

---

---

NATIONAL ACADEMY OF SCIENCES

OF THE UNITED STATES OF AMERICA  
BIOGRAPHICAL MEMOIRS  
VOLUME XXII—FOURTEENTH MEMOIR

---

BIOGRAPHICAL MEMOIR

OF

RAYMOND PEARL

1879-1940

BY

H. S. JENNINGS

---

PRESENTED TO THE ACADEMY AT THE AUTUMN MEETING, 1942

---

---



*Raymond Pearl.*

## RAYMOND PEARL

1879-1940

BY H. S. JENNINGS

Raymond Pearl, Professor of Biology in the Medical School and in the School of Hygiene and Public Health of the Johns Hopkins University, died at Hershey, Pennsylvania, November 17, 1940, at the age of sixty-one years.

He was born at Farmington, New Hampshire, June 3, 1879. He came of a New England family of scholarly traditions, primarily in the classical direction. Earlier generations had included students of Greek and Latin, and it was the intention of Pearl's parents and grandparents that he should continue the family tradition in this respect. He attended school at Farmington; with two final years at the high school in Rochester, eight miles away, for the purpose of getting a better foundation in Greek and Latin. At the age of 16 he entered Dartmouth College, expecting to make the classics his chief field of study. During his first year he was more interested in the opportunities for free activity than in his studies; a fact which was reflected in the low grades which he received. But in that first year biology was a required subject, and this opened his eyes to what became his main interest. After the first week of the course in biology he consulted the instructor, John H. Gerould, as to whether he might, if he worked hard, go into biology rather than Greek. The change from classical to biological interests was a shock to his family, causing a rift that was long in healing. An account of Pearl in "Dartmouth '99",<sup>1</sup> speaks thus of his relation to biology: "The subject obsessed him. He talked, thought, studied and dreamed in terms of biology. He set himself an almost incredible standard of exactness and thoroughness. This standard he likewise unflinchingly demanded from all his students and associates, not excepting members of his own family in such ways as they shared his professional labors."

---

<sup>1</sup> A Thirty-fifth Report of the Class of 1899 of Dartmouth College. 1941. Book II: Good Companions All. R. Pearl (with portrait). This will be referred to as "Dartmouth '99."

He graduated from Dartmouth with the degree of A.B. in 1899. According to the Class Report before cited "Pearl was the youngest graduate in our class." During his senior year he was assistant in the course in general biology, of which the present writer was at that time in charge. He showed at that early period the masterful and competent personality that marked him throughout life.

But in his relations with the rest of the college his qualities of leadership were manifested mainly in relation to music,—at that time and throughout life his favorite avocation. As to this, certain paragraphs from the sketch in "Dartmouth '99", above quoted, present interesting pictures:

"He might be the first American to deliver the Heath Clark lectures at the University of London, or the most skillful juggler of the logistic curves of Verhulst; to us he was still the boy cornetist and the fellow who single handed conjured the first Dartmouth Band into existence out of rustic young neophytes and rusty and discarded tubas. He was our full-fledged impressario before we even knew there was such a word, and no crowd of urchins ever followed the Pied Piper of Hamelin so devotedly and gaily as we of '99 and all our Dartmouth contemporaries followed the imperious form of Pearl, as in corduroy or white duck trousers and with much 'windy suspiration of forced breath' he poured strange harmonies on the campus air." A member of his class gives (in the same publication) certain personal experiences: "Pearl had been talking to Joe and me trying to get us interested in some kind of a band instrument. Finally he dug up an alto horn for Joe and a battered old E-flat tuba for me. Where they came from God only knows. After working on them for a while we finally got the valves so they would work, and after that all Pearl had to do was to teach us how to finger the valves and teach us music, which was a tall order. He used to collar us and make us go up to the fraternity rooms (over Frost's jewelry store) and practice with him. After we got so we could play a few notes he used to make us march behind him around and around the billiard table."

All this is most characteristic, as will be recognized by those

who were associated with him in later life. Pearl never ceased to be propagandist for amateur musical performance. The account quoted above continues: "Ray became adept at almost every wind instrument. Even on the French horn, undertaken in middle life, and recognized as one of the most difficult of instruments, he became a proficient amateur. From boyhood to the latest gathering of Baltimore friends and wives at Hershey the night before he died, music had been a passion in Ray's life."

In the fall of 1899 Pearl went with me to the University of Michigan, where for three years he was assistant in zoology while at work as a graduate student. He took part in the Biological Survey of the Great Lakes, founded and led by the late Jacob Reighard, working on variation in fishes (1900 to 1902). He received at the University of Michigan in 1902 the degree of Doctor of Philosophy, at the age of twenty-three. From 1902 to 1906 he was Instructor in Zoology at the University of Michigan.

It was in the laboratory of the University of Michigan that he met Maud M. De Witt, who became his wife. She held at that time an important administrative place in the complex hierarchy of the large zoological laboratory. They were married in 1903. She accompanied him in study abroad during the years 1905 and 1906, when they worked at the University of London, the University of Leipzig, and at the Marine Biological Station at Naples. Mrs. Pearl later cooperated with him extensively in his scientific work, and at the time of his death was managing editor of the journal "Human Biology", and assistant editor of the "Quarterly Review of Biology"—the two journals founded and edited by Pearl.

Pearl published a number of contributions before receiving the doctorate. His dissertation was on the reactions and behavior of Planarians. He next contributed a series of papers on genetic problems in lower organisms. He then decided to enter the field of the application of statistical methods to biological problems and spent the year 1905-1906 at work with Karl Pearson at University College, London. During the same visit to Europe he worked also at Leipzig and at the Marine Biological

Station at Naples. While in London he finished and elaborated statistically a valuable piece of work on assortative mating in Protozoa. This he presented before the Royal Society of London; like many other contributions of Pearl it became a subject of controversy. He became in 1906 Associate Editor (with Pearson) of "Biometrika." But it was difficult for two such strong and aggressive personalities as Pearson and Pearl to work intimately together; there was a falling out, and the connection with "Biometrika" ceased in 1910. The two men remained friends, however: "there was a strong bond between them even if they did not agree on many subjects. They were in frequent correspondence", and after Pearson's death Pearl published (1936) an appreciative memoir of him.

Pearl returned to America in 1906, and was instructor in zoology at the University of Pennsylvania in 1906-1907. His contributions to biology were now mainly cast in the statistical mould. In 1907 he went to the University of Maine at Orono, as head of the department of biology of the Maine Agricultural Experiment Station, remaining there until 1918. During the years in Maine he made many contributions to the genetics and biology of the fowl and of other domestic animals, many of them published with his associate, F. M. Surface. In 1915 appeared two books. One was of a specialized character: a treatise on Diseases of Poultry, published with F. M. Surface and M. R. Curtis. The other was his first more general work on biological problems: a critical examination of methods of investigation, entitled "Modes of Research in Genetics." Use of mathematical methods was emphasized, and exemplified.

His work at the Maine Experiment Station showed a mastery of statistical methods, and an organizing ability such that on the entrance of the United States into the first World War he was called to Washington by Hoover to act as Chief of the Statistical Division of the newly organized United States Food Administration (1917-1919). He built up a large organization, which included a number of well-known men of science. During this period he published a number of papers on foods and prices; also a book on "The Nation's Food."

Early in 1918 Pearl was called, at the instance of Dr. William

Welch, to become Professor of Biometry and Vital Statistics in the newly founded School of Hygiene and Public Health of the Johns Hopkins University. He took up his work there in the fall of 1918. (While at Washington he was in 1917-18 on leave of absence from the Maine Agricultural Experiment Station. He was appointed at Johns Hopkins in 1918 but during the fall of that year he divided his time between the work at Washington and that at Baltimore. He was then sent to Europe on work of the Food Administration, and after his return continued to spend part of his time at Washington, part at Baltimore, until March 1, 1919, when he moved to Baltimore and devoted his full time to the University.) He organized at Johns Hopkins a department and laboratory of statistics, with Lowell J. Reed as associate professor; and gave courses in statistical methods and their application to biology and medicine.

Pearl remained at Johns Hopkins for the remainder of his life, though with some changes of work and title. It will be well at this point to note certain characteristics of the man and his work. He was a man of unusual height and weight, physically an impressive figure. His was a masterful personality, of extraordinary resourcefulness and initiative, of wide knowledge, astonishing power of work, remarkable versatility and scope, and strong ambitions. His interest in biology was encyclopedic. In his contributions he touched upon most aspects of the subject. This was not a matter of merely the extent of scattered interests, but rather of the kind of interest, and of the kind of man that he was. This has been best expressed by L. J. Henderson in his obituary notice in the American Philosophical Society's Yearbook for 1940:

"There are two kinds of men of science whose interests and activities greatly contrast. One kind, the orthodox, today very numerous, proceed by a kind of orthogenetical development and do not often step aside from a straight and narrow path. The other kind, rare today, though often met with three or even two centuries ago, feel that their intense interest in all things—their *philosophical* interest in an older sense of the word philosophical that has been preserved in the name of our Society—is a safe guide. Such a man was Francis Galton and another, in some measure a disciple of Galton's, was Raymond Pearl."

The breadth of Pearl's interests did not mean that his interest in particular subjects was weak. On the contrary his interest in any subject to which he gave his attention was so intense that at any given moment he might seem a partisan and propagandist of a particular field or method of biological science.

Among the seven hundred and twelve titles (including seventeen books) in the list of Pearl's writings hereto appended will be found contributions on the most varied fields or aspects of biology, or of human affairs as a division of biology. There are papers on animal behavior, from Protozoa to man; on general physiology; many on varied aspects of genetics (on variations, on abnormalities, on the breeding of *Drosophila*, of poultry, of cattle, of corn, of cantaloupes, on tongue colors in cattle, on the colors of hens' eggs, on the biology of sex, on the effects of parental alcoholism on progeny, on mutation, on methods of research in genetics, on the effect (or absence of effect) of selection, and on many other problems of genetics). There are many technical contributions on the care and breeding of fowls (fertility and fecundity in fowls, diseases of fowls, plumage patterns, egg production, keeping fowls free from lice, the folk-lore of hens' eggs, and the like). Many papers are devoted to technique, in the laboratory and in the field. There are extensive contributions to statistical methods, some abstruse, some directly practical. Many papers deal with disease: influenza, pneumonia, tuberculosis, cancer, encephalitis. Many papers (more than on any other subject) deal with the biology of man: papers on longevity and mortality, on the effects of alcohol and of tobacco, on eugenics, on race culture, on the biology of superiority, on the embryological basis of mortality, on infant mortality, on the biology of death, on population, on contraception, on the vitality of the peoples of America and of the peoples of England and Wales, on world overcrowding, on the biological effects of war, on the history of vital statistics, on patterns for living together. There are papers on food and prices, on wheat conservation, on "the nation's food", on food thrift, on business cycles. There are papers of philosophical import: on evolution and the origin of life, on "evolution and the Irish", on vegetarian biology, on the living machine, on the pragmatic stand-



point in philosophy, on natural theology without theistic implications, on reconciling religion and Darwinism, on humanizing biology, on "a philosopher for the bloc", on skepticism reconciled, on "scientists into philosophers", on "America today and possibly tomorrow." There are many miscellaneous papers on the most varied subjects constituting a sort of journalism of science: on an eighteenth century patron of science, on "the prince of colyumists", on statistics of garbage collection, on a new statistical journal, on Jewish and Christian marriages, on the work of agricultural experiment stations, and the like.

The journals or other publications to which Pearl contributed in addition to the usual journals of research in zoology, genetics or physiology, make a long list, which may be classified as follows:

*Statistical journals:* Biometrika, Metron, Journal of the Royal Statistical Society, Publications of the American Statistical Association, Nordisk Statistisk Tidskrift.

*Medical journals:* Medicine, American Medicine, Journal of the American Medical Association, Archives of Internal Medicine, New York Medical Journal, British Medical Journal, Southern Medical Journal, Review of Tuberculosis, Public Health Reports, American Journal of Public Health, Archives of Pathology, International Clinics, Birth Control Review, Bulletin of the Institute of the History of Medicine, Milbank Memorial Quarterly, American Journal of Obstetrics and Gynecology.

*Agricultural journals:* Farm and Home, American Breeders' Magazine, Breeders' Gazette, American Veterinary Review, Farmers' Advocate, Farm and Fireside, Hoard's Dairyman, Bulletin of the Maine Agricultural Experiment Station, Farmers' Bulletin of the United States Department of Agriculture, Inland Poultry Journal, Poultry Science, Journal of Agricultural Research, Horseman and Spirit of the Times.

*Encyclopedias:* Britannica, Americana, of the Social Sciences.

*Miscellaneous scientific publications:* Eugenics Review, Popular Science Monthly, Scientific Monthly, American Anthropologist, Journal of Biological Chemistry, Popular Science, Annals of the American Academy of Political and Social Science, Geographical

Review, Nature, Natural History, American Speech, Botanical Gazette, Annals of Botany, American Journal of Physical Anthropology, Political Science Quarterly, Bulletin of the American Mathematical Society, Ecology, Science Digest, American Journal of Sociology, Scientia, Journal of Social Psychology, Wattenschappeliike Bladen.

*Literary and miscellaneous journals:* The Independent, the Dial, Saturday Review of Literature, The Nation, World's Work, Ladies Home Journal, Harper's Magazine, the Annalist, Readers' Digest, Literary Review, American Mercury, Time and Tide, School and Society, Johns Hopkins Alumni Magazine, Cosmopolitan, Yale Review.

*Newspapers:* The New York Times, New York Evening Post, Baltimore Evening Sun.

This is a remarkable record of publication. It may be questioned whether in America it has ever been equaled by a man of science, in extent and variety. For the forty-one years during which Pearl was active in publication the average number of titles per year is 17.3. In some single years there were more than thirty titles; in 1913 there were thirty-four. The bibliographic record is a sufficient witness to the breadth of Pearl's interests and to the activity of his mind.

Yet from these facts it is not to be inferred that he lacked strong leading interests. The contrary is decidedly the case. He was strongly and continuously interested in certain particular fields, and he deeply influenced them. What the record shows is that in addition to being an investigator, he was greatly interested in the dissemination and propagation of scientific knowledge. And further he was intensely interested in the large and goodly frame of things.

His leading biological interests and fields of work may be traced somewhat as follows:

In his early years (1900 to about 1904) Pearl, like many young men entering science, simply took hold wherever he saw opportunity. He published notes on laboratory technique, summary reviews of work in general physiology, and studies in animal behavior (this being, in the laboratory where he was, a very active subject). Soon he began to show a predilection

for genetics, publishing observations on variations and abnormalities.

With the period of his study of biometrics with Pearson (1905-1906) these latter subjects became his chief field of interest. At the same time he acquired a strong interest, which he never lost, in the methods of mathematical handling of biological data; to these he made throughout life many contributions. At about this period began also his primary interest in man as a biological organism; this was destined to become later his chief field of labor.

With his transfer to the Maine Agricultural Experiment Station (1907) the domestic fowl became his chief object of biological study. He dealt with the specialized problems which it presents (becoming an authority in practical poultry breeding), and also with the fundamental questions (particularly in genetics) which the fowl presents in common with other organisms. He continued also during this period (1907-1918) his contributions to the lines of work which he had earlier begun: to statistical methods, to variation and inheritance and to biological relations in the life of man. During this period also began or became much intensified his activity in the dissemination of biological knowledge; now through contributions to non-technical and non-scientific journals, such as the *Independent* and the *Dial*.

The years (1917-1919) during which he headed the statistical division of the United States Food Administration formed an interlude in which he acquired interest in some additional phases of the biology of man: in food, in war, in administration and business. He made contributions on these matters, which were unified by the fact that they appertained all to the particular biological organism in which Pearl was most interested.

With the transfer to Johns Hopkins (1919) came gradually a centralizing of all his interests in the biology of man. A break with past interests was reinforced by a fire which in 1919 destroyed his notes on past work, as well as his large library of reprints. During the organization of the statistical laboratory and of courses in the statistical treatment of biology and medicine there was naturally an accentuation of interest in the prob-

lems of method, evidenced by the publication in 1923 of his well known textbook "Introduction to Medical Biometry and Statistics." As Statistician of the Johns Hopkins Hospital (1919-1935) he systematized autopsy records and published at intervals data and conclusions based on study of these.

Soon his studies took a more experimental and broadly biological turn. Though they were henceforth directed mainly toward the biology of man, he employed other organisms for experimental purposes. He carried through extensive breeding and experimental studies on *Drosophila*, with relation to duration of life and its inheritance, mortality, and growth of populations; and on the factors, genetic and environmental, that influence these. They were accompanied by statistical investigations on the same kinds of problems in man.

Based on these various lines of work, Pearl published several series of articles and a number of books. In 1922 appeared a volume on "The Biology of Death", based on Lowell Lectures given in 1920. From 1922 to 1927 appeared his "Experimental Studies on the Duration of Life", based on the work on *Drosophila*. The results of these studies, with much other material, were embodied in his books on "The Biology of Population Growth" (1925) and on "The Rate of Living" (1928). An extensive statistical investigation of the effects of the use of alcohol on longevity and mortality, based on a great number of case histories collected by Pearl, was published in 1926 as a book under the title "Alcohol and Longevity." This investigation led him to the conclusion that the moderate consumption of alcohol is not harmful, and on this conclusion he based his own practice. These studies and conclusions were widely publicized, giving rise to controversy. A similar study made in later years (1938) on the effects of the use of tobacco led him to the conclusion that tobacco is harmful even in small quantities. This again attracted much attention in the press.

From 1920 on appeared a series of papers with L. J. Reed on Population Growth and Its Mathematical Representation, culminating in a curve of population growth, which was employed in forecasting the course of human population in future

periods. This, like much of Pearl's other work, aroused interest and controversy.

Other contributions to the biology of man dealt with the biological nature and classification of diseases, and with biological aspects of certain special diseases, notably tuberculosis, cancer, influenza, pneumonia, diseases of the heart, encephalitis. Many contributions, up to the last, deal with human reproduction; including a series of reports on the problems and results of birth control, based largely on the operations of a birth control clinic in Baltimore. A volume of collected papers on the biology of man, entitled "Studies in Human Biology" was published in 1924.

In 1923 Pearl received the title of Professor of Biology in the Medical School, a title which he retained to the end of his life. His associations at Johns Hopkins were throughout with the medical divisions of the University, rather than with the distantly located departments of zoology and botany in the "Philosophical" Division. In 1925 he gave up the direction of the work of the Department of Statistics and was succeeded there by Lowell J. Reed. In that year Pearl became director of the Institute for Biological Research, an enterprise maintained in connection with the Johns Hopkins University for five years by the Rockefeller Foundation. He was enabled to devote himself for this period entirely to research. He had during this time the title of Research Professor in the Johns Hopkins University. The Institute for Biological Research was not adjoined to any of the existing schools or departments of the University, but was an independent division of it.

At the end of the five year period, in 1930, Pearl was given the title of Professor of Biology in the School of Hygiene and Public Health, remaining in this position till his death. He gave courses and supervised research in that school.

In 1926 Pearl founded the "Quarterly Review of Biology", and in 1929 the journal "Human Biology." The former was an outlet for his interests in the wide and miscellaneous questions of biology. It included general articles reviewing the situation in particular fields, by authorities in those fields, lists of important new publications, and a department of comments

and reviews on recent literature,—a department that was much appreciated. The first year all of the reviews were written by Pearl himself. In later years much of the reviewing was taken over by others, though Pearl always edited the reviews. The journal "Human Biology" was devoted to the subject in which Pearl's chief interests lay; it published detailed investigations on the biology of man, a department of "notes", and extensive annotated lists of literature. After the founding of "Human Biology", Pearl was disposed to give up the Quarterly Review of Biology to other editorship, but whenever this question was raised so many objections were made that he kept on with it. Gradually Mrs. Pearl assumed a large share of the work of the Quarterly Review, enabling Pearl to direct his interest and energy mainly to "Human Biology", and to his researches and other publications.

Since Pearl's death the editorship of the Quarterly Review of Biology has been taken over by Professor B. H. Willier, Director of the Department of Biology of the Johns Hopkins University. Professor L. J. Reed has taken the editorship of Human Biology.

Pearl's interest was taken most strongly perhaps by two subjects in human biology. These were longevity and fertility. He may be said to have made hobbies of these. For many years he collected books and articles on longevity, spending much time on his trips to Europe and elsewhere in searching for publications in this field. He formed thus a great collection of works on longevity, probably one of the most complete in existence. This is now housed temporarily in the Welch Library at Johns Hopkins. Longevity formed one of the most frequent subjects of Pearl's writings.

On fertility Pearl collected a great bibliography with abstracts. He had worked on this for ten years before his death. This bibliography has been given to the Welch Library of the Johns Hopkins University. In the Department of Biostatistics of the Johns Hopkins University have been placed Pearl's departmental records, and many of his books and collections of data. Among the latter is a twenty volume collection of suicide records.

Longevity, fertility and population problems continued Pearl's chief lines of interest to the last, though he was interested in all activities of man, looking upon them as biological phenomena. His last book, published in 1939, was on "The Natural History of Population." In 1938 he gave a series of lectures at the University of Indiana with the title "Man; the Unique Mammal." These were to have been published as a book to be entitled "Man the Animal." This book may yet appear; the question of publishing it is as yet unsettled.

In the later years Pearl's family collaborated with him in scientific work. Mrs. Pearl took a large share in the editing of the journals. Their daughter Ruth D. Pearl collaborated with him in his studies of longevity, and was joint author with him of the book on the Ancestry of the Long-lived (1934).

As became a student of the biology of man, Pearl was interested in his own forbears, and this interest was a not unimportant influence in his life. He and Mrs. Pearl collected the town histories of the region in which his family had lived—northeastern Massachusetts, southwestern Maine and southern New Hampshire. These contain full records of the Pearl family. The first to settle in this country was John Pearl, who traced his ancestry to Pearls who entered England at the time of the Norman Conquest. He came to this country some time before 1670, and settled ultimately at Boxford, not far from Salem, on a 200 acre farm that has belonged to the Pearl family or some of its branches ever since. The house in which John Pearl lived was a barracks house, built for defense against the Indians. It was bought in 1926 by the Boston Museum of Fine Arts, and two of its rooms are now on display in the Museum as the best extant example of the builder's art of early colonial times. The house has long been known as the "Pearl-Webster" house, a daughter of the original John Pearl having married a Webster, their descendants continuing to live in the house. Raymond Pearl descended from a second John, son of the original John Pearl. This second John moved north from Boxford and settled in what is now the region of New Hampshire known as Farmington. All of Raymond Pearl's ancestors go back to the original settlers of that general region; he was the first of

his line to leave Farmington and marry an outsider. "Throughout his life he felt himself a north of Boston man and cultivated and cherished the sentiments and some of the prejudices of his people", remarks his friend L. J. Henderson.<sup>2</sup>

The subjects of Pearl's works are precisely those aspects of biology that are of the most general interest. This fact, with his intense interest in the propagation of scientific knowledge, kept him in demand as a public lecturer. He was a special lecturer at the State College of Iowa at Ames, in 1910, at the Michigan Agricultural College at Lansing in 1912, and at University College, London, in 1927. He gave the Lowell Lectures at Boston in 1920, the Harrington Lectures at the University of Buffalo in 1928, the Heath Clark Lectures at University College, London, in 1937, the Patten Lectures at the University of Indiana in 1938. In the meantime he gave many single lectures and addresses in many parts of the United States, including one of the commemoration addresses at the University of Michigan Centenary in 1937.

Pearl's activities in many diverse fields brought him many honors and responsibilities. The University of Maine conferred on him the degree of LL.D.; Dartmouth College the honorary degree of Sc.D.; St. John's College, Annapolis, that of Litt.D. He was decorated as Knight (later Officer) of the Crown of Italy. He was elected in 1940 Honorary Member of the Royal Society of Medicine, in the Section of Epidemiology and State Medicine.

He was elected a member of the National Academy of Sciences in 1916 and was a member of its Council from 1919 to 1925. He was also a member of the American Philosophical Society and of the American Academy of Arts and Sciences. He was a member of the National Research Council, Member of its Executive Council, and Chairman of its Agricultural Committee in 1916-1918. He was a member of the Board of Visitors and Governors of St. John's College, Annapolis, 1928 to 1934; Trustee of Science Service 1929 to 1935.

---

<sup>2</sup> Yearbook for 1940 of the American Philosophical Society, page 431.



He was Associate Editor of *Biometrika* from 1906 to 1910, of the *Journal of Agricultural Research*, 1914 to 1918. At the time of his death, beside his own journals, he was a member of the editorial boards of *Genetics*, the *Journal of Experimental Zoology*, *Metron*, *Biologia Generalis*, and *Acta Biotheoretica*.

He was President of the American Society of Zoologists in 1913, of the American Society of Naturalists (1916-17); President of the American Statistical Association (1939), of the American Association of Physical Anthropologists (1934 to 1936) and of the International Union for Scientific Investigation of Population Problems, 1928 to 1930.

Pearl was active in many directions outside the vast scientific and professional activities above outlined. He was socially prominent and popular, of wide acquaintance in America and England, and numbered among his friends some of the most interesting personalities of his time. At the clubs to which he belonged in Baltimore he gave excellent dinners. "There was his delight in being a connoisseur of good food and wines, and his almost boyish delight in playing at times the role par excellence himself of amateur cook and salad mixer", says the characterization in "Dartmouth '99." We have seen that he was an amateur musician of unusual ability and drive. At times he nursed along an evening amateur musical ensemble, composed of members of his family and of neighboring families or of scientific associates. For a short time the present writer took part in one of these, clarinet in hand, till he discovered that he had not a rhythmic soul. Pearl belonged in Baltimore to a group of choice spirits centering about H. L. Mencken, which, under the name of the Saturday Night Club, met for social and musical purposes. To the members of this club he dedicated his volume on "Alcohol and Longevity", with its cheering message. Helpful in grasping Pearl's points of view on the world and life is a small volume which he published in 1927, under the title "To Begin With, Being Prophylaxis Against Pedantry." This takes the form of advice as to the background of reading appropriate to the student of science as a man of the world. The point of view is sophisticated and somewhat cynical; the book is appropriately dedicated to H. L. Mencken.

During the summer of 1940 Pearl was very tired. A medical examination revealed only a low blood pressure. The physician ordered rest and week-end trips to get out of touch with work. The second of these week-end trips was the one to Hershey, November 16. The afternoon was spent in the zoological park; Pearl was tired but enthusiastic. He died that night, toward morning. The autopsy showed coronary thrombosis and a condition in the coronary artery that was bound to lead to prolonged illness or to sudden death.

BIBLIOGRAPHY OF RAYMOND PEARL

1900-1941

(This bibliography was begun by Dr. Pearl himself and was completed by members of his department before the latter came to a close in June 1941.)

In this bibliography all titles cited are by Raymond Pearl alone, except where otherwise indicated by detailed citation of joint authorship.

Titles of *books* appear in their proper chronological order, but are distinguished from papers in journals etc. by prefixing the word [BOOK] before the citation of the title.

1900

On preparing earthworms for sectioning. *Journal of Applied Microscopy*, v. 3, p. 680.

Studies on electrotaxis. I.—On the reactions of certain infusoria to the electric current. *American Journal of Physiology*, v. 4, pp. 96-123.

A variation in the genital organs of *Lumbricus agricola* Hoffm. *Anatomischer Anzeiger*, Bd. 18, pp. 123-127.

Recent work in electrotaxis. *American Naturalist*, v. 34, pp. 977-979.

Reactions of the embryos and larvae of *Limulus*. [In "Zoological Journal Club of the University of Michigan"]. *Science*, N.S., v. 12, pp. 927-928.

Motor reactions of the ctenophore *Mnemiopsis leidyi*. [In "Zoological Journal Club" etc.]. *Ibid.*, p. 928.

1901

General physiology. *Journal of Applied Microscopy*, v. 4, pp. 1138-41; 1182-5; 1218-22; 1264-6; 1307-9; 1343-7; 1389-91; 1423-7; 1470-2; 1510-2; 1546-8; 1584-7.

Studies on the effects of electricity on organisms. II.—The reactions of *Hydra* to the constant current. *American Journal of Physiology*, v. 5, pp. 301-320.

Electrotaxis of infusoria. [In "Zoological Journal Club of the University of Michigan"]. *Science*, N.S., v. 13, pp. 745-746.

Some aspects of the electrotactic reaction of lower organisms. *Third Report Michigan Academy of Science*, pp. 73-74.

A curious habit of the slug *Agriolimax*. *Ibid.*, pp. 75-76.

The effect of very intense light on organisms. *Ibid.*, pp. 77-78. By R. P. and Leon J. Cole.

Certain reactions of the common slug *Agriolimax campestris* Binney. *Ibid.*, p. 79. By R. P. and Maud Mary DeWitt.

1902

Notes on technique, I. The preparation of sections of *Hydra* for class work. *Journal of Applied Microscopy and Laboratory Methods*, v. 5, pp. 1613-1614. By R. P. and Lewis H. Weld.

- Notes on technique, II. The demonstration of nerve fibers in the ventral cord of the earthworm. *Ibid.*, pp. 1614-1615.
- General physiology. *Ibid.*, pp. 1629-30; 1668-70; 1710-12; 1767-8; 1821-3; 1863-4; 1904-5; 1942-3; 2022-3; 2063-4; 2101-2.
- Notes on technique, III. On injecting the blood vessels of the earthworm. *Ibid.*, pp. 1736-7.

1903

- The movements and reactions of fresh-water planarians: A study in animal behaviour. *Quarterly Journal of Microscopical Science (London)*, v. 46, pp. 509-714.
- General physiology. *Journal of Applied Microscopy and Laboratory Methods*, v. 6, pp. 2151-2; 2197-8; 2247-9; 2292-3; 2344-6; 2392; 2434-5; 2481-4; 2536-8; 2582-3; 2632-3; 2711-4.
- Planarians. *Ibid.*, pp. 2360-2. [Reprinted, without essential change, in 1904 in *A Booklet for Teachers of Zoology and Botany in the High Schools of Michigan*, pp. 19-21, published by the Michigan Academy of Science, Section of Science Teaching.]
- Variation and correlation in *Arcella*. *Biometrika*, v. 2, pp. 321-337. By R. P. and Frances J. Dunbar.
- General laboratory technique. *Journal of Applied Microscopy and Laboratory Methods*, v. 6, pp. 2439-40; 2487-9; 2540; 2587-8; 2636; 2721-27.
- Worcester's formol-sublimate fixing fluids. *Ibid.*, p. 2451.
- On the mortality due to congenital malformations, with special reference to the problem of the relative variability of the sexes. *Medicine (Detroit)*. November No., pp. (of reprint) 1-15.
- On two cases of muscular abnormality in the cat. *Biological Bulletin*, v. 5, pp. 336-341.
- True hermaphroditism in man. *American Medicine*, v. 6, p. 892.

1904

- On the behavior and reactions of *Limulus* in early stages of its development. *Journal of Comparative Neurology and Psychology*, v. 14, pp. 138-164.
- Variation and correlation in the earthworm. *Fifth Annual Report Michigan Academy of Science*, pp. 200-202. By R. P. and Wilbur N. Fuller.
- Variation and correlation in *Arcella*. *Ibid.*, pp. 202-204. By R. P. and Frances J. Dunbar.
- A statistical study of conjugation in *Paramecium*. *Sixth Annual Report Michigan Academy of Science*, pp. 184-185. By R. P. and Mary J. Burr.
- Relative variability of man and woman [In "*Research Club of the University of Michigan*."] *Science*, N. S., v. 19, p. 73.
- The Michigan Academy of Science. *Ibid.*, pp. 787-790. [Report of R. P. as Secretary of the Academy.]

1905

- A notable advance in the theory of correlation. *Science*, N. S., v. 21, pp. 32-35.
- Note on variation in the ray flowers of *Rudbeckia*. *American Naturalist*, v. 39, pp. 87-8.
- Biometrical studies on man. I. Variation and correlation in brain-weight. *Biometrika*, v. 4, pp. 13-104.
- Variation and correlation in the earthworm. *Ibid.*, pp. 213-229. By R. P. and Wilbur N. Fuller.
- Some results of a study of variation and correlation in brain-weight. *Journal of Comparative Neurology and Psychology*, v. 15, pp. 467-481.
- Some results of a study of variation in *Paramecium*. *Seventh Report Michigan Academy of Science*, pp. 77-86. By R. P. and Frances J. Dunbar.
- A note on the calculation of certain probable errors. *Science*, N. S., v. 22, pp. 802-803.

1906

- C. L. Redfield's theory of heredity. *The Horseman and Spirit of the Times*, Jan. 30, 1906.
- On the mean duration of life of individuals dying within a year after birth. *Biometrika*, v. 4, pp. 510-16.
- A biometrical study of conjugation in *Paramecium*. *Proceedings of the Royal Society, B*, (London), v. 77, pp. 377-383.
- On the correlation between intelligence and the size of the head. *Journal of Comparative Neurology and Psychology*, v. 16, pp. 189-199.
- Variation in the number of seeds of the lotus. *American Naturalist*, v. 40, pp. 757-768.
- The calculation of the probable errors of certain constants of the normal curve. *Biometrika*, v. 5, p. 190.
- Variation in *Chilomonas* under favourable and unfavourable conditions. *Ibid.*, pp. 53-72.
- Bibliography. *Ibid.*, pp. 210-212. [An annotated bibliography of current biometric literature.]
- Allgemeine Biologie und Entwicklungslehre. *Zoologischer Jahresbericht für 1905*, pp. 1-20. By Paul Mayer and R. P.

1907

- Review of *The Behavior of Lower Organisms* by H. S. Jennings. *Journal of Comparative Neurology and Psychology*, v. 17, pp. 91-97.
- A biometrical study of conjugation in *Paramecium*. *Biometrika*, v. 5, pp. 213-297.
- [BOOK]. Variation and Differentiation in *Ceratophyllum*. *Washington, D. C.* (Carnegie Institution, Publication No. 58). Pp. 1-136. ["With the Assistance of Olive M. Pepper and Florence J. Hagle."]
- Morphogenetic localization in *Aglaophenia*. *Science*, N. S., v. 25, p. 781.

- The physical characteristics of the insane. *The Independent*, July 18, 1907, pp. 157-158.
- Bibliography. *Biometrika*, v. 5, pp. 482-486.
- [BOOK]. Variation and Correlation in the Crayfish with Special Reference to the Influence of Differentiation and Homology of Parts. *Washington, D. C.* (Carnegie Institution, Publication No. 64). Pp. 1-70. By R. P. and A. B. Clawson.
- Evolution and the origin of life. *The Dial*, October 1, 1907, pp. 208-211.
- Allgemeine Biologie und Entwicklungslehre. *Zoologischer Jahresbericht für 1906*, pp. 1-23. By Paul Mayer and R. P.
- Eugenics. *New York Evening Post*. Ca. October 8, 1907.
- A case of triplet calves with peculiar color inheritance. *Science*, N. S., v. 26, p. 760.

1908

- Breeding better men. The new science of eugenics which would elevate the race by producing higher types. *The World's Work*, January No., pp. 9818-9824.
- Some results of a biometrical study of egg production in the domestic fowl. *Science*, N. S., v. 27, pp. 449-450. By R. P. and Frank M. Surface.
- On certain points concerning the probable error of the standard deviation. *Biometrika*, v. 6, pp. 112-117.
- Bibliography. *Ibid.*, pp. 124-128; 445-451.
- An abnormality of the venous system of the cat, with some considerations regarding adaptation in teratological development. *Archiv für Entwicklungsmechanik*, Bd. 25, pp. 648-654.
- Biometrics. Recent contributions to theory. *American Naturalist*, v. 42, pp. 418-422.
- Eugenics. Book List No. 24. *The Independent*.
- Resection and end-to-end anastomosis of the oviduct in the hen, without loss of function. *American Journal of Physiology*, v. 22, pp. 357-361. By R. P. and Frank M. Surface.
- Review of *Mental and Moral Heredity in Royalty*, by F. A. Woods. *Biometrika*, v. 6, p. 445.
- Heredity. *The Independent*, August 13, pp. 376-377.
- Appliances and methods for pedigree poultry breeding. *Maine Agricultural Experiment Station Bulletin 159*, pp. 239-274. By R. P. and Frank M. Surface.
- On the relation of race crossing to the sex ratio. *Biological Bulletin*, v. 15, pp. 194-205. By R. P. and Maud DeWitt Pearl.
- The organization and work of the Department of Biology of the Maine Agricultural Experiment Station. *Maine Agricultural Experiment Station Circular No. 330*, pp. 1-8.
- Review of *Biology and its Makers*, by W. A. Locy. *The Independent*, October 1.

Review of *The Problem of Age, Growth and Death*, by Charles Sedgwick Minot. *Ibid.*, October.

Great movements and leaders in biologic science. *The Dial*.

1909

The use of atropin sulphate in anaesthetizing birds for surgical experiments. *Journal of the American Medical Association*, v. 52, pp. 382-3. By R. P. and Frank M. Surface.

Regulation in the morphogenetic activity of the oviduct of the hen. *Science*, N. S., v. 29, p. 428.

The nature of the stimulus which causes a shell to be formed on a bird's egg. *Ibid.*, p. 429. By R. P. and F. M. Surface.

A note on the degree of accuracy of biometric constants. *American Naturalist*, v. 43, pp. 238-240.

Evolution upside down. *The Dial*, v. 46, p. 24.

Poultry notes—1908. *Maine Agricultural Experiment Station Bulletin 165*, pp. 29-48. By R. P. and F. M. Surface.

Review of *The Physical Basis of Civilization*, by T. W. Heineman. *The Independent*, p. 1070.

Studies on the physiology of reproduction in the domestic fowl. II. Data on the inheritance of fecundity obtained from the records of egg production of the daughters of "200-egg" hens. *Maine Agricultural Experiment Station Bulletin 166*, pp. 49-84. By R. P. and F. M. Surface. [Abstract for popular distribution published as *Maine Agricultural Experiment Station Circular 345*, pp. 1-4.]

Data on variation in the comb of the domestic fowl. *Biometrika*, v. 6, pp. 420-432. By R. P. and Maud DeWitt Pearl.

The frequency constants of a variable  $z = f(x_1, x_2)$ . *Ibid.*, pp. 437-438.

Biometrics. Some recent studies on growth. *American Naturalist*, v. 43, pp. 302-316.

Apparate und Methoden, die bei experimentellen Untersuchungen über Vererbung beim Geflügel gebraucht werden. *Zeitschrift für biologische Technik und Methodik*, Bd. 1, pp. 285-299. By R. P. and F. M. Surface.

A notable contribution to biology. *The Dial*, v. 46, p. 267.

Studies on the physiology of reproduction in the domestic fowl. I. Regulation in the morphogenetic activity of the oviduct. *Journal of Experimental Zoology*, v. 6, pp. 339-359, 2 plates. [Autoreferat of this paper in *Archiv für Entwicklungsmechanik*, Bd. 28, Heft 1.]

Methods of poultry management at the Maine Agricultural Experiment Station. *U. S. Department of Agriculture Farmers' Bulletin 357*, pp. 1-39.

A biometrical study of egg production in the domestic fowl. I. Variation in annual egg production. *U. S. Department of Agriculture, Bureau of Animal Industry, Bulletin 110*, Part I, pp. 1-80. By R. P. and F. M. Surface.

- [Folklore of hen's eggs.] *Boston Evening Transcript*, May 29.
- Selection index numbers and their use in breeding. *American Naturalist*, v. 43, pp. 385-400. By R. P. and F. M. Surface.
- Transformations in the world of animal life. *The Dial*, v. 47, p. 76.
- Review of *Anwendung elementarer Mathematik auf biologische Probleme*, by Przibram. *Science*, N. S., v. 30, pp. 153-155.
- Review of *Essays Biographical and Chemical*, by Sir William Ramsay. *The Independent*, v. 67, p. 367.
- Taking stock of Darwinism. *The Dial*, v. 47, pp. 92-94.
- Review of *Fifty Years of Darwinism*. *The Independent*, v. 67, p. 480.
- Review of *Mendel's Principles of Heredity*, by William Bateson. *Ibid.*, p. 762.
- Studies on the physiology of reproduction in the domestic fowl. III. A case of incomplete hermaphroditism. *Biological Bulletin*, v. 17, pp. 271-287. By R. P. and Maynie R. Curtis.
- Studies on the physiology of reproduction in the domestic fowl. IV. Data on certain factors influencing the fertility and hatching of eggs. *Maine Agricultural Experiment Station Bulletin 168*, pp. 105-164. By R. P. and F. M. Surface. [Condensed edition issued to farmers as *Maine Agricultural Experiment Circular 363*, pp. 1-6.]
- Foundations of Darwin's famous book. *The Dial*, v. 47, p. 389.
- Is there a cumulative effect of selection? *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, Bd. 2, pp. 257-275. By R. P. and F. M. Surface.
- How to keep poultry free from lice. *Maine Agricultural Experiment Station Circular 352*, pp. 1-3.
- The poultry work of the Maine Agricultural Experiment Station. *Ibid.*, 369, pp. 1-6.
- 1910
- Some evolution house-cleaning. *The Dial*, v. 48, pp. 12-13.
- Bibliography. *Biometrika*, v. 7, pp. 414-420.
- Intra-individual variation and heredity. *Proceedings of the Seventh International Zoological Congress*, pp. (of reprint), 1-3.
- On the wrong tracks of life. *The Dial*, v. 48, pp. 116-117.
- For the culture of the race. *Ibid.*, p. 125.
- Race culture. *The Independent*, February 24, pp. 418-419.
- A triple-yolked egg. *Zoologischer Anzeiger*, Bd. 35, pp. 417-423.
- How can we breed 200-egg hens? *Farm and Home*, v. 31, p. 85.
- A classic of biological literature. *The Dial*, v. 48, pp. 316-317.
- The relation of the results obtained in breeding poultry for egg production to problem of selection. *Society for the Promotion of Agricultural Science, 30th Meeting*, pp. (of reprint) 1-8.
- Biology and medicine. *The Dial*, v. 48, pp. 360-361.
- Recent quantitative studies on variation in social insects. *American Naturalist*, v. 44, pp. 308-316.



- The possible eugenic bearing of certain experiments with poultry. *Eugenics Review* (London), v. 2, pp. 25-29.
- On the inheritance of the barred color pattern in poultry. *Archiv für Entwicklungsmechanik*, Bd. 30, pp. 45-61, 2 plates. By R. P. and F. M. Surface.
- Breeding for production in dairy cattle in the light of recent advances in the study of inheritance. *Eighth Annual Report of the Commissioner of Agriculture of Maine*, pp. 118-129.
- Poultry notes—1909. *Maine Agricultural Experiment Station Bulletin 179*, pp. 65-124. By R. P. and F. M. Surface. [Condensed edition issued to farmers as *Maine Agricultural Experiment Station Circular 394*, pp. 1-20.]
- Studies on hybrid poultry. *Maine Agricultural Experiment Station Annual Report, 1910*, pp. 84-115. By R. P. and F. M. Surface.
- Inheritance of hatching quality of eggs in poultry. *American Breeder's Magazine*, v. 1, pp. 129-133.
- Experiments in breeding sweet corn. *Maine Agricultural Experiment Station, Annual Report 1910*, pp. 249-307. By R. P. and F. M. Surface.
- Practical suggestions regarding the growing of sweet corn for packing and for seed. *Maine Agricultural Experiment Station Circular 393*, pp. 1-8. By R. P. and F. M. Surface.
- The pragmatic standpoint in philosophy. *The Dial*, v. 49, pp. 183-184.
- Evolution and the Irish. *Ibid.*, p. 290.
- Mutation. *The Independent*, November 24, pp. 1157-1158.
- Further data regarding the sex-limited inheritance of the barred color pattern in poultry. *Science*, N. S., v. 32, pp. 870-874. By R. P. and F. M. Surface.

1911

- Data on the relative conspicuousness of barred and self-colored fowls. *American Naturalist*, v. 45, pp. 107-117.
- Review of *Atavism in guinea-chicken hybrids*, by M. F. Guyer. *Zeitschrift für Abstammungs- und Vererbungslehre*, 1911, pp. 298-299.
- Review of *The First Principles of Heredity*, by A. S. Herbert. *The Dial*, v. 50, p. 60.
- Vegetarian biology. *Ibid.*, p. 128.
- A note regarding variation in the single combs of fowls. *Mendel Journal*, v. 1, pp. 189-195. [Also published as *Maine Agricultural Experiment Station Circular 412*, pp. 1-7.]
- A biometrical study of egg production in the domestic fowl. II. Seasonal distribution of egg production. *U. S. Department of Agriculture, Bureau of Animal Industry, Bulletin 110*, Part II, pp. 81-170. By R. P. and F. M. Surface.
- Davenport's "Inheritance of Characteristics in Domestic Fowl." *Science*, N. S., v. 33, pp. 328-330.

- Poultry diseases and their treatment. *Maine Agricultural Experiment Station Circular 398*, pp. ix + 216. By R. P., F. M. Surface, and Maynie R. Curtis.
- Biometrics. An introduction to statistical methods. *American Naturalist*, v. 45, pp. 319-320.
- Inheritance of fecundity in the domestic fowl. *Ibid.*, pp. 321-345.
- Inheritance in "blood lines" in breeding animals for performance, with special reference to the "200-egg hen." *Annual Report American Breeders Association*, v. 6, pp. 317-326.
- Some recent studies on variation and correlation in agricultural plants. *American Naturalist*, v. 45, pp. 415-425.
- Opportunities for corn breeding in Maine. *Maine Seed Improvement Association Annual Report for 1910*, pp. 146-155.
- Biometric arguments regarding the genotype concept. *American Naturalist* v. 45, pp. 561-566.
- An eighteenth-century patron of science. *The Dial*, v. 51, pp. 255-256.
- Biometric ideas and methods in biology. Their significance and limitations. *Scientia*, v. 10, pp. 101-119. [French translation, "Les idées et méthodes biométriques en biologie. Leur signification et leurs limitations." *Ibid.*, pp. 62-81.]
- Evolution: as speculation and as fact. *The Dial*, v. 51, pp. 297-298.
- The personal equation in breeding experiments involving certain characters of maize. *Biological Bulletin*, v. 21, pp. 339-366.
- The Mendelian inheritance of certain chemical characters in maize. *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, Bd. 6, pp. 1-28. By R. P. and James M. Bartlett.
- The "Seasons" of a later Thomson. *The Dial*, v. 51, pp. 531-532.
- A note on certain biometrical computations. *American Naturalist*, v. 45, pp. 756-760. By R. P. and Lottie E. McPheters.
- Breeding poultry for egg production. *Maine Agricultural Experiment Station Annual Report for 1911*, pp. 113-176.
- On the accuracy of trap nest records. *Ibid.*, pp. 186-193.
- Poultry notes—1910. *Maine Agricultural Experiment Station Bulletin 193*, pp. 177-200.

1912

- Studies on the physiology of reproduction in the domestic fowl. V. Data regarding the physiology of the oviduct. *Journal of Experimental Zoology*, v. 12, pp. 99-132. By R. P. and Maynie R. Curtis.
- Killing temperatures for hens' eggs. *Breeder's Gazette*, v. 61, p. 257.
- Making life in a test tube. *The Dial*, v. 52, pp. 84-85.
- Methods of feeding poultry. *Maine Agricultural Experiment Station Circular 447*, pp. 1-4.
- A case of hypospadias in a ram. *American Veterinary Review*, March, pp. 2-4.
- Review of *History of Biology*, by L. C. Miall. *The Dial*, v. 52, p. 28.

- The work of the Maine Agricultural Experiment Station in breeding poultry for egg production. *Practical Husbandry of Maine*, v. 2, pp. 136-139.
- Genetics and eugenics: a consideration of the relation of animal experimentation to human inheritance and infant conservation. *Eugenics Review* (London), v. 3, pp. 335-339. [Also reprinted in *Proceedings of the American Association for the Study and Prevention of Infant Mortality for 1911*, pp. 129-132.]
- Functions of the comb and wattles. *American Poultry World*, v. 3, p. 451. [Also reprinted in *Poultry* (London), June 21, 1912, p. 979.]
- Notes on the history of barred breeds of poultry. *Biological Bulletin*, v. 22, pp. 297-308.
- Further notes regarding selection index numbers. *American Naturalist*, v. 46, pp. 302-307.
- Recent discussions of heredity. *The Dial*, v. 52, pp. 397-398.
- The inheritance of fecundity. *Popular Science Monthly*, October, pp. 364-373. [Also reprinted in *Problems in Eugenics. Papers communicated to the First International Eugenics Congress, London*, pp. 47-57.]
- Breeding poultry. *Proceedings of the New York Farmers. Season 1911-12*, pp. 37-53.
- Controlling man's evolution. *The Dial*, v. 53, pp. 49-51.
- The secretory activity of the oviduct of the domestic fowl. *Proceedings Society for the Promotion of Agricultural Science for 1911*, pp. 29-34.
- The mode of inheritance of fecundity in the domestic fowl. *Journal of Experimental Zoology*, v. 13, pp. 153-268. [Also reprinted, with some alterations, in *Maine Agricultural Experiment Station, Annual Report for 1912*, pp. 283-394.]
- The First International Eugenics Congress. *The Independent*, Sept. 12, pp. 614-616.
- The First International Eugenics Congress. *Science*, N.S., v. 36, pp. 395-396.
- Problems of evolution. *The Dial*, v. 53, pp. 136-137.
- How many eggs can a hen lay? *Farm and Fireside*, November 9, p. 12.
- A case of triplet calves, with some general considerations regarding multiple gestation in normally uniparous animals. *Maine Agricultural Experiment Station Annual Report for 1912*, pp. 259-282.
- Mathematico-procrustean art. *The Dial*, v. 53, p. 380.
- Is there an "egg type" in the domestic fowl? *Farm and Fireside*, v. 36, No. 5, December 7, 2 pp.
- The Mendelian inheritance of fecundity in the domestic fowl. *American Naturalist*, v. 46, pp. 697-711.
- Breeding for egg production. *Farm and Fireside*, v. 36, December 21, 2 pp.
- Fat deposition in the testis of the domestic fowl. *Science*, N. S., v. 36, pp. 833-835. By R. P. and Alice M. Boring.

1913

- The living machine. *The Dial*, v. 54, pp. 51-52.
- The story of evolution. *Ibid.*, pp. 61-62.
- Note regarding the relation of age to fecundity. *Science*, N. S., v. 37, pp. 226-228.
- The fear of inbreeding. *Farm and Home*, Feb. 1, pp. 76 and 86. [Also reprinted in *Feathered Life* (London), March 12, p. 168.]
- An experimental investigation of the laws of milk production. A need and an opportunity. *Practical Husbandry of Maine*, v. 3, pp. 241-244.
- Vincent Astor's aim. To found a Rockefeller Institute of farming research, *New York Times*, February 21.
- Animal evolution by mutation. *The Dial*, v. 54, pp. 249-250.
- Review of *The Right of the Child to be Well Born*, by G. E. Dawson. *The Dial*, v. 54, p. 251.
- Data on sex determination in cattle. *Biological Bulletin*, v. 24, pp. 205-225. By R. P. and Howard M. Parshley.
- The contribution of poultry husbandry to the science of genetics. *Illustrated Poultry Record* (London), April No., pp. 300-1.
- Genetics and breeding. *Science*, N. S., v. 37, pp. 539-546.
- Methods of Poultry Management at the Maine Agricultural Experiment Station (Revised to February, 1913). *Maine Agricultural Experiment Station Circular 471*, pp. 1-78.
- The need for endowed agricultural research. *Science*, N. S., v. 37, pp. 707-709.
- Note on the sex behavior of the Poitou jacks. *Journal of Animal Behavior*, v. 3, pp. 297-299.
- Natural theology without theistic implications. *The Dial*, v. 55, pp. 111-112.
- The biology of poultry keeping. *Maine Agricultural Experiment Station Annual Report for 1913*, pp. 101-120.
- The measurement of the intensity of inbreeding. *Maine Agricultural Experiment Station Bulletin 215*, pp. 123-138.
- A contribution towards an analysis of the problem of inbreeding. *American Naturalist*, v. 47, pp. 577-614.
- Breeding for heavy egg production. *Reliable Poultry Journal*, v. 20, pp. 812-813; 860-862.
- Poultry notes 1911-1913. *Maine Agricultural Experiment Station Bulletin 216*, pp. 141-168.
- Reconciling religion and Darwinism. *The Dial*, v. 55, p. 362.
- Cabbages and the cosmos. *Ibid.*, p. 412.
- An introduction to the study of evolution. *Ibid.*, pp. 414-415.
- Tables for calculating coefficients of inbreeding. *Maine Agricultural Experiment Station Annual Report for 1913*, pp. 191-202. By R. P. and John R. Miner.

- On the correlation between the number of mammæ of the dam and size of litter in mammals. I. Interracial correlation. *Proceedings of the Society for Experimental Biology and Medicine*, v. 11, pp. 27-30.
- On the correlation between the number of mammæ of the dam and size of litter in mammals. II. Intraspecific correlation in swine. *Ibid.*, pp. 31-32.
- Breeding for egg production. *Poultry Institute . . . 38th Annual Meeting of the American Poultry Association*, pp. 10-14.
- Breeding poultry for egg production. *The Farmer's Advocate*, December 11, 1913, pp. 2160-2161.
- Recent discoveries which may modify breeding practice. *Breeder's Gazette*, v. 64, pp. 1206, 1273, 1279-1280.
- Biology. *Maine Agricultural Experiment Station Circular 485*, pp. 19-33.
- Die Furcht vor der Inzucht. *Geflügelzuechter für das Jahr 1914*, pp. 43-45. [Actually published in 1913.]
- Constants for normal variation in the fat content of mixed milk. *Maine Agricultural Experiment Station Annual Report for 1913*, pp. 299-305.
- Variation in the tongue color of Jersey cattle. *Proceedings of the Society for the Promotion of Agricultural Science 1913*, pp. (of reprint) 1-9.
- The relative time of fertilization of the ovum and the sex ratio amongst Jews. *American Anthropologist*, N. S., v. 15, pp. 668-674. By R. P. and Redcliffe N. Salaman.

1914

- On the results of inbreeding a Mendelian population: a correction and extension of previous conclusions. *American Naturalist*, v. 48, pp. 57-62.
- The odd chromosome in the spermatogenesis of the domestic chicken. *Journal of Experimental Zoology*, v. 16, pp. 53-83. By Alice M. Boring and R. P.
- The biology of sex. *The Dial*, v. 56, pp. 145-146.
- Some physiological observations regarding plumage patterns. *Science*, N. S., v. 39, pp. 143-144. By R. P. and Alice M. Boring.
- Possibilities in breeding for milk production. *Hoard's Dairyman*, v. 47, pp. 41, 54-55.
- A table for estimating the probable significance of statistical constants. *Maine Agricultural Experiment Station Annual Report for 1914*, pp. 85-88. By R. P. and John R. Miner.
- The service and importance of statistics to biology. *Quarterly Publications of the American Statistical Association*, March, pp. 40-48.
- Review of *Artificial Parthenogenesis and Reproduction* by Jacques Loeb. *The Dial*, v. 56, p. 391.
- Biological problems of today. *Ibid.*, p. 469.
- Looking glass music. *The Independent*, June 8, 1 p.

- A biometrical study of egg production in the domestic fowl. III. Variation and correlation in the physical character of the egg. *U. S. Department of Agriculture Bureau of Animal Industry, Bulletin 110, Part III*, pp. 171-241. By R. P. and F. M. Surface.
- Studies on inbreeding.—IV. On a general formula for the constitution of the  $n$ th generation of a Mendelian population in which all matings are of brother x sister. *American Naturalist*, v. 48, pp. 491-494.
- Biometrics. An important contribution to theory. *Ibid.*, pp. 505-507.
- Studies on the physiology of reproduction in the domestic fowl. VII. Data regarding the brooding instinct in its relation to egg production. *Journal of Animal Behavior*, v. 4, pp. 266-288.
- A Jersey landmark gone. *Hoard's Dairyman*, v. 48, p. 144.
- The measurement of changes in the rate of fecundity of the individual fowl. *Science*, N. S., v. 40, pp. 383-384.
- Studies on inbreeding. V. Inbreeding and relationship coefficients. *American Naturalist*, v. 48, pp. 513-523.
- Improving egg production by breeding. *Maine Agricultural Experiment Station Annual Report for 1914*, pp. 217-236.
- Studies on the physiology of reproduction in the domestic fowl. VIII. On some physiological effects of the ligation, section, or removal of the oviduct. *Journal of Experimental Zoology*, v. 17, pp. 395-424. By R. P. and Maynie R. Curtis.
- Studies on the physiology of reproduction in the domestic fowl. IX. On the effect of corpus luteum substance upon ovulation in the fowl. *Journal of Biological Chemistry*, v. 19, pp. 263-278. By R. P. and F. M. Surface.
- The policy of the journal. *Journal of the American Association of Instructors and Investigators in Poultry Husbandry*, v. 1, pp. 1-2. [An introductory editorial statement.]
- Rural leadership. *Community Efficiency Conference, Augusta, Maine, November 1914*, pp. 18-20.
- The color of the hen's legs. *Maine Agricultural Experiment Station Circular 499*, pp. 1-4.
- On the law relating milk flow to age in dairy cattle. *Proceedings of the Society for Experimental Biology and Medicine*, v. 12, pp. 18-19.
- On the refractive index of the serum in a guinea-chicken hybrid. *Ibid.*, p. 48. By R. P. and John W. Gowen.
- Brief report of progress on animal husbandry investigations in 1914. *Maine Agricultural Experiment Station Circular 503*, pp. 1-11.

1915

- Influence of the male bird in producing prolific layers. *Inland Poultry Journal*, v. 20, September No., 3 pp.
- Introductory statement on the use of logarithmic curves in biological and agricultural investigations. *Journal of Agricultural Research*, v. 3, pp. 411-412.

- Studies on outbreeding. II. Selection within pure lines. *Maine Agricultural Experiment Station Annual Report for 1915*, pp. 1-40. By F. M. Surface and R. P.
- Results with oats which help towards the solution of some fundamental problems of plant and animal breeding. *Maine Agricultural Experiment Station Circular 504*, pp. 1-7. By R. P. and F. M. Surface.
- Interpolation as a means of approximation to the gamma function for high value of  $n$ . *Science, N. S.*, v. 41, pp. 506-507.
- A case of assumption of male secondary sex characters by a cow. *Ibid.*, pp. 615-616. By R. P. and F. M. Surface.
- Growth and variation in maize. *Proceedings of the National Academy of Sciences*, v. 1, pp. 222-226. By R. P. and F. M. Surface.
- Mendelian inheritance of fecundity in the domestic fowl, and average flock production. *American Naturalist*, v. 49, pp. 306-317.
- Sex studies. VII. On the assumption of male secondary characters by a cow with cystic degeneration of the ovaries. *Maine Agricultural Experiment Station Annual Report for 1915*, pp. 65-80. By R. P. and F. M. Surface.
- Cystic degeneration of the ovaries in a cow accompanied by the assumption of the external appearance of a bull. *Maine Agricultural Experiment Station Circular 508*, pp. 1-4. By R. P. and F. M. Surface.
- Studies on the physiology of reproduction in the domestic fowl. XIII. On the failure of extract of pituitary body (anterior lobe) to activate the resting ovary. *Journal of Biological Chemistry*, v. 21, pp. 95-101. By R. P. and F. M. Surface.
- Dynamic evolution. *Journal of Heredity*, v. 6, pp. 254-256.
- Studies on the physiology of reproduction in the domestic fowl. X. Further data on somatic and genetic sterility. *Journal of Experimental Zoology*, v. 19, pp. 45-59. By M. R. Curtis and R. P.
- Studies on bean breeding. I. Standard types of yellow-eye beans. *Maine Agricultural Experiment Station Annual Report for 1915*, pp. 161-176. By R. P. and F. M. Surface.
- Suggestions for breeding yellow-eye beans of standard types. *Maine Agricultural Experiment Station Circular 510*, pp. 1-4. By R. P. and F. M. Surface.
- Breeding for sex. *Hoard's Dairyman*, v. 50, p. 71.
- Studies on inbreeding. VI. Some further considerations regarding cousin and related kinds of mating. *American Naturalist*, v. 49, pp. 570-575.
- Growth and variation in maize. *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, Bd. 14, pp. 97-203. By R. P. and F. M. Surface.
- A system of recording types of mating in experimental breeding operations. *Science, N. S.*, v. 42, pp. 383-386.
- Seventeen years selection of a character showing sex-linked Mendelian inheritance. *American Naturalist*, v. 49, pp. 595-608.

- [BOOK] Modes of Research in Genetics. *New York* (The Macmillan Co.). Pp. vii + 182.
- [BOOK] Diseases of Poultry. Their Etiology, Diagnosis, Treatment and Prevention. *New York* (The Macmillan Co.). Pp. xi + 342. By R. P., F. M. Surface, and M. R. Curtis.
- The publication of the results of investigations made in Experiment Stations in technical scientific journals. *Science*, N. S., v. 42, pp. 518-522.
- On the degree of exactness of the gamma function necessary in curve fitting. *Ibid.*, pp. 833-834.
- Further data on the measurement of inbreeding. *Maine Agricultural Experiment Station Bulletin* 243, pp. 225-248.
- Measurement of the winter cycle in the egg production of domestic fowl. *Journal of Agricultural Research*, v. 5, pp. 429-437.
- Report of progress on animal husbandry investigations in 1915. *Maine Agricultural Experiment Station Circular* 519, pp. 1-27.

1916

- Methods of poultry management at the Maine Agricultural Experiment Station. (Revised to January 1916). *Maine Agricultural Experiment Station Circular* 515, pp. 1-98.
- On the effects of feeding pituitary body (anterior lobe) substance, and corpus luteum substance to growing chicks. *Proceedings of the National Academy of Sciences*, v. 2, pp. 50-53.
- The prince of "colyumists." *The Dial*, v. 60, pp. 157-160.
- Fecundity in the domestic fowl and the selection problem. *American Naturalist*, v. 50, pp. 89-105.
- Studies on the physiology of reproduction in the domestic fowl. XIV. The effect of feeding pituitary substance and corpus luteum substance on egg production and growth. *Journal of Biological Chemistry*, v. 24, pp. 123-135.
- A method of correcting for soil heterogeneity in variety tests. *Journal of Agricultural Research*, v. 5, pp. 1039-1050. By R. P. and F. M. Surface.
- Report of the first Jersey sires futurity test of the Aroostook Jersey Breeders' Association. *Maine Agricultural Experiment Station Bulletin* 247, pp. 37-52.
- On the effect of continued administration of certain poisons to the domestic fowl, with special reference to the progeny. *Proceedings of the American Philosophical Society*, v. 55, pp. 243-258.
- The separate inheritance of plumage pattern and pigmentation in Plymouth Rocks. *Practical Husbandry of Maine*, April, 2 pp.
- The animal-breeding industry. *Scientific Monthly*, v. 3, pp. 23-30.
- The effect of parental alcoholism (and certain other drug intoxications) upon the progeny in the domestic fowl. *Proceedings of the National Academy of Sciences*, v. 2, pp. 380-384.



- Studies on the physiology of reproduction in the domestic fowl. XV. Dwarf eggs. *Journal of Agricultural Research*, v. 6, pp. 977-1042. 2 plates. By R. P. and M. R. Curtis.
- Data on the relation of the corpus luteum to primary and secondary sex characters. A summary of some recent experimental work. *Technical Supplement: Urological and Cutaneous Review*, v. 4, pp. (of reprint) 1-12.
- Note on the proportions of the sexes in the whitefish. *Michigan Academy of Science 17th Report*, p. 76.
- On the differential effect of certain calcium salts upon the rate of growth of the two sexes of the domestic fowl. *Science*, N. S., v. 44, pp. 687-688.
- Dwarf eggs of the domestic fowl. *Maine Agricultural Experiment Station Annual Report for 1916*, pp. 289-328. By R. P. and M. R. Curtis.
- Dwarf eggs. *Maine Agricultural Experiment Station Circular 530*, pp. 1-4. By R. P. and M. R. Curtis.
- Some effects of the continued administration of alcohol to the domestic fowl, with special reference to the progeny. *Proceedings of the National Academy of Sciences*, v. 2, pp. 675-683.
- On the degree of inbreeding which exists in American Jersey cattle. *Ibid.*, pp. 58-61. By R. P. and S. W. Patterson.

1917

- The experimental modification of germ cells. I. General plan of experiments with ethyl alcohol and certain related substances. *Journal of Experimental Zoology*, v. 22, pp. 125-164.
- The experimental modification of germ cells. II. The effect upon the domestic fowl of the daily inhalation of ethyl alcohol and certain related substances. *Ibid.*, pp. 165-186.
- The experimental modification of germ cells. III. The effect of parental alcoholism, and certain other drug intoxications, upon the progeny. *Ibid.*, pp. 241-310.
- The selection problem. *American Naturalist*, v. 51, pp. 65-91.
- The probable error of a difference and the selection problem. *Genetics*, v. 2, pp. 78-81.
- Some commonly neglected factors underlying the stock breeding industry. *Maine Agricultural Experiment Station Annual Report for 1917*, pp. 1-28.
- The probable error of a Mendelian class frequency. *American Naturalist* v. 51, pp. 144-156.
- Fertility and age in the domestic fowl. *Proceedings of the National Academy of Sciences*, v. 3, pp. 354-356.
- Report of progress on animal husbandry investigations in 1916. *Maine Agricultural Experiment Station Annual Report for 1917*, pp. 121-144.

- The change of milk flow with age, as determined from the seven day records of Jersey cows. *Ibid.*, pp. 145-152. By R. P. and S. W. Patterson.
- The sex ratio in the domestic fowl. *Proceedings of the American Philosophical Society*, v. 56, pp. 416-436.
- Studies on the physiology of reproduction in the domestic fowl. XVII. The influence of age upon reproductive ability, with a description of a new reproductive index. *Genetics*, v. 2, pp. 417-432.
- Studies on inbreeding. VII. Some further considerations regarding the measurement and numerical expression of degrees of kinship. *American Naturalist*, v. 51, pp. 545-559.
- Studies on inbreeding. VIII. A single numerical measure of the total amount of inbreeding. *Ibid.*, pp. 636-639.
- Sex studies. IX. Interstitial cells in the reproductive organs of the chicken. *Anatomical Record*, v. 13, pp. 253-268. By Alice M. Boring and R. P.
- Factors influencing the sex ratio in the domestic fowl. *Science, N. S.*, v. 46, p. 220.
- What can the Stations most profitably do to increase the efficiency of food production and conservation in the national emergency? *Proceedings of the 31st Annual Convention of the Association of American Agricultural Colleges and Experiment Stations*, pp. 256-260. [Dated 1917, but actually issued in 1918.]
- 1918
- Sex studies. X. The corpus luteum in the ovary of the domestic fowl. *American Journal of Anatomy*, v. 23, pp. 1-16, 9 plates. By R. P. and Alice M. Boring.
- Sex studies. XI. Hermaphrodite birds. *Journal of Experimental Zoology*, v. 25, pp. 1-47, 9 plates. By Alice M. Boring and R. P.
- Excerpts of speech of Dr. Raymond Pearl, made in Washington, D. C., before a conference of home economics workers, February 1918. *Washington* (U. S. Food Administration), pp. 1-8.
- War and prices. *Food News Notes for Libraries*, v. 1, No. 6, pp. 6-13.
- A new price index. *Ibid.*, No. 7, pp. 4-8.
- Biology and war. *Journal of the Washington Academy of Sciences*, v. 8, pp. 341-360.
- When you eat in hotels this summer. *Ladies Home Journal*, July issue, 2 pp.
- Wheat conservation the salvation of our allies. *The Annalist*, v. 12, p. 52. July 15 issue.
- General index numbers of food prices on a nutritive value base. *Washington* (U. S. Food Administration), August. Pp. 1-13.
- The seasonal distribution of swine breeding. *Scientific Monthly*, September issue. Pp. 244-251.
- Exports of foodstuffs to the Western Allies. *Oregon Voter*, v. 14, pp. 237-239.

RAYMOND PEARL—JENNINGS

- [BOOK] Reference Handbook of Food Statistics in Relation to the War. *Washington* (Government Printing Office). Pp. 1-124. By R. P. and Esther Pearl Matchett.
- Some correspondence anent Food Administration figures. Mr. Pearl's reply. *The Annalist*, v. 12, pp. 366; 383. October 14 issue.
- Statistics of garbage collection and garbage grease recovery in American cities. *Journal of Industrial and Engineering Chemistry*, v. 10, pp. 927-930.
- Message to the poultry world. *Reliable Poultry Journal*, v. 25, p. 775.

1919

- On the mean age at death of centenarians. *Proceedings of the National Academy of Sciences*, v. 5, pp. 83-86.
- Sterilization of degenerates and criminals considered from the standpoint of genetics. *Eugenics Review*, v. 11, pp. 1-6.
- The relative contribution of the staple commodities to the national food consumption. *Proceedings of the American Philosophical Society*, v. 58, pp. 182-222.
- Influenza studies. I. On certain general statistical aspects of the 1918 epidemic in American cities. *Public Health Reports*, v. 34, pp. 1743-1783.
- "Lion's" letters. *The Nation*, v. 108, pp. 837-838, May 24 issue.
- A statistical discussion of the relative efficacy of different methods of treating pneumonia. *Archives of Internal Medicine*, v. 24, pp. 398-403.
- Variation of Ayrshire cows in the quantity and fat content of their milk. *Journal of Agricultural Research*, v. 17, pp. 285-322. By R. P. and J. R. Miner. [A condensed version of this paper was also published in *Maine Agricultural Experiment Station Annual Report for 1919, Bulletin 279*, pp. 57-64.]
- An appeal. *Science*, N. S., v. 50, pp. 524-525. [Also printed in *Quarterly Publications of the American Statistical Association*, v. 16, p. 546.]
- Retail prices of food during 1917 and 1918. *Quarterly Publications of the American Statistical Association*, v. 16, pp. 411-439. By R. P. and Magdalen H. Burger.
- Preliminary note on the incidence of epidemic influenza among the actively tuberculous. *Ibid.*, pp. 536-540.
- Studies in milk secretion. VII. Transmitting qualities of Jersey sires for milk yield, butter-fat percentage and butter-fat. *Maine Agricultural Experiment Station Annual Report for 1919*, pp. 89-204. By R. P., John W. Gowen and John R. Miner.
- On the embryological basis of human mortality. *Proceedings of the National Academy of Sciences*, v. 5, pp. 593-598.

1920

- Food thrift. *Annals of the American Academy of Political and Social Science*, v. 87, pp. 118-127.

- [BOOK] The Nation's Food. A Statistical Study of a Physiological and Social Problem. *Philadelphia* (W. B. Saunders Co.). Pp. 274.
- Certain evolutionary aspects of human mortality rates. *American Naturalist*, v. 54, pp. 5-44.
- The significance of some general biologic principles in public health problems. *Journal of the American Medical Association*, v. 74, pp. 375-378.
- Review of *Inbreeding and Outbreeding, their Genetic and Sociological Significance*, by East and Jones. *Science*, N. S., v. 51, pp. 415-417.
- A new statistical journal. *Ibid.*, pp. 515-517.
- A contribution of genetics to the practical breeding of dairy cattle. *Proceedings of the National Academy of Sciences*, v. 6, pp. 225-233.
- The effect of war on the chief factors of population change. *Science*, N. S., v. 51, pp. 553-556.
- Some landmarks in the history of vital statistics. *Quarterly Publications of the American Statistical Association*, v. 17, pp. 221-223.
- On the rate of growth of the population of the United States since 1790 and its mathematical representation. *Proceedings of the National Academy of Sciences*, v. 6, pp. 275-288. By R. P. and L. J. Reed.
- On a single numerical index of the age distribution of a population. *Ibid.*, pp. 427-431.
- The relative influence of the constitutional factor in the etiology of tuberculosis. *American Review of Tuberculosis*, v. 4, pp. 688-712.
- Variation in the rate of infant mortality in the United States Birth Registration Area. *New York Medical Journal*, v. 112, pp. 1009-1014. [Also printed, with some changes, in *Eleventh Annual Meeting American Child Hygiene Association*, pp. 213-229, 1921.]

1921

- A further note on war and population. *Science*, N. S., v. 53, pp. 120-126.
- Influenza studies. II. Further data on the correlation of explosiveness of outbreak of the 1918 epidemic. *Public Health Reports*, v. 36, pp. 273-289.
- Influenza studies. III. On the correlation of destructiveness of the 1918 epidemic. *Ibid.*, pp. 289-294.
- Influenza studies. IV. On the correlation between explosiveness and total destructiveness of the epidemic mortality. *Ibid.*, pp. 294-298.
- The biology of death. I. The problem. *Scientific Monthly*, v. 12, pp. 193-214.
- The biology of death. II. Conditions of cellular immortality. *Ibid.*, pp. 321-335.
- The biology of death. III. The chances of death. *Ibid.*, pp. 444-456.
- The biology of death. IV. The causes of death. *Ibid.*, pp. 489-516.
- The biology of death. V. The inheritance of duration of life in man. *Ibid.*, v. 13, pp. 45-65.

- The biology of death. VI. Experimental studies on the duration of life. *Ibid.*, pp. 143-162.
- The biology of death. VII. Natural death, public health, and the population problem. *Ibid.*, pp. 193-212.
- Forecasting the growth of nations. The future population of the world and its problems. *Harper's Magazine*, v. 142, pp. 704-713. May issue. By R. P. and Fred C. Kelly.
- A biological classification of the causes of death. *Metron*, v. 1, No. 3, pp. 92-99.
- Studies on the physiology of reproduction in the domestic fowl. XIX. On the influence of free choice of food materials on winter egg production and body weight. *American Journal of Hygiene*, v. 1, pp. 253-277. By R. P. and T. E. Fairchild.
- The significance of biometry and vital statistics to the science of medicine. *Nelson Loose Leaf Medicine*, v. 7, pp. 111-127; 127A-127H.
- Modern methods of handling hospital statistics. *Johns Hopkins Hospital Bulletin*, v. 32, pp. 184-194.
- A statistical note on epidemic encephalitis. *Ibid.*, pp. 221-225.
- Studies on the physiology of reproduction in the domestic fowl. XVIII. Further observations on the anatomical basis of fecundity. *Journal of Experimental Zoology*, v. 34, pp. 101-118. By R. P. and W. F. Schoppe.
- A statistical note [accompanying a paper by John T. King, Jr. on "Determination of the basal metabolism from the carbon-dioxide elimination."] *Johns Hopkins Hospital Bulletin*, v. 32, pp. 285-286.
- Biometric data on infant mortality in the United States Birth Registration Area, 1915-1918. *American Journal of Hygiene*, v. 1, pp. 419-439.
- The vitality of the peoples of America. *Ibid.*, pp. 592-674.
- Experimental studies on the duration of life. I. Introductory discussion of the duration of life in *Drosophila*. *American Naturalist*, v. 55, pp. 481-509. By R. P. and Sylvia L. Parker.
- Jennings anniversary celebration. *Science*, N. S., v. 54, pp. 25-26. [Unsigned.]
- Some biological aspects of human mortality. *Proceedings of the Pathological Society of Philadelphia*, N. S., v. 23, pp. 84-87.

1922

- Review of *The Friendly Arctic* by V. Stefansson. *Science*, v. 55, pp. 320-321.
- The vital index of the population of England and Wales, 1838-1920. *Proceedings of the National Academy of Sciences*, v. 8, pp. 71-76. By R. P. and Magdalen H. Burger.
- Seasonal fluctuations of the vital index of a population. *Ibid.*, pp. 76-78.
- A note on the inheritance of duration of life in man. *American Journal of Hygiene*, v. 2, pp. 229-233.

- Experimental studies on the duration of life. II. Hereditary differences in duration of life in line-bred strains of *Drosophila*. *American Naturalist*, v. 56, pp. 174-187. By R. P. and Sylvia L. Parker.
- Preliminary note on a biometrical study of the relations of certain viscera in tuberculosis. *Proceedings of the National Academy of Sciences*, v. 8, pp. 125-128. By R. P. and Agnes Latimer Bacon.
- Experimental studies on the duration of life. III. The effect of successive etherizations on the duration of life of *Drosophila*. *American Naturalist*, v. 56, pp. 275-280. By R. P. and S. L. Parker.
- Biometrical studies in pathology. I. The quantitative relations of certain viscera in tuberculosis. *Johns Hopkins Hospital Reports*, v. 21, fasc. III, pp. 157-230. By R. P. and Agnes L. Bacon.
- On the influence of density of population upon the rate of reproduction in *Drosophila*. *Proceedings of the National Academy of Sciences*, v. 8, pp. 212-219. By R. P. and Sylvia L. Parker.
- Experimental studies on the duration of life. IV. Data on the influence of density of population on duration of life in *Drosophila*. *American Naturalist*, v. 56, pp. 312-321. By R. P. and S. L. Parker.
- New data on the influence of alcohol on the expectation of life in man. *American Journal of Hygiene*, v. 2, pp. 463-466.
- The population problem. *Geographical Review*, v. 12, pp. 636-645.
- World overcrowding. *New York Times*, Sunday, October 8. 1 p.
- Experimental studies on the duration of life. V. On the influence of certain environmental factors on duration of life in *Drosophila*. *American Naturalist*, v. 56, pp. 385-398. By R. P. and S. L. Parker.
- Experimental studies on the duration of life. VI. A comparison of the laws of mortality in *Drosophila* and in man. *Ibid.*, pp. 398-405.
- A further note on the age index of a population. *Proceedings of the National Academy of Sciences*, v. 8, pp. 300-303. By R. P. and T. J. LeBlanc.
- The statistical evaluation of public health activities. *American Journal of Public Health*, v. 12, pp. 915-921.
- [BOOK] The Biology of Death. Being a Series of Lectures Delivered at the Lowell Institute in Boston in December 1920. *Philadelphia and London* (J. B. Lippincott Co.). 275 pp.
- Preliminary discussion of the correlation between illiteracy and mortality in American cities. *American Journal of Hygiene*, v. 2, pp. 587-600. By R. P. and Morrill L. Iisley.
- Trends of modern biology. *Science*, N. S., v. 56, pp. 581-592.
- Biometrical studies in pathology. II. Pathometric index numbers: preliminary account of a quantitative method of evaluating pathological phenomena. *Johns Hopkins Hospital Bulletin*, v. 33, pp. 406-412.
- A further note on the mathematical theory of population growth. *Proceedings of the National Academy of Sciences*, v. 8, pp. 365-368. By R. P. and L. J. Reed.

- Review of *United States Life Tables 1890, 1901, 1910, and 1901-1910*, by James W. Glover. *Science N. S.*, v. 56, pp. 756-757.
- Introduction to "An Elementary Treatise on Frequency Curves and their Application in the Analysis of Death Curves and Life Tables" by Arne Fisher. *New York* (Macmillan), pp. i-iii.
- 1923
- The age at death of the parents of the tuberculous and the cancerous. *American Journal of Hygiene*, v. 3, pp. 71-89.
- New experimental data on the influence of density of population upon duration of life in *Drosophila*. Preliminary Note. *Ibid.*, pp. 94-97. By R. P. and S. L. Parker.
- A comparison of the mortality of certain lower organisms with that of man. *Science*, v. 57, pp. 209-212. By R. P. and Carl R. Doering.
- Some eugenic aspects of the problem of population. *Scientific Papers . . . Second International Congress of Eugenics, Vol. II. Eugenics in Race and State*, pp. 212-214.
- The menace of population growth. *Birth Control Review*, v. 7, pp. 65-67.
- The population problem. *Literary Review*, v. 3, p. 533.
- Experimental studies on the duration of life. VII. The Mendelian inheritance of duration of life in crosses of wild type and quintuple stocks of *Drosophila melanogaster*. *American Naturalist*, v. 57, pp. 153-192. By R. P., S. L. Parker, and B. M. Gonzalez.
- Predicted growth of Population of New York and its Environs. *New York* (Plan of New York and its Environs). Pp. 42. By R. P. and L. J. Reed.
- Interrelations of the biometric and experimental methods of acquiring knowledge: with special reference to the problem of the duration of life. *The Harvey Society Lectures 1921-1922*, pp. 179-205. [Also reprinted in *Metron*, v. 2, pp. 697-721.]
- Common sense about living. *Literary Review*, v. 3, p. 828.
- How little we know! *The Survey*, v. 50, pp. 441-442.
- Review of *Heredity and Environment in the Development of Men* (5th edit.). *Birth Control Review*, v. 7, p. 183; of *The Mathematical Theory of Probabilities* etc., by Arne Fisher and *A Treatise on Probability* by J. M. Keynes. *Science*, v. 58, pp. 51-52.
- On the mathematical theory of population growth. *Metron*, v. 3, pp. 6-19. By R. P. and L. J. Reed.
- [BOOK] Introduction to Medical Biometry and Statistics. *Philadelphia and London* (W. B. Saunders Co.). 379 pp.
- Alcohol and mortality. In "The Action of Alcohol on Man." *London* (Longmans, Green and Co.), pp. 213-286.
- Duration of life as an index of constitutional fitness. *Poultry Science*, v. 3, pp. 1-10.

- Review of *Contraception (Birth Control)* by Marie C. Stopes. *Birth Control Review*, v. 7, pp. 335-336.
- The population problem. *Literary Review*, v. 4, p. 384.
- The absolute weight of the heart and the spleen. *Proceedings of the National Academy of Sciences*, v. 9, pp. 428-433. By R. P. and A. L. Bacon.

1924

- Alcohol and the duration of life. *The American Mercury*, v. 1, pp. 213-215.
- Preliminary account of an investigation of factors influencing longevity. *Journal of the American Medical Association*, v. 82, pp. 259-264.
- Biometrical studies in pathology. III. The absolute weight of the heart and spleen in tuberculous persons. *Johns Hopkins Hospital Reports*, v. 21, fasc. v, pp. 297-377. By R. P. and Agnes L. Bacon.
- Experimental studies on the duration of life. IX. New life tables for *Drosophila*. *American Naturalist*, v. 58, pp. 71-82. By R. P. and S. L. Parker.
- Review of *Population* by H. Wright, and *Population Problems* by E. B. Reuter. *Baltimore Evening Sun*, March 8, p. 6.
- Experimental studies on the duration of life. X. The duration of life of *Drosophila melanogaster* in the complete absence of food. *American Naturalist*, v. 58, pp. 193-218. By R. P. and S. L. Parker.
- The probable error of certain constants of the population growth curve. *American Journal of Hygiene*, v. 4, pp. 237-240. By R. P. and L. J. Reed.
- Alcohol and life duration. *British Medical Journal*, May 31, pp. 948-950.
- The influence of alcohol on duration of life. *Proceedings of the National Academy of Sciences*, v. 10, pp. 231-237.
- Starvation life curves. *Nature*, v. 113, p. 854.
- The racial effect of alcohol. *Eugenics Review*, v. 16, pp. 9-30.
- The influence of alcohol on duration of life. *Science*, v. 59, p. 445.
- The curve of population growth. *Proceedings of the American Philosophical Society*, v. 63, pp. 10-17.
- [BOOK] Studies in Human Biology. *Baltimore* (Williams and Wilkins Co.). 653 pp.
- The influence of physical activity upon mortality. A reprint of Chapter XI of *Studies in Human Biology*, pp. 298-354. By R. P. and Paul R. Hawley.
- The biology of population growth. *American Mercury*, v. 3, pp. 293-305.
- The racial origin of almshouse paupers in the United States. *Science*, v. 60, pp. 394-397.
- Humanizing biology. *Saturday Review of Literature*, v. 1, p. 262.
- Note on Dr. John Brownlee's paper on age vitality. *American Naturalist*, v. 58, pp. 564-566.
- Biologia Generalis. *Science*, v. 60, p. 424.
- Microbes, the unseen foe. *Baltimore Evening Sun*, November 15.



[BOOK] Liv och Dod. Biologiskt-statistiska Studier. Till Svenska av Ivar Trägårdh. *Stockholm* (Hugo Gebers Förlag). Pp. xvi + 191. [Swedish translation of *The Biology of Death*.]

1925

- Looking ahead in business. *Baltimore Evening Sun*, February 11.
- Skew-growth curves. *Proceedings of the National Academy of Sciences*, v. 11, pp. 16-22. By R. P. and L. J. Reed.
- The Life, Letters and Labours of Francis Galton. [Review of Pearson's biography of Galton, Vols. I and II.] *Science*, v. 61, pp. 209-212.
- Almshouse paupers in the United States, *Ibid.*, p. 285. [Reprinted with the title "Facts, reasons and pauperism." Same bibliographic locus.]
- On the inheritance of duration of life. *Memorial Publication in Honor of 100th Birthday of J. G. Mendel Issued by the Czechoslovak Eugenics Society in Prague*, pp. 175-192.
- Distribution of physicians in the United States. A commentary on the report of the General Education Board. *Journal of the American Medical Association*, v. 84, pp. 1024-1028. [Also printed in *Proceedings . . . Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals. Chicago March 9-12, 1925. Chicago* (American Medical Association), pp. 62-66. Discussion, p. 70.]
- Educational and professional standards for vital statisticians. *American Journal of Public Health*, v. 15, pp. 518-520. By W. W. Kopf, O. R. Eichel, R. P. and E. Sydenstricker.
- Review of Swinburne's Population and the Social Problem. *Baltimore Evening Sun*, June 13, p. 8.
- The reading of graduate students. *Scientific Monthly*, v. 21, pp. 34-44.
- Business cycles and their effect on births and deaths. *Baltimore Evening Sun*, July 25, p. 6.
- Biologja wzrostu ludności. [The biology of population growth.] *Medecyny Doswiadozalnej i Społecznej*, T. 4, Zes. 3-6, pp. (of reprint) 1-19. [Polish translation by M. Kacprzak.]
- Review of *Is Unemployment Inevitable?* *Eugenics Review* (London), v. 17, pp. 107-108.
- The menace of population growth. In *Birth Control Facts and Responsibilities. A Symposium dealing with this Important Subject from a Number of Angles*. Edited by Adolf Meyer. *Baltimore* (Williams and Wilkins Co.), pp. 50-61.
- The differential birth rate. *Birth Control Review*, v. 9, pp. 278-279; 300-302.
- Some recent biological texts. *Biologia Generalis*, v. 1, pp. 501-504.
- [BOOK] The Biology of Population Growth. *New York* (Alfred A. Knopf). Pp. xiv + 260.
- Adam Smith on medical education and related matters. *Journal of the American Medical Association*, v. 85, pp. 1663-1665.
- The biology of health. *The American Mercury*, v. 6, pp. 385-392.

- Vital statistics of the National Academy of Sciences. I. Age at election. *Proceedings of the National Academy of Sciences*, v. 11, pp. 752-757.
- Vital statistics of the National Academy of Sciences. II. Election of young men. *Ibid.*, pp. 757-760.
- Vital statistics of the National Academy of Sciences. III. Mortality. *Ibid.*, pp. 760-765.
- Vital statistics of the National Academy of Sciences. IV. The present limitation to total membership and other matters. *Ibid.*, pp. 765-768.
- 1926
- The influence of alcohol upon the growth of seedlings. *Journal of General Physiology (Jacques Loeb Memorial Volume)*, v. 8, pp. 215-231. By R. P. and Agnes Allen.
- Foreword. *Quarterly Review of Biology*, v. 1, No. 1, pp. 1-3.
- New biological books. Brief notices. *Ibid.*, 124-137; 294-314; 444-464; 584-605. [Unsigned.]
- Havelock Ellis and human biology. *Birth Control Review*, v. 10, pp. 50-51.
- Span of life and average duration of life. *Natural History*, v. 26, pp. 26-30.
- The differential birth rate. *Problems of Overpopulation*, being Vol. II of *The Sixth International Neo-Malthusian and Birth Control Conference, New York, 1926*. Pp. 19-29.
- Dean Swift and the goldfish. *American Speech*, v. 1, pp. 315-316.
- Biometrical studies in pathology. IV. Statistical characteristics of a population composed of necropsied persons. *Archives of Pathology and Laboratory Medicine*, v. 1, pp. 329-347. By R. P. and Agnes L. Bacon.
- A philosopher for the bloc. *Baltimore Evening Sun*, April 6.
- Review of *Malthus and His Work* by James Bonar. *Birth Control Review*, v. 10, p. 132.
- Vital statistics of the National Academy of Sciences. V. The growth of the Academy. *Proceedings of the National Academy of Sciences*, v. 12, pp. 258-261.
- A synthetic medium for the cultivation of *Drosophila*. Preliminary note. *Journal of General Physiology*, v. 9, pp. 513-519.
- The constitutional elements in the etiology of pneumonia. *Proceedings of the Society of Experimental Biology and Medicine*, v. 23, pp. 573-576.
- Review of *The Natural Increase of Mankind* by J. Shirley Sweeney. *Saturday Review of Literature*, v. 2, p. 796.
- New data on differential fertility in the United States. *American Journal of Hygiene*, v. 6, pp. 610-616.
- Culture media for *Drosophila*. I. Changes in hydrogen ion concentration of the medium. *American Naturalist*, v. 60, pp. 347-357. By R. P. and W. B. D. Penniman.
- Culture media for *Drosophila*. II. A new synthetic medium and its influence on fertility at different densities of population. *Ibid.*, pp. 357-366. By R. P., Agnes Allen, and W. B. D. Penniman.

- Death: Why and wherefore. *Encyclopedia Britannica*, 13th Edition, v. 1, pp. 826-828. [Also reprinted in *Seven Famous Reprints from the New Thirteenth Edition of the Encyclopedia Britannica and Biographies of the Authors*. New York and London, 1927, pp. 82-93. (Biographical sketch, p. 81).]
- The revival of the population question. *Readings in Civic Sociology* (By E. A. Ross and Mary E. McCaull). New York (World Book Co.) [One page.]
- The cost of biological books in 1926. *Quarterly Review of Biology*, v. 1, pp. 606-608.
- [BOOK] Alcohol and Longevity. New York (Alfred A. Knopf, Inc.). Pp. xii + 273.
- Alcool e longevità. *Le Assicurazioni Sociali*, T. 2, No. 5, pp. 22-47.
- A time recorder for quantitative work in animal behavior. *Journal of the Washington Academy of Science*, v. 16, pp. 541-543.
- Report of the Director of the Institute for Biological Research. *Report of the President of the University, 1925-1926, Johns Hopkins University Circular No. 375*, pp. 178-182.

1927

- Bradford's Life of Darwin. *Baltimore Evening Sun*, Jan. 15.
- Note. *American Journal of Obstetrics and Gynecology*, v. 13, pp. 35-36.
- A biometric study of the relative cell volume of human blood, in normal and tuberculous males. *Bulletin of the Johns Hopkins Hospital*, v. 40, pp. 3-32. By R. P. and J. R. Miner.
- Notes on the growing of seedlings for physiological experimentation. *Proceedings of the Society for Experimental Biology and Medicine*, v. 24, pp. 439-444. By R. P. and Agnes L. Allen.
- On the distribution of differences in vitality among individuals. *American Naturalist*, v. 61, pp. 113-131. [Abstract of this paper, with same title, published in *Archives of Pathology and Laboratory Medicine*, v. 3, p. 549, 1927.]
- The graphic representation of relative variability. *Science*, v. 65, pp. 237-241.
- Differential fertility. *Quarterly Review of Biology*, v. 2, pp. 102-118.
- [BOOK] To Begin With. Being Prophylaxis against Pedantry. New York (Alfred A. Knopf, Inc.). Pp. ix + 96.
- Review of *A Statistical Study of Three Thousand Autopsies* by William Ophüls. *Archives of Pathology and Laboratory Medicine*, v. 3, pp. 742-744. [Unsigned.]
- List of dates of birth of members of the National Academy of Sciences. *Annual Report of the National Academy of Sciences Fiscal Year 1925-1926*, pp. 179-185. [Unsigned.]
- The constitutional factor in breakdown of the respiratory system. *Annals of Eugenics (London)*, v. 2, pp. 1-24, 1 plate.

- Biometrical studies in pathology. V. The racial and age incidence of cancer and of other malignant tumors. *Archives of Pathology and Laboratory Medicine*, v. 3, pp. 963-992. By R. P. and Agnes L. Bacon.
- Experimental studies on the duration of life. XI. Density of population and life duration in *Drosophila*. *American Naturalist*, v. 61, pp. 289-318. By R. P., J. R. Miner, and S. L. Parker.
- The biology of population growth. *Birth Control Review*, v. 11, pp. 236-237; 247; 260-263.
- On the summation of logistic curves. *Journal of the Royal Statistical Society (London)*, v. 90, pp. 729-746. By Lowell J. Reed and R. P.
- The biology of superiority. *The American Mercury*, v. 12, pp. 257-266.
- At last, a "family doctor book" that is honest. *Baltimore Evening Sun*, November 26.
- Bevölkningstillväxtens biologi. *Nordisk Statistisk Tidskrift*, v. 6, pp. 195-213.
- The indigenous native population of Algeria in 1926. *Science*, v. 66, pp. 593-594.
- Report of the Director of the Institute for Biological Research. *Report of the President of the University, 1926-1927. Johns Hopkins University Circular No. 385*, pp. 149-154.
- The growth of populations. *Quarterly Review of Biology*, v. 2, pp. 532-548.
- The cost of biological books in 1927. *Ibid.*, pp. 581-583.
- The biology of population growth. *Proceedings of the World Population Conference, Geneva, 1927*, pp. 22-38. [French translation under the title L'accroissement de la population au point de vue biologique (of French edition of *Proceedings*), pp. 3-25]
- Biometry and vital statistics in relation to the science of medicine. *Nelson Loose-Leaf Medicine. Prevention and Public Health*, v. 11, pp. 127-150.
- 1928
- [BOOK] The Rate of Living. Being an Account of Some Experimental Studies on the Biology of Life Duration. *New York* (Alfred A. Knopf). Pp. [16] + 185.
- New data on alcohol and duration of life. *Nature*, v. 121, pp. 15-16. By R. P. and Agnes L. Bacon.
- The length of life of the moderate drinker. *The American Mercury*, v. 13, pp. 198-200.
- The growth of seedlings of the cantaloupe, *Cucumis melo*, in the absence of exogenous food and light. *Proceedings of the National Academy of Sciences*, v. 14, pp. 1-4. By R. P., Agnes A. Winsor, and J. R. Miner.
- [BOOK] The Present Status of Eugenics. *Hanover, N. H.* (The Sociological Press). Pp. 20.
- Review of *Emergent Evolution and the Development of Societies* by W. M. Wheeler. *Baltimore Evening Sun*, April 7, p. 6.

- Self destruction. *Saturday Review of Literature*, v. 4, p. 822.
- The International Population Union. *Science*, v. 67, pp. 435-436.
- Eugenics. *Verhandlungen des V. Internationalen Kongresses für Vöererbungs-wissenschaft, Berlin*, 1927. Supplement. Bd. I, pp. 261-282.
- The population problem. I. Population growth. *Time and Tide (London)*, v. 9, pp. 482-483.
- Evolution and mortality. *Quarterly Review of Biology*, v. 3, pp. 271-280.
- Biometrical studies in pathology. VI. The primary site of cancers and other malignant tumors. *Archives of Pathology*, v. 6, pp. 67-89. By R. P. and Agnes L. Bacon.
- Ecce homo omnisciens. *Saturday Review of Literature*, v. 4, p. 999.
- Experiments on longevity. *Quarterly Review of Biology*, v. 3, pp. 391-407.
- Interim report of the proceedings of the First General Assembly of the International Union for the Scientific Study of Population Problems. *Journal of the American Statistical Association*, v. 23, pp. 306-317. [Unsigned.]
- Alcohol and life duration. *International Clinics*, 38th ser., v. 3, pp. 27-51.
- Cancer from the viewpoint of the human biologist. *Ibid.*, pp. 53-77. [Second of the 11th series of Harrington Lectures.]
- On the pathological relations between cancer and tuberculosis. *Proceedings of the Society for Experimental Biology and Medicine*, v. 26, pp. 73-75.
- Introduction. In *What is Life?*, by Augusta Gaskell. Pp. 13-17.
- The psychology of prohibition. *American Mercury*, v. 15, pp. 385-394.
- The senior fellowships of St. John's College. *School and Society*, v. 28, pp. 626-627.
- Progress report on an investigation in race pathology. *Southern Medical Journal*, v. 21, pp. 1001-1005.
- Report of the Director of the Institute for Biological Research. *Report of the President of the University, 1927-1928. Johns Hopkins University Circular No. 396*, pp. 152-161.
- Nieuwe gegevens omtrent alcohol en levensduur. *Wetenschappelijke Bladen*, Bd. 2, pp. 67-70. By R. P., and Agnes L. Bacon.
- The cost of biological books in 1928. *Quarterly Review of Biology*, v. 3, pp. 600-603.
- The form of the growth curve of the cantaloupe (*Cucumis melo*) under field conditions. *Proceedings of the National Academy of Sciences*, v. 14, pp. 895-901. By R. P., Charles P. Winsor, and Florence B. White.

1929

- Experimental studies on the duration of life. XII. Influence of temperature during the larval period and adult life on the duration of life of the imago of *Drosophila melanogaster*. *American Naturalist*, v. 63, pp. 37-67. By W. W. Alpatov, and R. P.

- Dictionary of American Biography, source book for human biology. *Baltimore Evening Sun*, January 12.
- Zur Psychologie des Alkoholverbots. *Das Tage Buch*, July 10, Heft 1, pp. 7-12.
- Statistical report on the first year's operations of the Bureau for Contraceptive Advice. *First Report of the Bureau for Contraceptive Advice, Baltimore, 1929*, pp. 2-6.
- "Human Biology." *Science*, v. 69, pp. 132-133.
- Cancer and tuberculosis. *American Journal of Hygiene*, v. 9, pp. 97-159.
- Science, metaphysics and blood. *Science*, v. 69, pp. 161-163.
- The International Union for the Scientific Investigation of Population Problems. *Eugenical News*, v. 14, pp. 18-21.
- Foreword. *Human Biology*, v. 1, No. 1, pp. 1-3.
- Studies on constitution. I. Methods. *Ibid.*, pp. 10-56. By R. P., Alan C. Sutton, W. T. Howard, Jr., and Margaret G. Rioch.
- A note on the mortality of brewery employees. *Ibid.*, pp. 136-138.
- Mr. Cranium's lecture. *Ibid.*, pp. 139-142.
- Recent literature useful in the study of human biology. *Ibid.*, pp. 144-152; 286-304; 431-444; 572-588.
- The International Union for the Scientific Investigation of Population Problems. *Johns Hopkins Alumni Magazine*, v. 17, pp. 226-232.
- Births and deaths. *Baltimore Evening Sun*, March 2, p. 8. [Unsigned.]
- The population of an area around Chicago and the Logistic curve. *Journal of the American Statistical Association*, v. 24, pp. 66-67. By R. P., and L. J. Reed.
- The new Britannica—a unique record of civilization. In *The New Britannica, 14th Edition*. New York, pp. 13-15.
- Age changes in alcohol tolerance in *Drosophila melanogaster*. *Proceedings of the National Academy of Sciences*, v. 15, pp. 425-429. By R. P., Florence B. White, and J. R. Miner.
- Experimental treatment of cancer with tuberculin. *Lancet*, v. 216, pp. 1078-1080. By R. P., Alan C. Sutton, and W. T. Howard, Jr.
- Biological factors in Negro mortality. *Human Biology*, v. 1, pp. 229-249.
- A note on the association of diseases. *Science*, v. 70, pp. 191-192.
- Editorial note. *Quarterly Review of Biology*, v. 4, p. 297.
- Introductory note. *Bulletin of the International Union for the Scientific Study of Population Problems*, v. 1, No. 1, p. 1. [Unsigned.]
- Death, Biological aspects of. *Encyclopedia Britannica, 14th Edition*, v. 7, pp. 110-112.
- Changes in the incidence of mortality at advanced ages. *Human Biology*, v. 1, pp. 558-561.
- Constitutional somatology. *Ibid.*, pp. 283-284.
- Dr. John Cross on physiognomy and constitution. *Ibid.*, pp. 426-430.
- John Hunter on appetites and aging. *Ibid.*, pp. 565-571.

Report of the Director of the Institute for Biological Research. *Report of the President of the University, 1928-1929. Johns Hopkins University Circular No. 407*, pp. 173-187.

1930

- Alcohol. Biological aspects. *Encyclopedia of the Social Sciences*, v. 1, pp. 620-622.
- Some Aspects of the Biology of Human Populations. *Human Biology and Racial Welfare* (Edited by E. V. Cowdry and published by Paul R. Hoeber, Inc., New York), pp. 515-552.
- Cobbes Questions and Answers, 1614. *Human Biology*, v. 2, pp. 137-144.
- [BOOK] To Begin With. Being Prophylaxis Against Pedantry. Revised and Enlarged Edition. *New York* (Alfred A. Knopf, Inc.). Pp. [16 unnumbered] + 123.
- Recent literature useful in the study of human biology. *Human Biology*, v. 2, pp. 145-158; 292-302; 441-456; 569-581.
- Requirements of a proof that natural selection has altered a race. *Scientia*, v. 47, pp. 175-186. [Translated into French by Henry de Varigny: *Que faut-il pour prouver que la sélection naturelle a modifié une race? Supplement, Scientia*, v. 47, pp. 84-94.]
- Statistical report on the second year's operation of the Bureau for Contraceptive Advice. *Second Report of the Bureau for Contraceptive Advice, Baltimore*, pp. 2-10.
- Skepticism reconciled. *Saturday Review of Literature*, v. 6, p. 1090.
- Biological Factors in Negro Mortality. *The Negro in American Civilization* (By Charles S. Johnson, published by Henry Holt and Co., New York), pp. 413-431.
- The logistic curve and the census count of 1930. *Science*, v. 72, pp. 399-401. By R. P. and L. J. Reed.
- [BOOK] Alcohol und Lebensdauer. *Hannover* (Norddeutsches Druck- und Verlagshaus). Pp. 263.
- [BOOK] Introduction to Medical Biometry and Statistics. Second Edition, Revised and Enlarged. *Philadelphia and London* (W. B. Saunders Co.). Pp. 459.
- Report of the Director of the Institute for Biological Research. *Report of the President of the University 1929-1930. Johns Hopkins University Circular No. 419*, pp. 168-178.
- An eighteenth century evolutionist. *Human Biology*, v. 2, pp. 559-566.
- The history of a gesture. *Ibid.*, pp. 566-568.

1931

- The Life, Letters and Labours of Francis Galton. *Science*, v. 73, pp. 238-240.
- Longevity: a pedigree. *Human Biology*, v. 3, pp. 133-137.
- Harvey's post-mortem examination of Thomas Parr. *Ibid.*, pp. 138-142.

- Recent literature useful in the study of human biology. *Ibid.*, pp. 143-156; 289-301; 442-458; 586-600.
- Statistical report on the third year's operations of the Bureau for Contraceptive Advice. *Third Report of the Bureau for Contraceptive Advice, Baltimore*, pp. 4-14.
- Superficie, population et religions de la terre. *Journal de la Société de Statistique de Paris*, T. 72, p. 143.
- Studies on human longevity. IV. The inheritance of longevity. Preliminary report. *Human Biology*, v. 3, pp. 245-269.
- Erratum. *Ibid.*, p. 288.
- Alcool e biologia umana. *Scritti biologici*, T. 6, pp. 1-12.
- Report of President at the Second General Assembly of the International Union for the Scientific Investigation of Population Problems. *Bulletin of the International Union for the Scientific Investigation of Population Problems*, v. 2, pp. 49-53.
- Some notes on the Census of Religious Bodies, 1926. *Journal of Social Psychology*, v. 2, pp. 417-432.
- A fine survey of biology. *Baltimore Evening Sun*, November 14, p. 6.
- On the alleged lethal effects of sexual continence in the Holy Land. *Human Biology*, v. 3, pp. 577-585.

1932

- Studies on human longevity. V. Constitutional factors in mortality at advanced ages. *Human Biology*, v. 4, pp. 80-118. By R. P. and T. Raenkham.
- An explanatory note regarding a more detailed classification of recent literature useful in the study of human biology. *Ibid.*, pp. 131-133.
- Recent literature useful in the study of human biology. *Ibid.*, pp. 133-153; 289-305; 435-451; 584-602.
- Statistical report on the fourth year's operations of the Bureau for Contraceptive Advice. *Fourth Report of the Bureau for Contraceptive Advice, Baltimore*, pp. 3-15.
- A table for ascertaining elapsed time in years and decimals of a year between any two dates. *Milbank Memorial Fund Quarterly Bulletin*, v. 10, pp. 151-154. By R. P., and J. R. Miner.
- Report on funds for publication of research. *Annual Report of the National Academy of Sciences, Fiscal Year 1930-1931*, pp. 20-27. By E. G. Conklin, A. L. Day, O. Veblen, and R. P.
- Variation in *Goniobasis virginica* and *Auculosa carinata* under natural conditions. I. The problem, material, and methods. *Biologia Generalis*, v. 8, pp. 607-630. Plates XIV and XV. By Joshua L. Bailly, Jr., R. P., and C. P. Winsor.
- The influence of density of population upon egg production in *Drosophila melanogaster*. *Journal of Experimental Zoology*, v. 63, pp. 57-84.
- Contraception and fertility in 2,000 women. *Human Biology*, v. 4, pp. 363-407.



Some data on fertility and economic status. *Ibid.*, pp. 525-553.  
 Tobias Venner and his Via Recta. *Ibid.*, pp. 558-583.

1933

- Preliminary notes on a cooperative investigation of family limitation. *Milbank Memorial Fund Quarterly Bulletin*, v. 11, pp. 37-60.
- Statistical report on the fifth year's operations of the Bureau for Contraceptive Advice. *Fifth Report of the Bureau for Contraceptive Advice, Baltimore*, pp. 5-17.
- Available food, relative growth and duration of life in seedlings of *Cucumis melo*. *Proceedings of the National Academy of Sciences*, v. 19, pp. 228-233. By Sophia A. Gould, R. P., Thomas I. Edwards, and J. R. Miner.
- Recent literature useful in the study of human biology. *Human Biology*, v. 5, pp. 135-154; 295-312; 520-540; 722-740.
- Professors go trending. *Baltimore Evening Sun*, March 1, p. 15.
- America today and maybe tomorrow. *Quarterly Review of Biology*, v. 8, pp. 96-101.
- The way of the reformer. *The Nation*, v. 136, pp. 588-589, May 24.
- Variation in *Goniobasis virginica* and *Anculosa carinata* under natural conditions. II. The relation between size of the shells and environmental factors. *Biologia Generalis*, v. 9, pp. 301-336, plates VI-VIII. By Joshua L. Baily, Jr., R. P., and C. P. Winsor.
- The inheritance of longevity. *Explorations in Science, Schenectady, N. Y.* (Research Laboratory, General Electric Co.) Pp. 73-75. [Text of radio broadcast.]
- The Rotarian hoof. *American Mercury*, v. 29, p. 499. [Signed String-fellow Coolidge.]
- Factors in human fertility and their statistical evaluation. *The Lancet*, v. 225, pp. 607-611.
- Variation in *Goniobasis virginica* and *Anculosa carinata* under natural conditions. III. Correlations, shape of shells, and conclusions. *Biologia Generalis*, v. 9, 2 Hälfte, pp. 48-69. By J. L. Baily, Jr., R. P., and C. P. Winsor.
- A classification and code of occupations. *Human Biology*, v. 5, pp. 491-505.
- [BOOK] Constitution and Health. London (Kegan Paul, Trench, Trübner and Co.). Pp. 97. [Psyche Miniatures, General Series, No. 60.]
- On the frequency of the use of contraceptive methods, and their effectiveness as used by a sample of American women. *XXI<sup>e</sup> Session de l'Institut Internationale de Statistique*, Sect. I. Comm. Pp. 20.

1934

- Studies on human longevity. VI. The distribution and correlation of variation in the total immediate ancestral longevity of nonagenarians and centenarians, in relation to the inheritance of duration of life. *Human Biology*, v. 6, pp. 98-222. By R. P. and Ruth DeWitt Pearl.

- Recent literature useful in the study of human biology. *Ibid.*, pp. 241-270; 408-430; 564-593; 722-737.
- Review of *La fertilità dei biotipi. Saggio di demografia costituzionalistica* by Marcello Boldrini. *American Journal of Sociology*, v. 39, pp. 709-712.
- Aeration and growth of cantaloupe seedlings. *American Journal of Botany*, v. 21, pp. 242-250. By R. P., T. I. Edwards, Agnes A. Winsor, and C. P. Winsor.
- The growth of *Cucumis melo* seedlings at different temperatures. *Journal of General Physiology*, v. 17, pp. 687-700. By R. P., T. I. Edwards, and J. R. Miner.
- Contraception and fertility in 4945 married women. A second report on a study of family limitation. *Human Biology*, v. 6, pp. 355-401.
- [BOOK] *The Ancestry of the Long-Lived*. Baltimore and London (The Johns Hopkins Press; Humphrey Milford, Oxford University Press). Pp. xiv + 168. By R. P. and Ruth DeWitt Pearl.
- Constitutional factors in longevity. *Zeitschrift für Morphologie und Anthropologie*, Bd. 34, pp. 314-320. [Eugen Fischer-Festband.]
- [Remarks in a Symposium on Science and Industry in the Coming Century. Chicago, May 25, 1934.] *Scientific Monthly*, v. 39, pp. 76-77.
- Scientists into philosophers. *Baltimore Evening Sun*, August 25.
- Second progress report on a study of family limitation. *Milbank Memorial Fund Quarterly*, v. 12, pp. 248-269.
- On the effects of partial removal of the cotyledons upon the growth and duration of life of cantaloupe seedlings without exogenous food. *Annals of Botany*, v. 48, pp. 575-599. By Sophia A. Gould, R. P., T. I. Edwards, and J. R. Miner.
- Influence of temperature and nutrition on the growth and duration of life of *Cucumis melo* seedlings. *Botanical Gazette*, v. 96, pp. 118-135. By T. I. Edwards, R. P., and S. A. Gould.
- Foreword. *Working Dogs* by Elliott Humphrey and Lucien Warner. Baltimore (Johns Hopkins Press).
- The weight of the Negro brain. *Science*, v. 80, pp. 431-434.
- L'organisation et la travail de la section de biologie à l'École d'Hygiène et de Santé Publique de l'Université Johns Hopkins. *Biotypologie*, T. 2, pp. 105-122.
- The dynamics of population. *Science*, v. 80, pp. 504-505.
- Foreword. *The Struggle for Existence* by G. F. Gause. Baltimore (Williams and Wilkins Co.), pp. v-vi.
- Studies on constitution. II. Somatological differences associated with diseases of the heart in white males. *Human Biology*, v. 6, pp. 650-713. By R. P., and Antonio Ciocco. [No. III in the series of Studies on constitution was by Antonio Ciocco alone, and hence does not appear in the present bibliography.]

1935

- What are your chances of living a long time? *Cosmopolitan*, v. 98, pp. 44-45 and 181.
- On the comparison of groups in respect of a number of measured characters. *Human Biology*, v. 7, pp. 95-107. By R. P. and J. R. Miner.
- Recent literature useful in the study of human biology. *Ibid.*, pp. 121-150; 272-301; 443-467; 616-633.
- How long will you live? *Forum*, v. 93, pp. 172-173.
- The business of living a long time. *Reader's Digest*, v. 26, No. 155, pp. 59-62.
- Experimental studies on the duration of life. XIV. The comparative mortality of certain lower organisms. *Quarterly Review of Biology*, v. 10, pp. 60-79. By R. P. and J. R. Miner.
- Biology and human trends. *Journal of the Washington Academy of Sciences*, v. 25, pp. 253-272. [Reprinted in 1936, with slight alterations, in *Smithsonian Institution Annual Report for 1935*, pp. 327-344.]
- Human biology in schools and colleges. *School and Society*, v. 42, pp. 111-118.
- A biometric study of the endocrine organs in relation to mental disease. Part I. *Human Biology*, v. 7, pp. 350-391. By R. P., Marjorie Gooch, and Walter Freeman.
- Dr. Carrel ponders the nature and soul of man. *New York Times Book Review*, September 29, pp. 3 and 23.
- Birth rate in recent years. *The World Today* (New York, Encyclopedia Britannica), v. 3, pp. 27-29.
- On the incidence of tuberculosis in the offspring of tuberculous parents. *Science*, v. 82, pp. 539-540.
- A biometric study of the endocrine organs in relation to mental disease. Part II. *Human Biology*, v. 7, pp. 555-607. By R. P., Marjorie Gooch, and Walter Freeman.

1936

- Biology and human progress. *Harpers Magazine*, v. 172, pp. 225-235.
- War and overpopulation. *Current History*, v. 43, No. 6, March.
- Studies on constitution. IV. Endocrine organ weights and somatological habitus types. *Human Biology*, v. 8, pp. 92-125. By R. P., Marjorie Gooch, J. R. Miner, and Walter Freeman.
- Recent literature useful in the study of human biology. *Ibid.*, v. 8, pp. 134-160; 288-308; 459-487; 617-642.
- Multiplying man. *Yale Review*, v. 25, pp. 584-602.
- Historical papers in the journal "Human Biology." *Isis*, v. 24, pp. 415-418.
- Fertility and contraception in urban whites and Negroes. *Science*, v. 83, pp. 503-506.
- On the incidence of tuberculosis in the offspring of tuberculous parents. *Zeitschrift für Rassenkunde*, Bd. 3, pp. 301-307.

- Third progress report on a study of family limitation. *Milbank Memorial Fund Quarterly*, v. 14, pp. 258-284.
- Foreword. *Contraception as a Therapeutic Measure* by Bessie L. Moses. (Published by Williams and Wilkins Co., Baltimore), pp. xi-xiii.
- Constitutional factors in diseases of the cardiovascular-renal system. *Proceedings of the 26th Annual Meeting of the Medical Section of the American Life Convention*, pp. 12-38.
- Review of *An American Doctor's Odyssey* by Victor Heiser. *Baltimore Evening Sun*, September 5, p. 6. [Reprinted, under the title "On doing something for your fellow man," in *Atlantic City, N. J., Union*, September 16.]
- World population growth. *Human Biology*, v. 8, pp. 399-419. By R. P., and Sophia A. Gould.
- Bodily habitus and endocrine pattern. *American Journal of Physical Anthropology*, v. 21, No. 2, Supplement, p. 9.
- The comparative fertility of white and Negro women in American cities. *Ibid.*, p. 15.
- Experimental studies on the duration of life. XV. Life tables for the pecan nut case bearer, *Acrobasis caryae* Grote. *Mémoires du Musée Royal d'Histoire Naturelle de Belgique*, 2<sup>m</sup>e Serie, Fascicule 3 (Mélanges Paul Pelseeneer), pp. 169-184, 1 plate.
- Biology. A Correlated Curriculum. *New York and London* (Appleton-Century), p. 299.
- Biological factors in fertility. *Annals of the American Academy of Political and Social Science*, v. 188, pp. 14-25.
- Karl Pearson, 1857-1936. *Journal of the American Statistical Association*, v. 31, pp. 653-664.
- Potential and actual reproductive performance in man. *Human Biology*, v. 8, pp. 508-530.
- The prices of biological books in 1936. *Quarterly Review of Biology*, v. 11, pp. 492-494. By R. P., and Maud D. Pearl.

1937

- On biological principles affecting populations; human and other. *American Naturalist*, v. 71, pp. 50-68.
- Constitution et santé. Traduit de l'anglais par L. Cassin. *Biotypologie*, T. 4, pp. 1-52. [French translation of the book *Constitution and Health*, published in 1933.]
- Krieg und Übervölkerung. (Übersetzt und mit einigen Anmerkungen versehen von Adolf Meyer). *Zeitschrift für Geopolitik*, Jahrg. 14, Heft 1, pp. 31-39. [German translation of *War and overpopulation*, 1936.]
- Variation in parity of women bearing children in the U. S. Birth Registration Area in 1930. Part I. *Human Biology*, v. 9, pp. 65-98.

- Recent literature useful in the study of human biology. *Ibid.*, pp. 108-132; 253-280; 419-449; 572-595.
- Fertility and contraception in New York and Chicago. *Journal of the American Medical Association*, v. 108, pp. 1385-1390.
- Variation in parity of women bearing children in the U. S. Birth Registration Area in 1930. Part II. *Human Biology*, v. 9, pp. 212-244.
- On the weight of the parathyroids. *Ibid.*, pp. 245-250.
- Specific fertility and contraceptive rates in New York City and Chicago. *American Journal of Hygiene*, v. 25, pp. 507-519.
- On the moment product-sums of curtate frequency distributions. *Human Biology*, v. 9, pp. 410-416.
- Human biology. *University of Michigan Official Publications*, v. 39, No. 50, pp. 12-13.
- Progress in the biological sciences. *A University between Two Centuries. The Proceedings of the 1937 Celebration of the University of Michigan.* Ann Arbor (University of Michigan Press), pp. 233-259.
- The prices of biological books in 1937. *Quarterly Review of Biology*, v. 12, pp. 504-506. By R. P. and Maud D. Pearl.

1938

- Biology. *Encyclopedia Americana*, 1938 Edition, v. 3. Pp. (of reprint) 12.
- Recent literature useful in the study of human biology. *Human Biology*, v. 10, pp. 151-180; 300-326; 426-455; 580-606.
- Tobacco smoking and longevity. *Science*, v. 87, pp. 216-217. [This paper constitutes No. VII in the series "Studies on human longevity."]
- The search for longevity. *Scientific Monthly*, v. 46, pp. 462-483. [Also reprinted in *Landmarks in Medicine, New York and London* (D. Appleton-Century), 1939, pp. 231-282.]
- Some notes on the contributions of Dr. John Shaw Billings to the development of vital statistics. *Bulletin of the Institute of the History of Medicine*, v. 6, pp. 387-393.
- Foreword. *Youth and Sex. A Study of 1300 College Students*, by Dorothy Dunbar Bromley and Florence Huxton Britten. *New York* (Harpers), pp. xi + xiii.
- The search for longevity. *Diplomate*, v. 10, pp. 92-93.
- Of human folly. *Quarterly Review of Biology*, v. 13, pp. 336-342.
- Long life and living. *Proceedings of the Institute of Medicine of Chicago*, v. 12, pp. 170-172.
- Economic status, differential fertility and contraception as observed in the population of large cities of the United States. *Congrès International de la Population, Paris 1937*. T. 5, pp. 81-96.
- Anthologia anthropologica. *Human Biology*, v. 10, pp. 576-577.
- The prices of biological books in 1938. *Quarterly Review of Biology*, v. 13, pp. 491-493. By R. P. and Maud D. Pearl.

1939

- [BOOK] The Natural History of Population. *London and New York* (Oxford University Press). Pp. xii + 416. [Heath Clark Lectures, University of London, delivered in 1937.]
- Review of *Political Arithmetic: A Symposium of Population Studies*. Edited by Lancelot Hogben. *The Political Quarterly* (London), v. 10, pp. 135-138, January-March No.
- Records of total reproduction. *Human Biology*, v. 11, pp. 144-146.
- Recent literature useful in the study of human biology. *Ibid.*, pp. 148-172; 290-318; 410-446; 550-579.
- Between two centuries. *American Statistical Association Bulletin*, v. 1, pp. 41-44.
- Review of *Mathematical Biophysics. Physicomathematical Foundations of Biology*, by N. Rashevsky. *Bulletin of the American Mathematical Society*, March No., pp. 223-224.
- Patterns for living together. *Harper's Magazine*, v. 178, pp. 595-604.
- The evolution of sociality. *Ecology*, v. 20, pp. 305-310.
- What's happening to world population? *Science Digest*, v. 5, No. 6, pp. 8-14.
- Studies on human longevity. VIII. Bodily constitution and longevity. *Proceedings of the National Academy of Sciences*, v. 25, pp. 609-616. By R. P. and W. Edwin Moffett. [Authors' abstract: Bodily constitution and longevity. *Science*, v. 90, p. 406.]
- Foreword to *Physiological Group Differentiation in Lymnaea columella*, by Joshua L. Baily, Jr. P. v.
- The prices of biological books in 1939. *Quarterly Review of Biology*, v. 14, pp. 500-502. By R. P. and Maud D. Pearl.

1940

- Recent literature useful in the study of human biology. *Human Biology*, v. 12, pp. 121-140; 287-312; 432-455; 567-592.
- Jewish and Christian intermarriages in Budapest: A footnote to recent social history. *Bulletin of the History of Medicine*, v. 8, pp. 497-508. By R. P. and Celeste Franklin.
- An index of body build. *American Journal of Physical Anthropology*, v. 26, pp. 315-348.
- The aging of populations. *Journal of the American Statistical Association*, v. 35, pp. 277-297.
- Biological aspects of death. *Encyclopedia Britannica*, v. 7, pp. 110-112B.
- [BOOK] Introduction to Medical Biometry and Statistics. Third Edition, revised and enlarged. *Philadelphia and London* (W. B. Saunders Co.). Pp. xv + 537.
- A comparative examination of certain aspects of the populations of the New World. *Human Biology*, v. 12, pp. 359-402.
- The logistic curve and the census count of 1940. *Science*, v. 92, pp. 486-488. By R. P., L. J. Reed and J. F. Kish.

RAYMOND PEARL—JENNINGS

Pregnancy rates and coitus rates. *Human Biology*, v. 12, pp. 545-558.  
The prices of biological books in 1940. *Quarterly Review of Biology*,  
v. 15, pp. 513-516. By Maud D. Pearl and R. P.

1941

Experimental studies on the duration of life. XVI. Life tables for the  
flour beetle *Tribolium confusum* Duval. *American Naturalist*, v. 75,  
pp. 5-19. By R. P., Thomas Park, and John R. Miner.  
Some biological considerations about war. *American Journal of Sociology*,  
v. 46, pp. 487-503.