body recover a state of health after medical treatment had been provided. The conclusion that can be drawn from this exposition is that the great public health achievements of the past 50 years are the result of the joint efforts of engineers, social workers, physicians, dentists, nurses, statisticians, epidemiologists, health educators, public health administrators, chemists, physicists, sanitary biologists and doubtless many others. Public health progress is emphatically not due to the activity of any one professional group.

Now that many of the communicable diseases have been brought under control by the methods described in the previous section, and such diseases as organic heart disease, cancer, nephritis, arterio-sclerosis, diabetes and other degenerative diseases have assumed increasing importance because of their high mortality, it is interesting to inquire how further public health progress is likely to be made. It is obvious that in so far as focal infections and communicable diseases are associated with the etiology of the degenerative diseases, their early discovery and elimination through expert medical service is of great value. Unfortunately, the degenerative diseases and cancer affect the population during the later adult periods of life and are apparently the result of physiological derangements of the human mechanism, the causes of which are still unknown. Early diagnosis and effective medical treatment in these degenerative diseases of later adult life may be palliative, but as yet they have not been successful in prolonging life to any appreciable degree. In order to accomplish this desirable end it is necessary to know how and why the degenerative diseases have their onset and to determine the best methods of prevention and control. Why does the body grow old and show the well-known symptoms of degeneracy and decay? What takes place within the body cells when senescence occurs? What keeps cancer in check during the early years of life in most cases and what occurs in the body later on in the very same human beings? The answers to these questions can not be found in the public health or hospital clinics. The answers must be found in the research laboratories, through the work of chemists, physicists, biochemists, organic chemists, bio-physicists, physiologists and other highly trained men in the various fields of science. In other words, further progress in prolonging the average life span of man at birth must depend on the significant contributions emerging from the various research laboratories.

At the present time, the evidence seems clear that those who reach the mature age of 80 years or more have usually come from long-lived parents. Such people seem to be able to overcome the hazards which are frequently fatal to those of shorter-lived ancestry. Heredity seems to play a far more important role in determining longevity than many of the factors normally regarded as significant. The effect of heredity on longevity is indicated by the data in Table 5.

TABLE 5

EFFECT OF PATERNAL HEREDITY ON LONGEVITY OF SONS[16]

Age of son at death, in years	Per cent. having fathers who died at age 80 or over
Under 20	24
20–39	21
40–59	27
60–79	38
Over 80	46

Great emphasis is being placed in the current public health campaign on the control of the genito-infectious diseases and pneumonia. Control, however, in these diseases is also based on the use of certain laboratory procedures for diagnosis, and on either chemo or sero therapy. It is apparent therefore that suitable control of the environment, including health education, also plays a rôle in the control even of these diseases.

The preceding analysis has brought out, I believe, the significance of the more effective control of the environment on the prevention of disease and premature mortality and on the prolongation of the average life span at birth. Coupled with a declining birth rate and with the restrictions that have been placed on immigration, the population of the United States has been growing older. This is evident from the larger proportion of the population now found in the later age groups. Older people must have and insist upon having a comfortable environment. Accordingly, the public health movement of the immediate future is destined to see greater emphasis on the comfort and convenience of man as well as a continuing emphasis on the prevention and control of disease. The former will undoubtedly include air conditioning, noise abatement, improved housing, smoke abatement, clean streets, parks and recreation centers, abatement of nuisances due to odors and unsightly conditions, stream purification and other items that fall within the realm of activity of the public health engineer. It would seem therefore that the importance of the public health engineer in organized community life is destined to increase rather than diminish.

SCIENTIFIC EVENTS

THE CONVERSAZIONE OF THE ROYAL SOCIETY

THE Royal Society held the first of its two annual conversaziones in its rooms at Burlington House, London, on May 24, when as usual a number of exhibits were displayed.

The London *Times* states that prominent among the

[16] *Ibid.*, p. 139.

exhibitors were various departments of the British Museum. Its department of zoology sent a series of armadillos, an example of camouflage in a nightjar and turtles stranded on the coasts of the British Isles; its department of geology flexible sponges of Oligocene age from Ukraine and casts of the skull and other parts of a large fossil amphibian from New South Wales; and its department of mineralogy a beautiful specimen of Danburite, a rare gem stone from Burma; while its research laboratory and department of ethnography illustrated the application of x-rays to the study of old Peruvian pottery.

From Kew Gardens came specimens showing the resupination of the flowers of laburnum and other plants, and the origin of the garden plum was illustrated by the John Innes Horticultural Institution. The National Physical Laboratory showed radio-transmitting equipment for use with meteorological sounding balloons, and an apparatus for measuring extremely minute differences in water pressure, and the Cavendish Laboratory, Cambridge, a new form of x-ray microscope which converts a series of measurements on x-ray beams diffracted by a crystal into an optical image of the crystal that can be viewed through an eyepiece.

Among exhibits from the Imperial College of Science and Technology were instruments for the microscopy of ores, a small internal-combustion engine running on methane and apparatus for measuring the oxygen consumption of flying insects and determining the effect of atmospheric pressure on the frequency of their wingbeat.

The director of research of the Admiralty demonstrated the rapid spectro-chemical analysis of alloy steels, and Dr. W. H. Hatfield, of the Brown-Firth Research Laboratories, showed non-magnetic steels and examples of different methods of obtaining extremely hard metallic materials. Sir Robert Hadfield showed a quick-immersion thermo-electric pyrometer for measuring the temperature of liquid steel and apparatus for the rapid estimation of carbon in steel.

Photographic exhibits sent by George H. Gabb included examples of early Talbotypes and Daguerreotypes, among them being what is probably the earliest attempt to photograph the solar spectrum, dating from 1842.

A CONFERENCE ON THE CALCULUS OF VARIATIONS

A CONFERENCE on the calculus of variations will be held at the University of Chicago from June 27 to 30 under the auspices of the department of mathematics. The speakers and the topics which will form the basis for discussion at the conference are as follows: Tibor Rado, of Ohio State University, "Length and Area" and "Geometrical Approach to the Plateau Problem"; Jesse Douglas, of the Institute for Advanced Study, "The Problem of Plateau-Riemann" and "Minimal Surfaces of Higher Topological Structure"; Marston Morse, of the Institute for Advanced Study, "Functional Topology and Analysis in the Large" and "The Existence of Minimal Surfaces of General Critical Type"; Karl Menger, of the University of Notre Dame, "Logical Analysis of the Semi-continuity Properties of Line Integrals"; E. J. McShane, of the University of Virginia, "Existence Theorems for Minima of Simple and of Multiple Integrals"; Max Coral, of Wayne University, "The Equations of Haar and the Differentiability of their Solutions"; G. A. Bliss, of the University of Chicago, "The Field Theory for Multiple Integrals"; L. M. Graves, of the University of Chicago, "The Jacobi Condition for Minima of Multiple Integrals"; M. R. Hestenes, of the University of Chicago, "The Problem of Bolza"; W. T. Reid, of the University of Chicago, "Sufficiency Proofs for the Calculus of Variations by Expansion Methods"; H. H. Goldstine, of the University of Chicago, "Minimum Problems of Abstract Functional Calculus." Discussion of some of the problems and results presented in the lectures of the conference will be continued in a seminar on the calculus of variations conducted by G. A. Bliss, and lasting through the summer quarter. Among those who will participate in the seminar are Max Coral, H. H. Goldstine, L. M. Graves, M. R. Hestenes, E. J. McShane, W. T. Reid and M. F. Smiley. A series of lectures preparatory to the addresses of the conference will be given in the seminar in the preceding week, from June 21 to 24. All mathematicians and other scientists who may be interested are cordially invited to attend the conference and the preparatory lectures in the seminar. Requests for information concerning the conference and housing accommodations may be addressed to Professor M. R. Hestenes, Eckhart Hall, University of Chicago.

L. M. GRAVES

THE ATLANTIC CITY MEETING OF THE AMERICAN SOCIETY FOR TESTING MATERIALS

THE forty-second annual meeting of the American Society for Testing Materials will be held at Chalfonte-Haddon Hall, Atlantic City, from June 26 to 30. There will be given upwards of a hundred and ten technical papers and reports in the fields of standardization, research and testing of engineering materials. The subject of the annual address of the president, T. G. Delbridge, manager of the research and development department of the Atlantic Refining Company, will be "Glimpses at Petroleum," and the fourteenth Edgar Marburg Lecture will be by Professor H. F. Moore, on "Stress, Strain and Structural Damage."