useful compilation. This volume deals with that part of the theory of partial differential equations which is important in relation to physics. The book is written primarily from a mathematician's point of view, developing the subject of partial differential equations in a systematic way, and then proceeding with the application of the theory to the problems of physics. Among the physical problems discussed are heat conduction; plane waves, Huyghens' principle and the optics of crystals; the Hamilton-Jacobi equation; the telegraph equation; and potential theory and hydrodynamics. There is also a valuable section devoted to Heaviside's method of operators.

The last chapter deals with boundary and *eigenwert* problems from the point of view of variational calculations. There is an indication that the mathematical methods discussed here will be of importance in the future perturbation calculations of the quantum theory. One wonders whether the present volume will have the almost prophetic nature of Volume I, which dealt extensively with *eigenwert* problems three years before the advent of wave mechanics.

Although, for the most part, the applications to physics are in rather neglected and unfashionable fields, the book should be in the reference libraries of all physical laboratories.

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THE CAMBRIDGE MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE British Association for the Advancement of Science this year held its annual meeting in Cambridge from August 17 to 24. This was the fifth time since its foundation that meetings of the association had been held in Cambridge, and the second time in the present century. The first Cambridge meeting was the third of the association, held under the presidency of the Reverend Adam Sedgwick in 1833. The association met again in Cambridge in 1845, when Sir John Herschel was president, and has since convened in 1862 under the presidency of the Reverend Professor Willis, and in 1904 under that of the Rt. Hon. A. J. Balfour.

Cambridge is in many ways a uniquely suitable setting for the association meetings. Situated as it is in the heart of the fen country, flanked by the chalk escarpment in the south and east, the western plateau south of Madingley along the Cambridge-Bedford road, and the fens in the north, it presents unique natural features of geographical and physiographical interest in addition to those of immense historical and more purely intellectual import for which it is more famous. It is likewise geographically extremely well centered for a great number of academic and industrial institutions of research and of learning in general, being especially readily accessible from the London and Oxford areas and reasonably convenient to the Midlands.

The inaugural meeting of the association was held on the evening of August 17, in the Regal Cinema, St. Andrews Street, at 8:00 P.M. This year's president of the association was the Rt. Hon. Lord Rayleigh, who had officiated as president of Section A in 1929. His address, entitled "Natural Vision and Vision Aided by Science," dealt with two rather sharply differentiated subjects—the extension of our sense of vision in the many ways which science has made possible and the degree of responsibility which the scientist must bear and the degree of censure from society as a whole to which he is justly subject, in connection with modern warfare. The address has appeared in SCIENCE for August 26 and September 2.

THE SECTIONAL MEETINGS

The association met, as usual, in thirteen sections, beginning on Thursday, August 18, and continuing throughout the time of the meeting.

The presidential address in Section A, given by Dr. G. C. Darwin in the Arts School on Friday, August 19, dealt with "Logic and Probability in Physics," part of which was printed in the issue of SCIENCE of August 19.

The sectional papers were characterized particularly by the symposium on nuclear physics, introduced by Niels Bohr, and to which contributions were made, among others, by Cockroft, Bothe, Dee and Feather. The central theme of the discussion was the Cavendish cyclotron and the uses to which it would be put, a study of excited states and of neutron-induced radioactivities in general. The mathematics portion of the section program was devoted very largely to a discussion of Newtonian root evaluations and a symposium on combinatorial mathematics in the design of experiments. A symposium on magnetic alloys and x-ray structure comprised the second major portion of the physics program, introduced by Bragg and participated in, among others, by Stoner, Bradley, Sucksmith and Oliver. Symposia on high-altitude cosmic radiation and low temperature physics, introduced respectively by Professor P. M. S. Blackett and Dr. H. G. B. Casimir, continued an unusually rich program, which

was concluded by a symposium on seismology, introduced by Dr. F. J. W. Whipple.

The chemistry of gold was a principal theme of Section B (Chemistry) and was the subject of the presidential address of Professor Charles F. Gibson. Professor Gibson dealt particularly with the coordination numbers and covalency of aurous and auric gold. It was pointed out that while cuprous copper and argentous silver can exhibit 2- and 4-covalency, aurous gold is always 2-covalent, with the possible exceptions of the non-electrolytic complex aurous halides studied by Mann and his co-workers. Aurous gold shows an effective atomic number of 82. Auric gold is always coordinated and in its stable compounds always 4-covalent with a slight tendency to become 5-covalent. Gibson gave some account of original work in the preparation of dialkylhalogeno gold compounds, monoalkyldibromo complexes and cyano derivatives of organic gold compounds, and concluded with a discussion of the structure of gold compounds, with emphasis on the planar configuration and symmetrical distribution of the four valencies of tervalent Au and the possible 4-covalency of aurous gold.

The sectional discussions included symposia on the organic chemistry of metals, with emphasis on the noble metals, introduced by Dr. F. G. Mann, on modern methods of chemical analysis, introduced by Dr. J. J. Fox, a discussion on clays, of which the chairman was Professor E. K. Rideal, and one on the repercussions of synthetic organic chemistry upon biology and medicine, introduced by Professor Sir F. Gowland Hopkins. The meetings were punctuated by interesting trips of inspection of the chemistry laboratories, and to the works of the Cambridge Instrument Company in Carlyle Road and by a demonstration of gold films.

The meetings of Section C (Geology) were opened by an address by Professor O. T. Jones on the geology of the Cambridge district. The presidential address was given on Monday, August 22, on "Development and Evolution" by Professor H. H. Swinnerton. Professor Swinnerton considered at length the relative positions of phylogeny and ontogeny in the evolution of organisms, and the similarities and differences between the positions which were first defined by Von Baer and Haeckel on this subject, regarding *juvenile* and *adult* recapitulation. Attention was called to the fact that, on the whole, the more lowly and simple the organism, the more complete will recapitulation be found to be within its race. The phenomenon of localized recapitulation can be found in those organisms which reproduce by budding and a sort of colonial recapitulation in colonial organisms. Recapitulation of adult features occurs most frequently during the neanic period of development, while juvenile recapitulation, while undoubtedly occurring, is harder to elucidate. Coenogenesis (the appearance of new characters at an early stage of development), proterogenesis (the extension of new characters from early to late stages of development) deuterogenesis and tachygenesis (the appearance of new characters at the latest stage of development and their extension to earlier stages) and mutation were discussed and their interrelationships in the formation of the organism described at length. The sectional meetings included a joint discussion with Section K on the post-glacial history of the fenlands, and discussion on the distribution and migration of certain animal groups in the British Lower Paleozoic fauna, on the origin of carbonate rocks associated with alkali-rich intrusions and a series of individual papers. Excursions were included to Barnwell, Cherryhinton and Barrington, Upware and Warboys, Thrapston and Stamford, Breckland, Underwood Hall and Wood Ditton and other points of geological interest.

Section D (Zoology) had as president this year Dr. S. W. Kemp, whose address, entitled "Oceanography and the Fluctuation in the Abundance of Marine Animals," dealt in some detail with the intimate relationship between phosphate content of certain sea waters, especially those of the Channel, and the population of plankton and, ultimately, of fish life in those same areas. Dr. Kemp illustrated his thesis with a rather detailed history of the periodic fluctuations of herring abundance noted in the Channel and other waters over periods of years and the corresponding changes of phosphate content of those same waters. The sectional papers were mostly individual in character, the first several dealing with fish and fisheries, while later ones included discussions of zoological field stations in the United States, the succession of Hemiptera-Homoptera in the afforested areas of Breckland, phases in locusts, diversification of form in medusae and the origin of tetrapods. There was a joint discussion with Section K on the "Mechanism of Evolution," the chairman of which was Professor D. M. S. Watson, and a symposium on sense perception and the evolution of color and pattern introduced by Dr. J. S. Huxley. A semi-popular lecture was given on Monday, August 22, in the Arts Theater by Mr. H. C. Gilson on "Lake Titicaca," followed by biological films. There was a symposium, also, on the role of environment in animal locomotion. There was an excursion to Wicken Fen and Breckland.

The meetings of Section E (Geography) were introduced by the presidential address by Professor Griffith Taylor, on "Correlations and Culture, a Study in Technique." Professor Taylor went at length into the problems of race and language differentiation, pointing out that geography is essentially a liaison science, linking "environmental" with "human" studies. He set forth reasons for feeling that certain peculiarities common

to central Asia in ancient times favored the cradling of races of many kinds, and the rapid evolution of new forms from old—notably, perhaps, those of men from pre-men, exactly as we know occurred in the same region for sheep from antelopes. Professor Taylor went on to describe his well-known "zones and strata" theory of cultural evolution, and described the tendency in many different fields, for primitive forms, of culture, race, language or, among animals, species to be pushed to the periphery of a developmental area whose center they originally occupied. Taylor extended the zones and strata concept to many developments to which it ordinarily is not applied, such as the growth of a modern city. The address was concluded with an expression of the futility of such attempted race distinction as has been practiced variously in Continental Europe and by an appeal that the place of classics in a modern education be taken by the social sciences, especially in Australia and Canada. The sectional addresses included a series of papers on the geographical impressions of the Scientific Delegation to India, 1937–38, one on English ports and estuaries in their geographical setting, a discussion on some aspects of the regional concept and individual papers covering such subjects as King George VI Sound in the Antarctic, a description of the Geographical Laboratory, Suffolk agriculture in the Middle Ages, East Anglia and the Civil War, the physiography of Northwest Suffolk, the draining of the Fens, cirque formation in Iceland, the classification of communities by occupation, the Sidmouth coast and the preservation of its scenery, and irrigation in the Canterbury Plains of New Zealand. There were excursions to Hunstanton and to the Fenland, and to the River Great Ouse Catchment Board. The sectional dinner was held on Monday, August 22, and there was a joint tea with Section H at St. Catherine's College on Thursday, August 18.

The president of Section F (Economics) for this year was R. F. Harrod, whose address was entitled "Scope and Method of Economics." Dividing the pure theory of traditional economics into two elements, the first, theory of value and distribution, the second, the statement that productive resources should be so distributed among occupations as to yield an equi-marginal net profit, Harrod discussed economic criteria in general and methods of their examination, including the general static theory of value and distribution, dynamic economics so-called, representing the body of thought relating to the increase or decline of economic magnitudes and empirical economic studies. All three fields, it was pointed out, include powerful tools for the study of economic methods and results, and should be used coordinately. Individual section papers included discussions on the policy of government storage of foodstuffs and raw materials, the present position of sociology, unemployment in relation to the trade cycle, the economic recovery of Germany, public investment and trade cycle policy, professionalism, measurement of the mobility of labor, employment in the United Kingdom since 1929, local diversity of industry and the rate of unemployment, the interpretation and allocation of cost, the business view of the relation between price and cost, overhead costs, international short-term capital movements and the trend of Britain's balance of payments.

Professor R. V. Southwell, as president of Section G (Engineering), gave a penetrating and absorbing address on "The Changing Outlook of Engineering Science." Pointing out the analogy between the modern engineer and the modern medical man, both of whom are charged by society with the obligation to take the new facts discovered by more specialized and more socially remote workers and to apply them practically for the good of humanity, he considered in detail what might in fact be the fate of the relatively generalized engineer in a rapidly specializing world. Will he, in fact, be pushed to the wall by the highly technically trained, but perhaps humanly less competent, industrial physicist and chemist? Will he, within a few years, find that the honorable niche which has so long been reserved for him has, in fact, closed over? Professor Southwell concluded, comfortingly, that this is not true. The job of the engineer differs fundamentally from that of the industrial chemist or physicist in that while the latter will use his training directly in his industrial work, the former is required to learn, not facts, but methods of handling facts and people. Personality is therefore important in the equipment of the engineer, and it is much more important for him to have a broad fundamental grasp of principles than a detailed knowledge of subjects. In the training of the modern engineer, therefore, it is unwise to merely impose "harder papers" in examinations—it is breadth, not detail, of training which is wanted, and sufficient leisure to develop a degree of individual personality. The special outlook of engineers, Southwell felt, will preserve both academic and practical engineering from merging with either chemical or physical research, because of the predominantly applicational aspect of the engineering view-point, as opposed to the more purely detached view-point of scientific research. Southwell strongly urged a closer contact and cooperation between the academic and the industrial engineer—a point strongly stressed by Dr. Fleming in his address to the section last year. In conclusion, Southwell pointed out that the engineer is no more to be held responsible for the awful uses which an unprepared humanity may make of his discoveries and inventions than any other professional worker. In this conclusion, the address strongly reiterated the dicta

of Lord Rayleigh in his presidential address. Papers in the section included one on road development, a symposium on vibration, introduced by Professor C. E. Inglis, one on some experience in the use of scale models in general engineering, a joint discussion with Section A on magnetic measurements with special reference to incremental conditions, one on a new torque converter for motor cars, one on engineering instruments and several series of short papers by junior engineers. There were excursions to the works of Messrs. Chivers and Sons, Histon, Messrs. Pye, Ltd., and Messrs. Kryn and Lahey, in Letchworth.

The presidential address of Section H (Anthropology) was given on Monday, August 22, by Dr. V. Gordon Childe, on "The Orient and Europe." Dr. Childe considered at some length the probable extreme antiquity of Oriental culture, and the extent to which it has influenced all the cultural trends of modern Europe. He pointed out how thoroughly the almost purely speculative comment of Montelius in 1899 to the effect that Oriental cultures were already well established and differentiated at a time when the peoples of Europe were essentially without any civilization whatever had been proven by excavated evidence. Excavations have beyond all doubt established the immense antiquity of Oriental cultures, probably reaching back, in the Tel Halaf culture, to 5000 B.C., while work in Anatolia and excavations in Moravia go far toward proving connections between Europe and Asia. The Vardar-Moravia complex establishes at least once a continuity of culture from the Aegean to the Danube basin. On the strict application of Montelius' axiom, the beginnings of the Continental Bronze Age should be nearer 2800 than 1800 B.C. Finally Childe considered the effect that a more contracted chronology might have on Montelius' theory.

The sectional papers showed widely varied interests among the members. They included symposia on Australia and Australian life, introduced by Professor F. Wood-Jones, on the Swanscombe find, on the Middle Paleolithic and on Ritual. The individual papers were extremely numerous and included a very wide range of subjects, representative of which were addresses on the portholed megaliths of the British Isles, the Roman occupation of the Fenland, problems of winter life in Swedish Lapland, Manx house types, some sociological aspects of Cambridge, a new view of Quaternary cave art, the rediscovery of the ancient Orient, prehistoric Anatolia, re-examination of the Piltdown problem, the immense range of natural selection, a religious "racket" in the Gold Coast, the influence of sign language in civilization, calendar customs in the eastern counties, some Welsh light upon the evolution of the chair, survivals in dress and the equipment of the soldier throughout the ages. A sectional reception was held in the Museum of Archeology and Ethnology in Downing Street and at Leckhampton House. There was also an excursion to the Gog Magog Hills on Saturday.

The eye and brain as factors in visual perception, dealing with various aspects of the physiology of vision, formed the subject of the presidential address given before Section J (Psychology) by Dr. R. H. Thouless on Friday. Dr. Thouless discussed the evolution and the limitations of the "Transmission Theory" of vision as understood by Helmholtz, in which all mechanics of the process except those dealing directly with retinal changes were neglected. The transmission theory has been fruitful in the field of sensory physiology, but nearly valueless in the field of perception, because of its neglect of the lack of coordination between images as received and as sensed. Thouless pointed out that there is a discrepancy, very wide among certain individuals, between the image which is received on the retina and that sensed by the brain. Thus the image of a cardboard ellipse falling on the retina will appear to the brain to be circular when in fact it is not so. Similarly, judgments of distance are rarely accurate, being in some individuals too great, in others too small. People having "high phenomenal regression" tend, in general, to judge accurately both of the size and brightness of the objects which they see. Those, on the other hand, whose "phenomenal regression" is low tend to have a wide gap between the images which they see and those which they sense. It seems as if the image as it falls upon the retina acts as a cue or template upon which the mind can build up a picture, but the differences in the composite as against the received picture may be small or relatively great. The tendency to see real characters increases through life. Certain occupational classes seem to select for high or low phenomenal regression: thus artists, as a whole, tend to show a lower, good motorists and taxi drivers a higher, regression in general.

The sectional papers, again, were very numerous and exhibited an extremely wide range of subject and interest. Typical of them were ones dealing with heredity and mental hygiene, the problem of direction of thought, facts and fallacies in the social psychology of early childhood, temperament, social implications of vocational guidance, motor learning and morphology of the responses, recent experiments on birds, acquired color blindness, sensory adaptation in vision and hearing, friendliness and unfriendliness between different social groups, present trends in American psychology, generalized foreign politics, hormic psychology, a joint discussion with Section L on the educational significance of the cinema and wireless, assisting mental hygiene by literature, some verbal problems connected with the definition of personal qualities, examination of behavior in attempting difficult tasks, and some factors affecting the reliability of the interview as a method of obtaining personal information. Excur-

sions were arranged to the Royal Eastern Counties Institution in Colchester and the works of the Cambridge Instrument Company. There was also a demonstration of apparatus and experiments in the Psychological Laboratory.

Section K (Botany) met under the presidency of Professor W. Stiles, the subject of whose address was "The General Physiology of the Plant Cell and its Importance in Pure and Applied Botany." Stiles classified researches upon general cell physiology as belonging in general to four fields: those concerned with the physical and chemical constitution of protoplasm and other cell constituents, with the study of cell enzymes and their action, with problems of cell permeability and with respiration. A considerable discussion of aerobic and anaerobic respiration, with particular emphasis upon the part played by malic acid, was given. The disappearance of malic acid was ascribed to its oxidation to oxalacetic acid, the conversion of this to pyruvic acid and breakdown of the latter on removal of the inhibitor of carboxylase. Further consideration was given of mechanisms of respiration and of the absorption of water by the plant cell and the general phenomena connected with osmosis. The extreme importance of cell physiology in all branches of botany was stressed, and attention was called to its importance in agriculture, through such subjects as nutrition, carbon assimilation, vegetative development, flowering and fruiting. Its importance in food preservation techniques, through studies of rapid freezing and the effect of cold storage upon enzymes, cells and tissues, and in forestry and in the production of such plant products as cotton, linen, jute, rubber, tea, sugar and tobacco was emphasized.

The sectional addresses included symposia on the cultivation of British hardwoods, a joint discussion with Section D on the mechanism of evolution, already mentioned, and discussions on the ecological aspects of afforestation and the present aspects of plant virus research. Individual papers were very numerous. They were represented by reports of researches on the physical nature of the outer surface of the cell walls of the mesophyll of the leaf, the measurement of light in relation to plant growth and distribution, the roles of osmotic and electroosmotic pressures in the regulation of cell turgor, the effects of pressure on the properties of protoplasm, the comparative toxicity of inorganic plant poisons, temperature and the starch/sugar balance in potatoes, the hormone system of the rye grain, the catechol oxidase system, the sexual process in the rust fungi, the vegetation of the Inner Hebrides in the early Tertiary period, the present position of forestry at Cambridge University and a considerable number of ecological, taxonomic and structural papers. There was also a number of excursions, notably to the Roman Road and the Gog Magog Hills, the Cambridge Experimental Area and Conington Hall, to Wicken and to Weasenham Wood. The section dinner took place in the combination room of St. John's College.

The president of Section L (Education) was Mr. John Sargent. His address, "The Function of Administration in Public Education," was delivered on Friday, August 19. It dealt with the character of local administration as it affects school policy, and with suggested changes in it. Sargent pointed out that a vastly increased interest taken by the state in the affairs of the ordinary citizen in recent times has forced home the need for administrative devolution with consequent development of local administrative authority. This raises many problems in relation to the nature of the units themselves. The first is that of size, the present units dating in many cases from Saxon times and being highly non-uniform both in area and in number and character of population. It would be highly desirable to increase the uniformity of the units in these respects. The question of personnel is also a vexing one. The present personnel of educational administrative districts is essentially split into a professional and a non-professional portion, and the latter, again, into persons coopted for their knowledge and interest in education and those chosen by the people not primarily for this quality. The amateur portion of this personnel has deteriorated in recent years, and has come to consist more and more of persons with political aspirations of one sort or another. It was proposed that the educational standard of the personnel be uniformly raised to that of a university training, and suggestions were made as to desirable sizes and numbers of the administrative units.

The sectional papers included a report of the committee on the content of school curricula and discussions on tendencies in the design of schools, on education for a changing society and on the presidential address. An excursion was taken to Bottisham and Linton Village Colleges, and a luncheon was served for the section at Peterhouse at one o'clock on Thursday, August 18.

Section M (Agriculture) met on Friday, August 19, to hear the presidential address, delivered by Professor R. D. Stapledon, on ley-farming and a long-term agricultural policy. The address included a comprehensive summary and analysis of farming methods in Britain, including the arable farm, with crop rotation with or without resort to a one-year ley, the alternate husbandry-ley-farm type, with its arable-grass or grass-arable rotation, the nondescript and the permanent grass farms. Of these, Stapledon believed, the ley type of farm is much superior to any other, and the permanent grass, grazing type, much the worst from

the standpoint of efficiency, cleanliness and soil fertility. An extensive discussion was given of the ley, arable-grass type of farm, on which the speaker is an eminent authority. The address was closed with a discussion of plans for governmental loans to farmers, the "loans with advice" scheme, practiced in America, being most advocated. Rehabilitation loans to specially suitable areas were also recommended.

The section papers included comprehensive discussions on agriculture in relation to national employment, the practical problems of crop production and the practical problems of animal production. Visits were undertaken by the section to the University Farm Plant Breeding Institute, to Cressing Temple, Braintree, Lord Rayleigh's Farms, Hatfield Peverel, the Henry Ford Institute of Agricultural Engineering at Chelmsford, Little Hallingbury Park, at Bishop's Stortford and the farms of Messrs. Chivers and Sons, Ltd., at Histon.

Two evening discourses were delivered to members of all sections. The first, by Dr. H. Godwin on "The History of the Fens," was given in the Arts Theater on the evening of Friday, August 19, and the second, delivered in the theater on the following Monday, dealt with "The Contribution of the Electrical Engineer to Modern Physics," by M. L. Oliphant. Meetings of the Delegates of Corresponding Societies for the Association met on Friday, August 19, and on the following Monday to discuss matters of common interest to the societies and the association. The presidential address, entitled "The Importance of National Parks in the Preservation of the Flora and Fauna of Great Britain" was delivered by Rt. Hon. the Earl of Onslow. The delegates had dinner at the Dorothy Restaurant on Friday, and a visit was organized to the University Botanic Gardens on Monday.

A university reception for members of the association was held in the Senate House and Old Schools by the vice chancellor on Thursday evening, August 18, and on the evening of August 23 the Mayor and Mayoress of Cambridge invited members of the association to a sherry party in Emmanuel College. The masters and fellows of Downing College invited five hundred members of the association to a garden party in the grounds of the college on Friday afternoon. Similar invitations, to varying numbers of members, were issued by the masters and fellows of Sidney Sussex, Christ's and Queen's Colleges.

The masters and fellows of Trinity and St. John's Colleges invited a limited number of members of the association to informal conversaziones on Friday and Monday evenings, respectively. A dance was held in the ballroom of the Dorothy Café on Saturday evening, while the Cambridgeshire Branch of the English Folk Dance and Song Society invited members of the association to a party held in King's College Fellows' Garden, on the afternoon of Thursday, August 18.

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SPECIAL ARTICLES

EQUINE ENCEPHALOMYELITIS PRODUCED BY INOCULATION OF HUMAN ENCEPHALITIS VIRUS

FOTHERGILL *et al.*[1] and Webster and Wright[2] have reported the recovery of a filterable virus from the brains of children, of a nature very similar to equine encephalomyelitis virus (Meyer). A sample of one strain of the virus was submitted by Dr. Fothergill to the Pathological Division of the Bureau of Animal Industry through Colonel R. A. Kelser, U. S. Army Veterinary Corps, on September 24, 1938.

The virus, represented by portions of mouse brain in glycerine solution, was triturated on the day of receipt in a Ten Broeck tissue grinder, and an approximate 1.5 per cent. suspension in physiological salt solution was prepared. The suspension was cultured on serum agar slants and in beef infusion broth, which subsequently remained free of bacterial growth. Following culture and during the procedures of inoculating the trial horses, the brain suspension was kept in a container of iced water.

Three horses, one normal, an eastern-type[3,4,5,6] immune and a western-type immune were injected intracerebrally under local novocain anesthesia with 1 cc of the prepared suspension on September 24. Immediately following, on the same day, six guinea pigs were injected intracerebrally with 0.1 cc of the same suspension. All inoculations were completed by 1 P.M. On September 25 in the late afternoon the control horse had a temperature of 104.2° F. and the western immune a temperature of 101.8° F. On the days following, typical, progressive symptoms of encephalomyelitis (congested, "muddy" and icteric mucosae; maximum temperatures of 105.4°F. and 104.0° F.,

[1] Leroy D. Fothergill, John H. Dingle, Sidney Farber and M. L. Connerley, *New England Jour. Med.*, 219: 12, 411, 1938.

[2] Leslie T. Webster and F. Howell Wright, SCIENCE, 88: 2283, 305–306, 1938.

[3] L. T. Giltner and M. S. Shahan, *North American Veterinarian*, 14: 11, 25–27, 1933.

[4] M. S. Shahan and L. T. Giltner, *Jour. Am. Vet. Med. Asn.*, 86: n.s. 39, 6, 764–772, 1935.

[5] Carl Ten Broeck and Malcolm H. Merrill, *Proc. Soc. Exp. Biol. and Med.*, 31: 217–220, 1933.

[6] B. F. Howitt, *Proc. Soc. Exp. Biol. and Med.*, 35: 4, 526–528, 1937.