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THE AUTUMN GENERAL MEETING OF THE AMERICAN PHILOSOPHICAL SOCIETY, NOVEMBER 21-22, 1941

By Dr. EDWIN G. CONKLIN

VICE-PRESIDENT AND EXECUTIVE OFFICER

DURING the eighteenth and nineteenth centuries the meetings of the American Philosophical Society were held on the first and third Fridays of each month from October to May, inclusive, and the scientific programs consisted of a principal lecture and minor verbal or written communications from local members or distant correspondents. With the removal of residence of local members from the center of Philadelphia and the wider geographical distribution of the membership of the society it became increasingly difficult to get good attendance at these fortnightly meetings, and in the early years of the present century the regular meetings began to be held monthly, while an annual general meeting was held in the month of April extending over a period of two or three days. The success of these general meetings was so great and the interest in the monthly meetings so small that the latter were abandoned in 1935 and in their place an Autumn General Meeting in the month of November was instituted, to which there was soon added a Midwinter Meeting in the month of February, each of these extending over two full days. By thus decreas-

ing the number of meetings and increasing the length and importance of each the attendance and interest have greatly increased.

The Autumn General Meeting for 1941 was held in the Hall of the Society on Independence Square on November 21 and 22. About one hundred and ten (110) members and especially invited guests were present and registered in addition to an unknown number of persons who were present but did not register. The program of the first day of the meeting consisted of reports on the scientific results of the United States Antarctic Expedition of 1939–1941. In the main these were the first detailed reports of this latest expedition to Antarctica, which was probably better organized for scientific work than any previous expedition. Thanks are due to all who took part in this program, and especially to Dr. Serge A. Korff, who was largely responsible for its organization. Brief abstracts of these reports follow:

F. Alton Wade, senior scientist, U. S. Antarctic Service. An Introduction to the Symposium on Scientific Results of the United States Antarctic Expedition, 1939–41.

One of the primary purposes of the United States Antarctic Service Expedition, 1939–1941, was to carry on a comprehensive program of scientific observations and research. Through the cooperation of many of the world's leading scientists such a program was planned. A good portion of the program was carried to completion by the twenty-one members of the scientific staff. Due to extenuating circumstances and an unexpected termination of the expedition, some phases were only partially completed. Detailed observations were made and programs of research were conducted in the following fields: Auroral phenomena, bacteriology, botany, cosmic ray, glaciology, magnetism, medicine, meteorology, micropaleontology, ornithology, petrography and petrology, physiography, physiology, radio, seismology, structural geology and zoology. A few of the reports have been completed, others are nearing completion and some will not be ready for publication for months. In addition to the work as summarized in this symposium, there are to be published many more reports. Among them may be listed the following: Observations and height determinations of the Aurora Australis. The physiographic feature of the Ross Shelf Ice. The geology of the Weddell Coast of Palmer Peninsula south of 68°. The geological features and formations in the vicinity of East Base. The sedimentary rocks of the Edsel Ford Mountains. The petrography and structure of the Rockefeller Mountains. Ornithology Report; this will include observations of bird life at both bases, at the Melchior Islands and along the ships' routes. The petrography and structure of the Melchior Islands. A correlation of radio receiving and transmitting conditions with magnetic phenomena and auroral displays.

F. Alton Wade. The Physical Aspects of Shelf Ice.

The first detailed investigations of shelf ice were made at West Base during 1940. Included in the program were the following: the variation of the density of the firn with depth, sub-surface temperature measurements to a depth of forty-one meters, variations in the snow surface level over a period of eleven months, horizontal and vertical movements within the firn, variations in the size of the constituent grains in various zones, stratification and horizontal banding. The methods used are discussed and the apparatus is described. The results are presented in tabular and graphic forms. Comparisons are made with the results as obtained from investigations of the physical aspects of other types of glaciers; namely, valley glaciers and the Greenland Ice Cap. The lack of summer melt-water in the Ross Shelf Ice eliminated what had been considered the most important factor in the process of firnification. However, without the aid of melt-water the process does proceed with much the same results. An explanation of the firnification process in regions where the air temperature seldom rises above freezing is advanced.

Paul A. Siple, geographer and leader, West Base. Geographical Discoveries from West Base.

Geographical exploration was carried on from West Base in 1940 by means of five reconnaissance field parties and two aircraft. The routes used followed but extended considerably beyond those opened first by the Byrd Expeditions 1929 and 1934. The field parties' operations were limited to the hinter coastal mountains east of Little America from longitude 164° west to longitude 136° west. The parties were occupied mainly with surveying, geology, biology and meteorology. Aerial reconnaissance and surveying extended eastward to longitude 120° west including the major land features to nearly 200 miles south of the coast. This was accomplished by six flights making more than 1,000 usable aerial survey photographs available of the area. Exploration to the west of Little America included three major flights over previously explored portions of the Ross Ice Shelf crossing in each case into meridians of east longitude in the vicinity of latitude 78° 30′; 79° 20′; 81°; 83°; and 84°. Four newly discovered areas of internal disturbance were studied and 15 bays and inlets were photographed in the continuous aerial survey of about 400 miles of barrier face from an altitude of 7,000 feet. Southern exploratory operations were confined mainly to filling in the gap of mountains in the Austral Cordillera between Beardmore and Live Glaciers. However, the character of land formations east to the 120th meridian west indicated no sea level connections between the Ross and Weddell Seas. Other geographical accomplishments included glacial studies of the formation and physiography of shelf ice; problems of human adaptation to the climate of Antarctica and studies of the cooling power of the wind.

Lawrence A. Warner, Department of Geology, the Johns Hopkins University. Geological Structure and Petrography of the Edsel Ford Ranges, Marie Byrd Land, Antarctica.

The portion of the Edsel Ford Ranges investigation by the geological party of the U. S. Antarctic Expedition lies between longitudes 143° 30′ and 145° 30′ W and

latitudes 76° 50′ and 77° 15′ S and comprises a total area of about 700 square miles. The Raymond Fosdick Mountains, immediately to the north, were investigated by a party of biologists who submitted their geological notes and specimens for investigation. Thus, reconnaissance data are available for the major portion of the Edsel Ford Ranges. The oldest outcropping rocks in the area are slightly metamorphosed sediments which consist of a remarkably uniform series of dark shales and sandstones, the total thickness of which is at least 15,000 feet. Since no fossils were found, the geological age of the series is not known. The sediments are intruded by a granitic batholith, the major axis of which appears to run roughly N–S. The major sedimentary ranges comprise a broad syncline, the axis of which trends E–W and plunges down the west flank of the batholith. Exposed contacts between granite and sediments are for the most part sharp and concordant. Dikes and linear masses of igneous material, ranging in composition from alaskite to dolerite are intrusive into the granite and sediments. These are thought to represent differentiates of the granitic magma. The region as a whole is broken by faults, along one of which there is a horizontal displacement of over a thousand feet. The strikes of the dikes and faults appear to be symmetrical to the major structures in the granite and sediments. Of relatively recent origin are basaltic lava flows which seem to be confined to a small area in the Raymond Fosdick Mountains. The major geological problems of the area are concerned with: (1) The age of the sediments and the climatic and geographic conditions under which they were deposited. (2) The mode of emplacement of the igneous bodies and the relation of the intrusives to the deformation of the area. (3) The paucity of ore deposition and pegmatization. A critical analysis of the field evidence and detailed petrographic studies in the laboratory are now in progress in the hope of shedding light on these problems.

H. G. Dorsey, Jr., U. S. Weather Bureau. An Antarctic Mountain Weather Station.

The meteorological program at the East Base of the U. S. Antarctic Expedition was featured by the establishment of a completely equipped weather outpost over a mile above sea-level on the plateau of Palmer Peninsula. Early in August, 1940, a sledging party from East Base pioneered a route to the plateau, making an ascent which previous explorers considered inaccessible to dog teams, and indicating the possibility of erecting a mountain weather station. Late in October, nearly one and a half tons of equipment were transported by four dog teams to the proposed meteorological outpost, located at 68° 7′ S., 66° 30′ W. on a plateau knoll about 12 miles east of the main base. Lester Lherke, C.B.M., U.S.N., and Robert Palmer occupied the plateau weather station during November and December. Despite prevailing northeasterly storms of drifting snow, their days were well spent between living quarters in a sturdy tent and meteorological office in a snow cave. For the first time in South Polar regions, detailed high level weather data were obtained in a form suitable for comparison with nearby sea-level observations. Six-hourly check readings on all data were taken concurrently with those at East Base, in addition to the continuous autographic records of wind, pressure and temperature. Snow accretion and ablation were measured. Pilot balloon observations of the winds aloft were especially valuable when there was a low overcast below the plateau. The mountain station contacted the base twice daily by low power radio, sending coded weather reports, which were included in the East Base weather transmissions to South America. These data and frequent special reports were helpful in forecasting for aviation operations at East Base and provide interesting material for future research on the meteorological phenomena of Palmer Peninsula.

Roy G. Fitzsimmons, Physicist, Department of Terrestrial Magnetism, Carnegie Institution of Washington. Preliminary Report on the Magnetic and Seismic Program.

During the period from April 27, 1940, to January 21, 1941, a LaCour insensitive magnetograph was in operation at Little America. Variations of the declination and the horizontal and vertical components of the earth's magnetic field were recorded. Control observations were made with a magnetometer and a dip circle. A general description of the magnetic observatory and the method of observation as well as a report on the preliminary magnetic results were given. During the period from November 17, 1940, to December 28, 1940, a McComb-Romberg seismograph was in operation at the Rockefeller Mountains. A report of the earthquakes recorded and their analysis were given.

Serge A. Korff, assistant professor of physics, New York University. Report on Cosmic Ray Results.

The cosmic ray program of the U. S. Antarctic Service was planned with a view to throwing further light on the connections between cosmic rays and meteorology, and also on the effects produced by such high energy rays passing through matter. The first part of the program involved the operation of two meters at West Base over the Antarctic winter and a correlation of the records there obtained with temperature, pressure and other effects, such as magnetic variations, and also the operation of the instrument on board ship to obtain further data regarding the temperature coefficient and the latitude-variation. Finally, airplane flights to high altitudes were carried out, which were to be studied in connection with radiosonde data. The second part, namely, studying the effects produced by the radiation, involved (a) operating a cosmic-ray counter on shipboard for comparison with the electroscope data, (b) the operation of a neutron counter and (c) measurement of all bursts in the cosmic ray intensity on the long-term records. With respect to the first part, a pressure coefficient was determined from the data at West Base for each 15-day period of operation. It was found that the least-square solutions of the correlation between pressure and cosmic-ray intensity gave a slope (the pressure coefficient) and an intercept (the extrapolation of the cosmic ray intensity to zero pressure) both of which varied over somewhat wider limits than were anticipated. Further analysis showed that this variation was associated with changes in the light of the mesotron producing layer, but that contrary to the usual

procedure in temperature latitudes, this could not be represented as an external temperature-effect. This was found to be due to the fact that the surface temperature was not a good indicator of the distribution of the atmosphere in the column of air above the instrument. Using the radiosonde data, a new dependence upon upper atmosphere conditions was computed, and better agreement was obtained. This was checked by the runs made on shipboard in zones of different surface temperatures. It is a pleasure to acknowledge the excellent work done by Messrs. E. T. Clarke, D. K. Bailey and E. K. Smith in this connection.

Arnold Court, junior meteorologist, U. S. Weather Bureau. Disappearance of the Tropopause During the Antarctic Winter.

Complete disappearance of the tropopause above Little America III is revealed by the 190 radiosonde observations made from April 25, 1940, to January 15, 1941, as part of the U. S. Weather Bureau's share in the scientific program of the U. S. Antarctic Service. Summertime observations show a definite and rather warm (−50° C) tropopause around 9 km, above which the stratosphere is −40° C or warmer. Spring and fall soundings clearly show the transition from the winter type, with no clearly defined stratosphere and with temperatures to −80° C, to the summer condition. This hitherto unsuspected behavior of the upper air apparently is due to seasonal differences in radiation, but no indications of such conditions have so far been reported in the northern hemisphere, despite daily soundings at Barrow, Nome, Fairbanks and other Alaskan stations, and intensive work in Russia and Scandinavia. None of these stations, however, is as close to the pole as Little America III (800 miles). Another phase of the meteorological program, the making of 230 pilot balloon ascents, revealed the prevailing summertime wind at high levels to be southwest or west-southwest, not northwest as had previously been assumed. On the surface, observations covering an entire year were obtained, 11 months of them on a complete 4-a-day basis. Barograms were obtained in duplicate for the entire time, and thermograms except when winter cold stopped clocks. Complete wind records minute by minute were obtained from April 10 to camp abandonment on February 1.

Herwil M. Bryant, Naval Research Laboratory, Anacostia Station. Biology at East Base.

The East Base of the U. S. Antarctic Service is well situated for biological study. Stonington Island, the base of operations, lies just a hundred statute miles within the Antarctic Circle on the west coast of the Palmer Peninsula. Here great glaciers flow down to the sea between high mountains. Precipitous cliffs, many too steep to hold snow, form the shore line. Although frozen-over eleven months of the year, the relatively shallow waters along the coast are rich in marine life, attracting penguin and seal alike. During summer months sea birds are attracted to this feeding ground; some breed on the rocky shore. Two Adelie penguins' rookeries were within sledging distance of the base. Rocks exposed on the steep cliffs were often encrusted with lichens, while thawing weather during the short summer period formed small pools of fresh water, often teeming with aquatic life. The collection of a completely representative set of specimens representing this region was a primary consideration. The U. S. National Museum has received all specimens brought back. At the present time these are undergoing exhaustive classification and investigation. In the field, a thorough study of the breeding Adelie penguin was made. Carl R. Eklund, ornithologist and assistant biologist, made studies on the body temperatures of Antarctic birds. New southern records were recorded for sub-Antarctic species such as the blue-eyed shag (*Phalacrocorax atriceps*), and the breeding southern black-backed gull (*Larus dominicanus*). Of special interest were notes on Collembola colonies and the discovery of certain mites living upon lichens, algae and mosses. At East Base, the first representative West Antarctica biological collection was prepared for an American institution and a general biological picture of this unknown region, adding to the work of Bertram and Roberts of the British Graham Land Expedition (1935–1937), was recorded.

Ernest E. Lockhart, physiologist, Massachusetts Institute of Technology. Acclimatization in the Antarctic.

An attack on the problem of acclimatization by white men in the Antarctic was made by studying the effect of sudden changes in temperature on blood pressure, heart rate and respiration rate. This work was extended with data on typical body temperature, blood pressure, heart and respiration rates and metabolism under basal conditions. A study of blood sugar levels was also made. The results of these studies may be summarized as follows: Although pulse pressure is not affected significantly, systolic and diastolic pressures increase 25 to 35 per cent. when a sudden change in temperature is the stimulus. Both the respiration rate and the heart rate are decreased somewhat. Under typical basal conditions pulse and respiration rates, blood pressure and body temperature are slightly lower than normals recorded in temperate climates. Basal metabolism averages 10 to 15 per cent. lower than that reported for temperate climates. Blood sugar levels, on the other hand, are slightly above the normal limit of 120 mg per cent. Although the results presented should be extended, those now at hand indicate that an acclimatization does take place in white men when subjected to the extreme conditions prevalent in the Antarctic. It is suggested that the acclimatization process is begun by the continual pressor action of the low temperature. This primary stimulus, when repeated frequently, as is the case, induces hypo-effects in the several endocrine systems principally involved in metabolism.

The Friday evening lecture was given by Vilhjalmur Stefansson on "Military Aspects of the Arctic," and was an able and timely contribution to this important subject.

The program on Saturday morning consisted of ten papers, eight of them being from recipients of grants from the research funds of the society. The chief results of these researches are given in the following brief abstracts:

Lester W. Strock, geochemist, Saratoga Springs Laboratory. The Geochemical Genesis of Saratoga Mineral Waters and the Spectrochemical Analysis of Their Characteristic Trace Elements.

The more abundant constituents of the mineral waters occurring at Saratoga Springs, N. Y., have been traced to four geochemically distinct sources. These sources, listed in the order in which the parent ground waters obtain their materials from them, are: (1) the "Camillus" lime mud rock of the central New York Silurian formations which furnish the potassium and bromides and which has been interpreted in this work as a "bittern shale"; (2) the rock salt beds of the same Silurian formations which supply the chlorides and most of sodium; (3) older shales and limestones underlying the salt beds from which some additional sodium, all the iodides, a very small portion of the potassium, and about half the calcium is obtained; and (4) the Little Falls dolomite which furnishes the other half of the calcium and nearly all the magnesium present in the Saratoga waters. The synthesis of Saratoga mineral waters in these four distinct stages progresses as the parent ground waters move in a general eastward and later northeastward direction toward the Saratoga region from central New York. During a large portion of their course they are confined in the Little Falls dolomite, in which they are trapped in the Schenectady basin. Their further movement eastward is blocked by a buried crystalline ridge, so that they are forced upgrade toward Saratoga by the pressure of new waters from the west. Quantitative spectrochemical determinations are being made of the lesser abundant elements in Saratoga waters, and all typical rocks of the geological formations involved in the above proposed theory of their origin. The elements zirconium and tin are strongly enriched in the waters. Beryllium is enriched to a smaller extent, while manganese, cobalt and nickel are strongly depleted. Iron has been used as an empirical abundance standard and the abundance ratios for the waters compared with similar ones for the earth's silicate crust. The several thousand-fold enrichment of zirconium over titanium in Saratoga water, compared with the known ratio of these two elements in the earth's crust, is proof of the exceptional geochemical properties of these saline-bicarbonate-rich mineral waters. This discovery has served as an additional incentive to search for new geochemical processes in nature by a spectrochemical analysis of the trace elements occurring in solution in all parts of the earth's hydrosphere.

Carl G. Vinson, professor of horticulture, University of Missouri. Isolation of Crystalline Tobacco Mosaic Virus Protein Using Water Miscible Solvents.

A modified method has been developed for isolating tobacco mosaic virus from juice of diseased plants. In this method a strong acid-phosphate buffer solution is used as the precipitating agent. There is no danger of inactivating the virus due to extremes of hydrogen ion concentration. Crystalline form of many substances often is determined by the character of the dispersions medium. No true crystals of the virus of tobacco mosaic have been obtained, however, from any of a large number of organic substances, miscible with water, when used in forcing the virus out of an aqueous dispersion. Acetonyl acetone has been found superior to ether in removing the pigment associated with the virus in juice of diseased plants.

Leslie A. Chambers and Werner Henle, Johnson Foundation, University of Pennsylvania. Concentration, Isolation and Determination of the Size of the Virus of Influenza A.

The infectious agent of influenza A, as it occurs in emulsions of infected mouse lung, is associated with particles about 100 mμ in diameter. Particles of similar size, chemical composition, density, staining properties and electron-microscopic appearance are derivable from normal lung tissue. Virus contained in the extra-embryonic fluids of infected chick embryos is not associated with such large structures, but may be absorbed completely from such fluids by the particles derived from normal lung tissue. This, together with other evidence, indicates that a component of normal cells may act as carrier of a considerably smaller pathogenic agent. Concentration of the virus from extra-embryonic fluids was accomplished by precipitation with protamine. Analysis of the resulting infectious complex indicates that the virus consists largely, if not entirely, of nucleoprotein. Ultra-centrifugation at about 90,000 g for 90 minutes sedimented amost all the infective material from egg fluids. Sedimentation diagrams of the resuspended sediment showed two components to be present. One of these gave a well-defined boundary and had a sedimentation constant of 31×10^{-13} corresponding with a particle size of about 12–14 mμ and a molecular weight of about 1,000,000. Fractionation by ultra-centrifugation, followed by protein analysis and infectivity tests, indicated than the heavier, less homogeneous component (S_{20} = about $800 \pm 100 \times 10^{-13}$) consisted, almost entirely, of aggregates of the smaller units. The two sedimentable fractions were infectious in approximately equal dilutions. A minimal infectious dose contained about 10^{-16} grams and therefore consisted of less than 100 particles. A size distribution curve based on measurement of electron-micrographs of the isolated virus protein showed the particles to be essentially spherical and to have a modal diameter of about 11 mμ. This is in good agreement with the estimates based on the sedimentation constant $S_{20} = 31 \times 10^{-13}$. In view of this evidence the virus of influenza A must be regarded as one of the smallest pathogenic agents yet isolated.

Herbert Shapiro, Department of Physiology, Hahnemann Medical College, Philadelphia. The Parthenogenetic Activation of Rabbit Eggs in the Unoperated Animal.

It has been shown in earlier work that cold is an effective agent in initiating artificial parthenogenesis in rabbit ova, *in vitro*. By inducing rabbits to ovulate as the result of a course of pituitary extract injections, tubal eggs of known age could be cooled *in situ* in the anesthetized animal, under sterile surgical conditions, by circulating cold water through a metal jacket into which the tube

was inserted. This mode of treatment did in one instance lead to the birth of a normal parthenogenetic female, capable of normal reproduction, which at this writing, months later, is still living. In the present series of experiments, rabbit eggs were activated parthenogenetically in the intact animal, without operating surgically. Rabbits were made to ovulate as usual by pituitary injections. Cooling of the entire animal was effected by applying an ice pack to the doe's flank, directly over the region of the Fallopian tube, as she lay anesthetized on the table. Rectal temperature, respiration and pulse rate were recorded at regular intervals. The uterine tube, which lies just under the abdominal musculature, was very likely brought to a temperature lower than that indicated by the rectal thermometer. Body temperature (normally about 39.7° C., in the rabbit) was lowered to points varying from 33.6° C. to 18.0° C. (92.5° F. to 64.4° F.). In all experiments, perfect recovery of the animals occurred. Eggs were secured at various intervals after the experiment by flushing the Fallopian tube, and they were then fixed and sectioned for microscopic study. Artificial parthenogenetic activation was obtained in two animals, one of which contained two eggs in two cell stage, when examined 40 hours after the activating treatment, and another contained a young embryo in the early morula stage. More advanced stages in embryogenesis have not thus far been obtained.

Francis Harper, research associate, the John Bartram Association, Philadelphia. William Bartram's Status as a Naturalist.

Bartram's accuracy and even his integrity have been occasionally questioned for more than a century. Among his critics have been J. E. LeConte (in 1830), J. A. Allen, F. W. True, T. G. Pearson, A. H. Howell and Remington Kellogg. His defenders have included William Baldwin, J. E. LeConte (in 1854, making handsome amends for his earlier criticism), Sir Charles Lyell, Elliott Coues and the present writer. Most of the criticism directed against Bartram has revolved about his accounts of the Alligator and the "Painted Vulture." Recent investigations have amply vindicated him on both points. To Bartram natural history was scarcely an exact science, but a study to be interpreted with something of a poet's vision. He was thus entitled to a little poetic license and occasionally availed himself of it. Now and then he seems to have trusted a faulty memory. He was frequently inaccurate in matters of dates, distances and dimensions. He lacked a proper training in taxonomy. But these shortcomings scarcely affect the general soundness and accuracy of his observations on plants, animals and Indians. There can be no question of his fundamental integrity as a naturalist. His "Travels" provides a priceless record of American natural history in the eighteenth century.

Helen C. Palmatary, Kensington High School, Philadelphia. Recent Archeological Studies in Amazonia.

In the summer of 1941 I went to Belém, Brazil, for the purpose of studying the Marajó pottery in the Museu Goeldi, also the private collection of Dr. Carlos Estevam, director of that museum. In addition to the museum work, I made a trip to Marajó Island accompanied by Dr. Carlos Estevam, and visited two important sites there—Pacoval, an artificial island in Lago Arary, where the ancient Indians buried their dead, and Santa Brigida, an important but little known site. Dr. Estevam did some excavating at the latter site. The section of the island from which the pottery comes is flat campo land, badly flooded for more than half the year; it has neither trees suitable for building material nor stone from which implements can be made. Brief references were made to some of the problems which present themselvs in connection with an effort to partially reconstruct the ancient culture or cultures of Marajó.

Charles Grosvenor Osgood, professor emeritus of English, Princeton University. The Variorum Edition of the Works of Edmund Spenser, Especially of the Minor Poems.

The Variorum Edition of the Works of Edmund Spenser, first proposed by the late Edwin Greenlaw, of the Johns Hopkins University, and carried on since his death by Dean Frederick M. Padelford, Ray Heffner and myself, has already published six volumes containing the *Faerie Queene* with full "variorum" apparatus. The present project, for which as special editor I am responsible, is the editing of the "Minor Poems" of Spenser. These will occupy two volumes larger than any yet issued. The first of these is in press, the second largely compiled, though not fully checked and revised. The work of a "Variorum" editor is twofold: (1) the preparation of a new text embodying all the help of preceding editors and a new collation of all the early editions; (2) the assembling, appraising, sifting, arranging and condensing of all relevant comment and lucubrations, and the addition of the editor's comment where it is called for. We trust that the text of the "Minor Poems" which we have established will become the definitive text. Certainly no other edition has included the examination of so many copies of the earliest editions. I have assembled and weighed all the widely scattered material I can find which will serve to elucidate the poet's meaning and the composition of the work.

Leonard G. Rowntree, chief, U. S. Medical Division, Selective Service. The Health of Registrants and the President's Plan of Rehabilitation.

Selective Service is charged with the function of procurement of men for the Army. More than 17,000,000 men have been registered to date and more than 2,000,000 have been examined. The average height of registrants examined is 67½ inches. This figure is identical with that obtained for the Army in World War I. The average weight of registrants is 150 pounds, which is 8 pounds heavier than the average for the men examined for the Army in the last war and 14 pounds more than the average for soldiers in the civil war. Selective Service examinations reveal that great differences exist in the health in various parts of the country. A "health belt" is found in a group of western states centering around Colorado. A somewhat similar belt of good health was found to exist

during the last war. The poorest physical state is encountered in some of the southern states. The difference in health in these areas is quite marked; thus for every 10 men examined in Colorado 7 are found acceptable, whereas in one of the southern states only 3 are acceptable. The physical fitness varies greatly with age. The average age of the registrants was 25.7 years. Of those 21 years of age, more than 60 per cent. were fit, whereas those 36 years of age less than 30 per cent. were fit. The Selective Service and Army boards have rejected as unfit for military service approximately 50 per cent. of the registrants examined. About 100,000 are rejected for illiteracy; 430,000 are totally unfit for military service, and 470,000 are classified as 1–B; that is they might be fit for limited military service were they acceptable under Army standards. These figures are not to be interpreted as representing 50 per cent. invalidism of the registrants examined, or as indicative of 50 per cent. illness of the population in general. They simply represent unfitness for military service according to the standard requirements that have been set up by the Army.

These cases of rejections are listed in Table 1.

Because of the relatively poor physical state of 50 per cent. of the registrants examined and the urgent need for manpower for national defense, the President has suggested that as many as possible of those rejected be rehabilitated. It is estimated that around 200,000 have remediable defects. This work of rehabilitation has been assigned to the Selective Service System. Plans have been formulated and the work is already under way. Rehabilitation is to be carried out in the registrant's home community. Funds are to be provided for the medical and dental services necessitated in the rehabilitation program.

TABLE I

Cause	No. of cases	Percentage
Dental defects	188,000	20.9
Defective eyes	123,000	13.7
Cardiovascular diseases	96,000	10.6
Musculo-skeletal defects	61,000	6.8
Venereal diseases	57,000	6.3
Mental and nervous diseases	57,000	6.3
Hernia	56,000	6.2
Defects of ears	41,000	4.6
Defects of feet	36,000	4.0
Defective lungs, including tuberculosis	26,000	2.9
Miscellaneous	159,000	17.7
Totals	**900,000**	**100.0**

OBITUARY

RUDOLF SCHOENHEIMER, 1898–1941

RUDOLF SCHOENHEIMER was born in Berlin, where he received his early education and university training. After receiving the medical degree from the University of Berlin in 1922, he held for a year the position of resident pathologist in the Moabit Hospital of that city. There his interest was attracted by the problem of atherosclerosis and his first published works, dating from that period, relate to the production of this condition in experimental animals by the administration of cholesterol. Recognizing his need for a wider knowledge of biochemistry, he then studied for three years under Karl Thomas of Leipzig, from whose laboratory he published, early in 1926, an ingenious method for the preparation of peptides. During these years of supplementary training, Schoenheimer held a fellowship of the Rockefeller Foundation.

The next move was to the Pathological Institute of the University of Freiburg, where in 1926 he joined, as chemist, the staff of Ludwig Aschoff, who exerted a marked influence on his scientific development. Here, along with his regular duties in the investigation of pathological material, he again took up the biochemical study of the sterols. In 1927 he became the active, and in 1931 the titular, head of his division. During this period his researches related mainly to the metabolism of cholesterol and were continued in this field when, in 1930, he came to this country for a year as Douglas Smith Fellow in the Department of Surgery of the University of Chicago. After his return to Freiburg in 1931 his work, continued with the support of the Josiah Macy Jr. Foundation, was rudely interrupted by political developments within Germany in the spring of 1933. The last study completed in the Freiburg laboratory was reported in the *Journal of Biological Chemistry*; it established the important finding that in the normal mammalian organism cholesterol is continually and extensively synthesized and degraded in the tissues.

The Department of Biochemistry of Columbia University was fortunate in being able to provide facilities for Schoenheimer's subsequent researches. The first report published by him from this laboratory, recording the normal occurrence of cetyl alcohol in intestinal contents, has a peculiar significance in its bearing on his subsequent work on the intermediary metabolism of fatty acids. In collaboration with W. M. Sperry, he developed a valuable method for the precise determination of minute quantities of free and combined cholesterol and applied this technique to a comparative study of serum and plasma.

In 1934 Schoenheimer made a new contact which proved to exert a fundamental influence on the nature of his work. In order to exploit the availability of deuterium, discovered by Urey in 1932, for the development of biological research, the Rockefeller Foundation established a fund to enable chemists trained in deuterium techniques to apply their special knowledge to biochemical and allied problems. Under these