

National Health Survey

Established in 1956, it is measuring levels, trends,
and social consequences of various illnesses.

Forrest E. Linder

When, in 1956, Congress authorized the establishment of the U.S. National Health Survey (1), the basis was laid for a major advance in the scientific measurement of the health characteristics of the nation's population. Before the Survey was established, the inadequacy of the existing heterogeneous sources of morbidity statistics was generally recognized, and for years numerous agencies and committees had analyzed the needs, had sought solutions to the technical problems involved, and had worked to give impetus to new efforts in this field. However, until the National Health Survey Act was approved, the resources for sustained research were generally lacking.

The previously available sources of data on the extent and characteristics of illness were largely limited to the reporting by physicians of selected communicable diseases, a number of specialized and local one-time health studies and surveys, and scattered and disparate reports from hospitals, clinics, and health or hospital insurance groups. Whatever the quality and adequacy of these individual sources might be, their *ad hoc* and various character provided no basis for constructing a uniform and valid nation-wide measure of the essential features of the health of the American people. A single exception in the field of health statistics was the factual information relating to mortality. In this field the legal requirements for controlling the disposition of bodies and the many needs for legal proof of death resulted in the early establishment, in every state, of a system requiring the medical certification and official registration of every death. This death registration system has provided the data for an annual series of detailed, comparable, and nation-wide

mortality statistics extending back for many years. These mortality data serve many scientific and administrative purposes in the medical, demographic, and actuarial fields, but the limitations of mortality data as an index of the health of the living population are obvious. However, in the absence of equally systematic and universal morbidity statistics, they have perhaps had a necessarily predominant weight in influencing the distribution of medical research and public health activities.

The usefulness of general morbidity data should require little emphasis, since numerous examples of the need for health facts are readily at hand. The direct private expenditures for medical care and for voluntary health insurance are estimated to exceed over \$12 billion per year (2). It is not necessary to estimate individually the additional resources devoted to health in the form of such items as medical research, and the expenditures of national, state, and local governmental and nongovernmental health agencies, to make the point that health activities involve an important proportion of the country's material and human resources. Perhaps the remarkable feature is that this sector of the national economic and social life has not, long before this, been the subject of the kind of systematic statistical measurements that are so generally available for other sectors, such as agriculture, income, finance, prices, manufacturing, foreign trade, employment, labor, and population.

The primary users of generalized morbidity data are, of course, those persons responsible for the direction of operating health agencies. To them, an accurate appraisal of the extent and character of disease and of the social and economic factors related to morbidity is essential for effective planning and evaluation of their programs and for altering the scope

and balance of their work. Originally concerned primarily with the control of the infectious diseases, the public and private health agency is now concerned with a much broader range of conditions. The factual basis for such work should be correspondingly broadened beyond the minimum figures on the incidence of those diseases, the reporting of which is required by law.

In a somewhat similar manner, morbidity statistics are needed for the planning and management of various aspects of social security programs, since total benefit payments for unemployment and disability are related in part to the volume and nature of illness and are affected by morbidity trends.

In a more tangential way such statistics have a contribution to make in the field of medical research, since clues to the etiology and pathogenesis of disease can often emerge from the study of the association between the incidence or prevalence of disease and various demographic, social, and geographic factors.

Of rapidly increasing importance are the direct economic applications of morbidity statistics. Some of these applications relate to improved evaluation of manpower resources, either for civilian or defense purposes. More generally, the economic loss of productive capacity through various types of morbidity is now recognized as an important and variable economic factor. The more stable component of this loss, which is attributable to chronic diseases or impairments, defines the magnitude of the need for rehabilitation of workers.

In another economic application, morbidity statistics related to demographic factors form the actuarial cornerstone for the development of voluntary hospital and medical insurance plans. As such plans increase in number and scope, health data covering all segments of the population become indispensable. Closely related to these uses of health statistics are the interests of drug and appliance manufacturers in estimating potential markets for new products and the use of such statistics for general guidance in market analysis and production scheduling.

Other countries have uses for morbidity statistics parallel to those in the United States, but the applications of health statistics extend beyond those that are strictly internal to questions of international health, particularly to the problems of evaluating international work directed to the economic and social development of the newly developing

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countries of the world. Both the United Nations and the World Health Organization have given attention to the methodological and conceptual problems of the statistical measurement of "levels of living" for the purposes of making international comparisons between countries or measuring change from one time to another. The measurement of the health component of the level of living is a part of this broader problem (3).

Morbidity Measurement Problem

The relatively slow development of the statistics of morbidity in the face of so many important uses for health statistics can be ascribed to the stubbornly complicated technical problems involved. Many of the problems of compilation are not peculiar to the field of health statistics, but in this field the problem of measurement is unusually difficult. In many statistical fields the unit of observation is fairly well defined and a limited number of specific uses for the data prescribe the character of the data desired in tabulation. In the field of health or morbidity statistics, the variety of uses of data becomes, itself, a complicating factor, since the group of phenomena to be observed have a multitude of aspects.

Referring again to mortality statistics, the fact of death is a clearly defined event, occurring only once for each person and at a closely determinable point in time. For morbidity none of these simplifying conditions exist. The concepts of health and illness are concepts that do not easily lend themselves to objective measurement. In morbidity statistics, according to the problem to be studied, the unit of observation may be the ill person, the morbid condition, the episode of illness, the medical service or treatment, or some other defined unit. Any of these units may be examined from differing points of view. For example, morbid conditions may be studied from the point of view of their prevalence at any given time or the incidence of new cases over a stated period of time. Illness itself is more often than not some indeterminate point on a continuous scale of well-being, from the best of health to severe sickness. In most instances, especially in chronic disease, the time of the onset and the end of the condition may be difficult or impossible to fix.

Even if the event to be statistically counted could be clearly defined and identified, it could be classified according to a large number of attributes. A

morbid condition, for example, could be classified according to type in a number of ways, such as whether it is new, old, acute, or chronic; what the nature of the condition is; what the prognosis is; and so on. The condition could also be classified according to various measures of severity, duration, kind and amount of care received or required, consequences to the individual's family or to the community, and various other criteria. Each of the possible units of tabulation and each of the various axes of classification may provide the statistic required for some important application of the data.

The variety of types of data is paralleled by the variety of sources from which morbidity statistics of the different kinds can be obtained. These complicate organizational arrangements needed for the collection of data and introduce a bewildering variety of problems of data collection. A recent International Conference on Morbidity Statistics, called by the World Health Organization (4), considered more than twenty-four different major possible sources of morbidity statistics. The population and morbidity coverage and the uses and applicability of data from each of these sources were studied, but the problems in compilation are largely unsolved.

Even if interest were restricted to a single type of data from a single type of source, the technical and administrative problems of compiling national health data would be difficult because of the geographically diffuse character of the events to be studied. While this difficulty is not unique for health statistics, the situation in medicine may be contrasted with that in some other fields. Foreign trade statistics are derived from shipping documents which are administratively collected in a small number of export or import points. Manufacturing statistics are based on the reports of a limited number of manufacturers of a given product. Financial statistics derive directly from the operating records of banking and exchange institutions. The collection problems in such cases are relatively simple. In contrast, medical activities originate in the illnesses of millions of scattered people and operate through a complex system of thousands of independent physicians, clinics, hospitals, and other health care facilities. At no one point do the kaleidoscopic facts of these various health activities exist in comparable form, nor are they brought together in any automatic way to permit ready statistical observation.

There is perhaps another fundamental

problem in the compilation of meaningful health statistics. This arises from the fact that statistical measures of health or morbidity take on their scientific meanings, as contrasted with certain administrative applications, only when they can be expressed as proportions or rates. It is not sufficient to know, for example, that at a given time so many people of such-and-such a population group are ill with such-and-such a disease. The important meaning of this aggregate figure emerges only when it is expressed in relation to the number of persons of the same population group who at the same time do not have the disease. Thus the collection of data on sick people by condition, age, sex, occupation, area of residence, and so on, must be accompanied by a parallel collection of corresponding data for the population as a whole, sick and well. Partly for this reason the compilations of statistics based solely on records of hospitals, clinics, or medical practitioners give only part of the needed information and, by themselves, are relatively meaningless, except as statistics on volume of medical services for certain administrative uses.

Program of the U.S. National Health Survey

The varied nature of the data desired for planning and evaluation in all phases of public and private health work and the requirement that corresponding information be obtained for both the ill and the well population determine the main lines of the policy and content of the program of the U.S. National Health Survey. The Survey is not a single survey, with a single method and a single limited objective. The Survey, as established by Congress, is intended to be an intensive and sustained attempt to solve the major problems of compilation of morbidity statistics, with due attention given to the development of new methods. The Survey is a program of surveys, which use different approaches and have different end objectives as both the techniques and the needs for data evolve. But basic to all of the present and future surveys is the fundamental idea that the data collection must pertain to a representative group of people as the only source where all of the desired facts converge.

At its present stage of development the Survey program has three major aspects. The first is the continuing nationwide Household Interview Health Sur-

vey. This survey, in which data are collected by means of skilled interviews with household respondents, is designed to give continuous information on the total volume of illness and disability, the medical care received, the nature of the medical conditions involved (to the extent that this can be obtained by the interview method), and various related demographic, social, and economic variables.

The second aspect of the program consists of other surveys, continuing or special in character, which are designed to obtain types of data not readily obtainable from the household survey. In view of the fact that the type of clinical information obtained by means of the household interview technique is not adequate for many medical research purposes, a nation-wide Health Examination Survey is now in the planning and testing stages. This survey will offer to a representative sample of the population a specially designed physical and clinical examination and will have as its objective a systematic inventory of specified clinical disease entities and the compilation of the frequency distributions of physical, and physiological, variables. The Health Examination Survey will give data expressed in precise medical terms, but because of the cost and the difficult logistic problems of this survey, the sample will necessarily be small, with the consequence that this survey will not yield the useful material relative to the social and economic aspects of illness and health that is obtained through the more extensive household interview survey. The difference between the methods and objectives of these two surveys illustrates the point that a single survey cannot serve all objectives. The special survey aspect of the program will successively develop other types of surveys as the program continues.

The third aspect of the program relates to studies of the methodology. Study of the pertinent methodology may be assumed in any scientific program, but special mention should be made of this part of the program. In the first place, a systematic development of the field of health statistics is so new that established and proven methods do not yet exist. For this reason the study of methods must occupy a prominent part in the Survey program. It is notable that the need for methodological work was recognized in the legislation creating the U.S. National Health Survey and that such research was specifically authorized. Methodological studies now under way

are of several types. One type of study has as its objective the identification of gaps in data collected by the household survey. Other studies are preliminary to the design and execution of special surveys. For example, a number of studies are now under way which are preliminary to the final plan for the proposed Health Examination Survey. Other methodological studies have as their objective the evaluation and calibration of the data to be published from the various surveys.

Operating Plan of Household Interview Health Survey

In less than twelve months after the U.S. National Health Survey was authorized by Congress, the Household Interview Health Survey was operating on a nation-wide, continuing basis. The speed with which this survey could be established on a regular basis was due to two factors. In the first place, arrangements were made for utilizing the staff and facilities of the U.S. Bureau of the Census in many phases of survey design and administration; thus, advantage was taken of the pioneering work and experience of that agency in practical methods of population sampling and surveying. Under these arrangements, the field operations for the household survey are performed by the Bureau of the Census under general specifications established by the Public Health Service. In accordance with these specifications, the Bureau of the Census designs and selects the sample; conducts the field interviewing, acting as collecting agency for the Public Health Service; and edits and codes the questionnaires. Most of the editing, and the tabulating, are handled on the Bureau of the Census electronic computers.

Secondly, activities in the field of household health surveys were further advanced than were those in most surveys to determine other types of health statistics, and there was considerable previous survey experience, both in the United States and in other countries, which could be drawn upon in the design of the new U.S. Survey.

The first attempts by the United States Government to obtain data on illness directly from the persons concerned were in the population censuses of 1880 and 1890. These early nation-wide efforts to collect data on illness were followed somewhat later by a great variety of inquiries which were confined largely to special groups of people, single local

areas, or special types of illness. These scattered studies provided no source from which an aggregate picture of the nation's health could be judged, but they did provide experience with different technical methods and demonstrated that the interview method could provide useful information about the amount and distribution of illness, the circumstances of injury, the loss of time from work or other usual activities resulting from disease and injury, and the utilization of medical care.

The next effort to obtain comprehensive data on illness in the general population was the National Health Survey of 1935-36 (5), a large-scale undertaking in which interviewers visited over 700,000 urban households to find out which members of the household had experienced disabling illness and which had specified chronic diseases or impairments. In the years since this 1935-36 survey, its findings have formed the basis for more than 200 reports, articles, and comparative studies.

Under a variety of sponsors, a number of additional studies were conducted after 1936 to provide large cities and states with needed statistics. Among the more important of these were the survey of the Eastern Health District of Baltimore (1938-1943); a methodological survey in San Jose, California (1952); the household survey initiated by the Health Insurance Plan of Greater New York (1952); the Baltimore Study (1952-55); the Hunterdon County Study (1951-55); and the state-wide California Health Survey (1954-55).

Surveys based on household interviews were also being organized in other countries. The Survey of Sickness in England and Wales was instituted in 1943 and continued until 1952 (6). Canada carried on a nation-wide sample survey for a 12-month period, starting in 1950, and Denmark organized a three-year survey program in 1951.

In designing the new U.S. Survey, an attempt was made to draw elements from this prior work, but there are many innovations in concept and in the statistical plan. In common with previous surveys, the Household Interview Health Survey rests on respondents within the household, inasmuch as this is the only source where the full range of facts about illness, good health, the person's demographic, social, and economic characteristics, the type of care sought or obtained, and the individual or family consequences of illness can be ascertained. The survey thus depends on a direct face-to-

face interview with some responsible person in a position to know the major health facts which are sought. For each household selected for interview, interviews are conducted with each adult member of the household, with proxy respondents permitted only for children or absent adults if related to the respondent. The present design does not provide for a reinterview at a later date, to collect follow-up information; hence, each selected household is interviewed only once (7). Questions are asked about the present health status of members of the household and about health experience during a retrospective period. This retrospective period varies for different items on the questionnaire but is generally a short period in order that errors due to failure of memory on the part of respondents may be minimized.

A very important feature of the survey plan is that the interviewing proceeds continuously, data being collected each week throughout the year. This continuous survey process has various advantages. Since data are collected each week, it is possible to compile weekly, monthly, or quarterly indexes of the various aspects of health to measure seasonal variation or time trends. However, many of the facts to be studied are the more fundamental relations between health and other factors, and the continuous collection of data permits the accumulation of information and, thus, successively more detailed tabulation and cross-tabulation. The continuous character of the survey also has administrative and technical advantages. For example, it is possible to use a smaller number of regular interviewers, who can receive constant training and retraining.

The corps of interviewers consists of approximately 130 permanent part-time employees who are trained and directed by 17 full-time supervisors located in Bureau of the Census regional offices. Training and checking of the interviewers' work is done through periodic group training sessions, assignment of homework, a systematic program of reinterviews by the supervisors, and a system of continuous flow of written instructions, performance evaluations, and reports on specific errors noted in interview technique.

The interview itself is based on a printed questionnaire and is "structured" in the sense that specified questions are asked in an exactly specified manner and order. The function of the interviewer is to follow the procedure according to in-

structions and to record accurately the replies of respondents. The interviewers learn how to ask the questions and how to record the replies. Their responsibilities are to act as reporters of facts rather than to attempt to be lay diagnosticians of the household ailments.

The questionnaire in use during the first survey year (July 1957-June 1958) consists of the following major parts or sections:

1) *Administrative items*: location and identification of household, record of calls, reasons for noninterview, editing control record, and so on.

2) *Demographic items*: identification of each member of household, relation to household head, age, sex, marital status, education, work status, and so on.

3) *Illness probe questions*: questions designed to aid the respondent's memory in reporting any current illness, injury, or impairment.

4) *Detailed information on illnesses, injuries, or impairments*: information on precise character of illness, medical care received, amount of disability, bed disability, work or school days lost, and so on.

5) *Hospitalization probe questions*: questions to aid respondent's memory in reporting episodes of hospitalization.

6) *Detailed information on hospitalization*: information on hospital admission, reason for admission, operations performed, name of hospital, and so on.

7) *Accidents and injuries*: date and class of event leading to injury, and so on.

8) *Medical care*: utilization of services of physician, place of visit, type of service, and so on.

9) *Dental care*: utilization of dental services, type of service, and so on.

The sample plan for the Household Interview Health Survey is designed in accordance with certain general specifications for sampling accuracy for national totals and for tabulations for various regional areas. The design is a complicated multistage plan, the main elements of which can be described in a few words by omitting procedural details. The plan follows in many respects that previously developed by the Bureau of the Census for its Current Population Survey. Initially, the 3103 counties and independent cities of the United States were grouped into about 1900 "primary sampling units" in a manner to form units of a single county or a group of contiguous counties of maximum internal heterogeneity and such that they

Table 1. Size of samples in different categories on which surveys covering different time periods are based.

Category	Period covered by survey		
	1 year	1 quarter	1 week
Persons	115,000	29,000	2,200
Households	36,000	9,000	700
Segments	6,000	1,500	115
Primary sampling units	372	372	~ 60

could be covered efficiently by a single interviewer. These 1900 sampling units were then classified into 372 strata, as required by the tabulating specifications, and according to a number of factors, including the rate of population growth between 1940 and 1950, degree of urbanization, principal type of industry, type of farming, and various demographic characteristics. From each of these 372 strata a single sampling unit was selected with probability proportionate to its 1950 population. These 372 sampling units form the first stage of the multistage sampling design used for the Household Survey; they are scattered throughout the United States, with at least one unit in every state.

Within each primary sampling unit, ultimate stage sampling units, called "segments," are identified geographically in such a manner that each segment contains an expected six households in the sample. Each week a random sample of about 120 segments is drawn, and the approximately 700 households, containing approximately 2200 persons, included in these segments are interviewed. The continuing collection of information is consequently based on samples of the sizes shown in Table 1 for different time periods.

Each statistic produced by the survey—for example, the number of persons with one or more bed-days of disability in a specified period—is the result of two stages of ratio estimation. In the first of these, the ratio factor is 1950 decennial population count to estimated population for 1950 for the first-stage sample of primary sampling units. These factors are applied for 132 color-residence classes.

Later, ratios of the sample-produced national estimates of the population to official Bureau of the Census figures for current population in 76 age-sex-color classes are computed and serve as second-stage factors for ratio estimating.

The effect of the ratio-estimating process is to make the sample more closely representative of the population by age, sex, color, and residence, thus reducing sampling variance.

As noted, each week's sample represents the population living during that week and characteristics of that population. Consolidation of samples over a time period, say a calendar quarter, produces estimates of average characteristics of the United States population for that calendar quarter.

Flexibility of Operation

The sample plan and the questionnaire scheme make possible a flexibility of operation in several respects. The continuous character of the data collection allows flexibility with regard to content, since the plan permits either a major change in the main questionnaire content at any time or a gradual evaluation of its content or technique. The survey can thus be made responsive to changing areas of health interest and can be technically improved as survey methodology is gradually perfected. In addition, the questionnaire plan permits the addition of a series of *ad hoc* supplements to the basic questionnaire to provide relatively quick answers on types of questions which require no more than one or two quarters of information for adequately accurate answers.

Flexibility can be obtained also in another respect—namely, with regard to time. The continuous succession of small weekly representative samples permits annual estimates for certain variables and relationships, quarterly estimates for statistics requiring less detail in tabulation, and even weekly estimates for certain totals where the frequencies are sufficiently high. The plan was not designed primarily for the making of such weekly estimates, but the recent influenza epidemic provided an opportune instance of the value of the survey in providing a current measure of the extent of disability from acute upper respiratory diseases.

Figure 1 (8) shows the two series of data relating to all acute upper respiratory diseases involving at least one day of bed disability. One series gives the weekly number of new cases of acute upper respiratory diseases (including influenza, pneumonia, and other similar conditions) involving one or more days of bed disability. The other series shows

the average number of persons in bed each day of the week because of these diseases.

Series such as these not only give a consistent national index of the level and trend of certain medical conditions but, in this case, gave a more adequate measure for the first time of the total significance to the economy of the country of what may be, individually, relatively minor illnesses. For example, during the four-month period September–December 1957, there were an estimated 100 million new cases of acute upper respiratory disease involving at least one day in bed. The number of different people involved was somewhat less, since during this period many persons had more than one case. Some measure of the total impact of these diseases during the four-month period is given by the estimate that they involved a total of 357 million person-days of bed disability. As it proceeds, the household survey will bring to light many such facts, which will provide new perspectives on the health of the nation.

Publication Plan

The publication plan for the Survey is designed for releasing data on each different topic as soon as sufficient data are accumulated. It is not intended that material will be held until a compre-

hensive, but necessarily delayed, general report is compiled. Under the plan, several series of topical reports are to be issued under the general title "Health Statistics—from the U.S. National Health Survey." Series A of these reports will deal primarily with methodological studies and will present information on the procedures used in the various surveys and technical evaluations of the information compiled. Series B will consist of reports presenting, topic by topic, the substantive results of the surveys. Major issues of Series B will be based on data collected during the first full year of the survey—namely, July 1957–June 1958. However, a number of preliminary reports are now being prepared relating to data for the first quarter (July–September 1957) or for material for the first two quarters (July–December 1957). The first of these preliminary reports (9) presents statistics on the volume of physician visits, by sex and age of patient, by urban-rural residence, by place of visit, and by type of service given. Data are also given, for the population of the United States, on the time interval since a physician was last consulted. Other preliminary reports now in preparation cover dental services, persons injured, hospitalization, acute conditions, and disability.

When sufficient data have been accumulated by the Household Interview

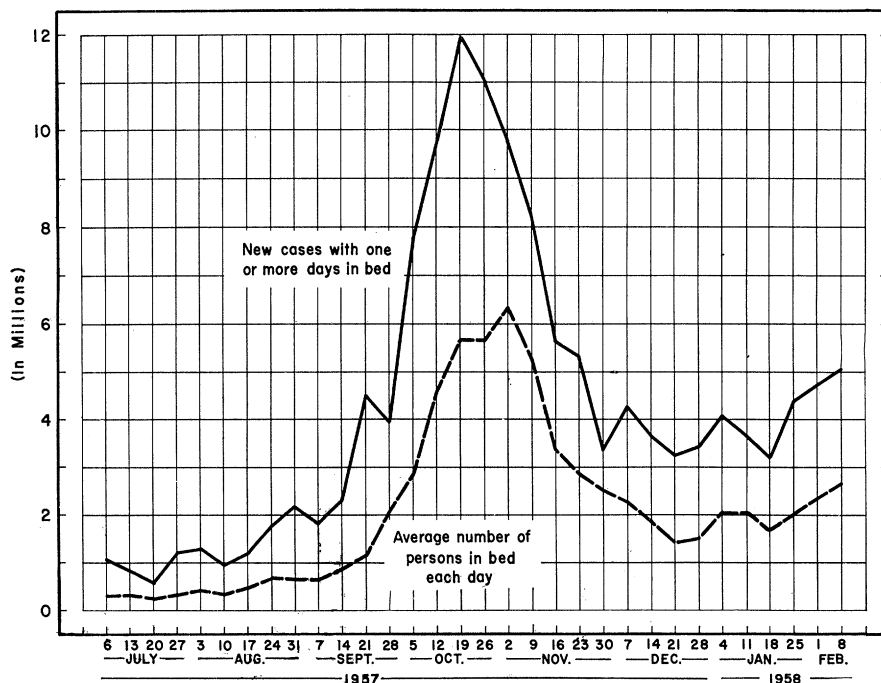


Fig. 1. Weekly estimates of the number of new cases involving one or more days of bed disability and the average number of persons in bed each day because of acute upper respiratory diseases, including influenza, pneumonia, and other similar conditions, in the United States, 6 July 1957–8 February 1958.

Health Survey, additional reports covering these and other topics will be prepared. These reports will give a wealth of new, detailed information relating these health items to various demographic and social variables. In a similar manner, the Health Examination Survey and other special surveys and studies will provide data for future tabulations, which will be published, topic by topic, when available.

References and Notes

1. Authorization for establishment of the U.S. National Health Survey was provided by the National Health Survey Act, Public Law 652, of the 84th Congress.
2. "Voluntary Health Insurance and Medical Care Costs, 1948-56," *Social Security Bull.* (Social Security Administration, December 1957).
3. "Measurement of Levels of Health," *World Health Organization Tech. Rept. Ser. No. 137* (Geneva, Switzerland, 1957).
4. *World Health Organization Tech. Rept. Ser. No. 53, 3rd Rept. of Expert Committee on Health Statistics* (Geneva, Switzerland, 1952).
5. "The National Health Survey 1935-36," *Public Health Bibliography Ser. No. 5* (Federal Security Agency, Washington, D.C., 1951).
6. "The Survey of Sickness 1943 to 1952," *Studies on Medical and Population Subjects No. 12* (General Register Office, London, 1957).
7. A regular program of reinterviews is a part of the plan, but these reinterviews are for control purposes and for the investigation of methodological questions.
8. These data have been published in a series of weekly reports: *Provisional Tabulation from the U.S. National Health Survey, Repts. No. 1-18*.
9. "Preliminary Report on Volume of Physician Visits, July-Sept. 1957," *Health Statistics Ser. B-1* (U.S. National Health Survey, February 1958).

News of Science

Translation Service Started by Special Libraries Center

The Special Libraries Association Translation Center, located at the John Crerar Library in Chicago, has announced that it can now furnish, on a subscription basis, printed catalog cards for current scientific and technical material which has been translated into English from all languages, including Russian. This latest effort of the center to facilitate the exchange and growth of scientific knowledge in the Western World will make available in easy-to-use, up-to-date card form the thousands of citations given in the center's bibliographical journal, *Translation Monthly*. Four types of subscriptions to translation catalog cards are available: (i) full coverage of *Translation Monthly* (approximately 12,000 titles yearly); (ii) coverage of all translations currently received by the center (approximately 6750 titles yearly); (iii) coverage of all Russian translations received by the center (approximately 3100 titles yearly); and (iv) coverage of all titles in specific subject fields.

Partially supported by grants from the National Science Foundation and the National Institutes of Health, the SLA Translation Center is a depository for unpublished scientific material which has been translated into English from all languages. It actively solicits and collects translations from government agencies, industry, technical societies, and educational institutions and makes copies of these translations available to other research groups and individuals. Users

may borrow paper copies of desired translations or may purchase for permanent retention microfilms or photoprints of translations.

The SLA Translation Center was established at the John Crerar Library in October 1953. In less than 5 years the original collection of 932 translations has increased to more than 20,000 items, and approximately 6750 titles are being added annually. At the request of the National Science Foundation, the SLA Translation Center took over, in January 1958, the Russian translations then housed in the Scientific Translations Center at the Library of Congress. This added 4000 Russian items to the collection, and since then Russian material has been received regularly—about 3000 titles a year—as have translations from all other languages. Further information about the SLA Translation Center and its services may be obtained from: SLA Translation Center, John Crerar Library, 86 Randolph St., Chicago 1, Ill.

Science, Technology, and Individual Freedom

Harrison Brown, professor of geochemistry at California Institute of Technology and member of the National Academy of Sciences, was one of the featured speakers at the tenth annual conference of the National Civil Liberties Clearing House that was held recently in Washington. In his talk on "Science, Technology and Individual Freedom," he discussed both the necessity of individual freedom if science and scientists

are to develop their full potential and the effects that science and technology are having on individual freedom. He cited three constraints that present-day society has placed upon the scientist's freedom. One is the sources from which the researcher receives his funds. The second "stems from the fact that scientists are individualists. They cannot work to best advantage in an atmosphere which is filled with FBI investigations, loyalty checks, loyalty oaths, public condemnation of their fellow-scientists, pressures for conformity, and accusations such as those which have been aired from time to time by both state and national investigating committees of various sorts."

The third constraint "involves communication, which is the lifeblood of inquiry." The major factors inhibiting the free exchange of ideas among scientists today are the classification for security reasons of scientific work and the restrictions placed upon their movements. Classification, Brown declared, "greatly impedes work, and in this respect it actually lessens our security." The difficulty some scientists have had in obtaining passports is part of the communications problem; more serious are "our formidable restrictions" on scientists abroad in securing visas for entrance to this country, with the result that "most international conferences of scientists are held abroad." Brown stressed the dangers implicit in our increasingly industrialized society and the need for recognizing and avoiding them.

"As our population grows, as our reserves of high-grade raw materials diminish in abundance, we will be faced with the necessity of bringing ever-higher levels of organization into our lives. There will be less living space and less opportunity for movement. There will be cries for more efficiency. . . . It is amply clear that man can in principle create a wonderful world—a world in which people can lead free and abundant lives. But I fear that so powerful are the forces which operate in favor of increased organization and integration that we ourselves may drift into a form of totalitarianism