

History of Bacteriology at Purdue University

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The development of Bacteriology at Purdue University has followed the general pattern set by Pasteur and Koch. The diseases of animals were first considered. We find in the University catalog for the year 1893, a course offered in Veterinary Science by Professor A. W. Bitting in which the diseases of animals due to bacterial infections were considered. It would be assumed that this consideration was very incidental, as the description of the course stresses at great length the question of surgery and pathology.

In 1894 the following outline is given in the catalog: "Bacteriology.—Twelve Weeks. The general morphology and classification of the bacteria, their development and most important biological relations are studied. The laboratory work includes the general methods of research, and also such special forms of investigation, i.e., the biological analysis of water, etc., as members of the class may desire. Professor Arthur."

Dr. J. C. Arthur was Professor of Botany and later acquired international fame in the field of Mycology. He was an authority on rusts and his books on the subject are still the classical references.

In 1895 there were two courses described that belong to the general field of Bacteriology: "Biology 6: Fermentation. Twenty-three weeks, eight hours per week. Preliminary study of yeasts, moulds and bacteria leading to the morphological and physiological study of organisms found in bread, beer, cider, moulding fruits, milk, prepared foods on the market, etc. The work is of a practical nature, and is designed to give a student a working knowledge of the problems affecting foods. Jorgensen's Microorganisms of Fermentation is used in connection with other standard works, as text. Instructor Golden."

Miss Katherine Golden later married Dr. A. W. Bitting, who became Food Technologist in the Bureau of Chemistry, U. S. Department of Agriculture and later was connected with the National Canners Association, leaving this concern to become a consulting Food Technologist. No doubt Mrs. Bitting had no small part to play in these various endeavors. Dr. Bitting has since retired and lives in Lafayette, Indiana.

In that same year, 1895, we find another entry in the catalog entitled Biology 11. "Bacteriology: Thirty-seven weeks, eight hours per week. A general course, utilizing the modern methods of culture for the study of bacteria, and bearing particularly upon the bacteriological examination of water, sewage, ice, air, soil, milk, butter, etc., and the application of such results in the solution of modern sanitary problems. The members of the class make reports once a week on current articles bearing on this subject that appear in scientific periodicals. Instructor Burrage."

When Dean Stanley Coulter found that this new development in biology required special training that was not offered in courses in

Botany, he asked Dr. Severance Burrage, a recent graduate of Massachusetts Institute of Technology, to join the biological staff. His training was primarily along Public Health lines and the description of the course bears this out. From Purdue, Dr. Burrage went to Eli Lilly and then to the University of Colorado. He has since retired.

It is interesting to note that whereas Bacteriology was taught by botanists at the beginning we now see the process reversed. Dr. Burrage taught two courses in Botany as well as six courses in Bacteriology before his Purdue career ended. He taught students majoring in Agriculture, Biology, Household Economy and Civil Engineering.

From this meagre beginning, bacteriology developed at Purdue University as the need arose. In the Department of Veterinary Science, where its applications could be most readily used, there were two bacteriologists employed following the resignation of Dr. A. W. Bitting. Dr. R. A. Craig, a graduate of Iowa State College, came to Purdue in 1899 as Head of the Department. His specialty was diseases of swine, particularly hog cholera; a knowledge of bacteriology was essential for his work. He died in 1939.

It was Dr. Craig who was responsible for bringing Dr. R. A. Whiting to Purdue as bacteriologist and pathologist in the Veterinary Department. Dr. Whiting did no teaching but was very busy doing experimental work and directing undergraduate students in their research for their theses which were then required of all students.

In 1912 the Dairy Department felt the need of bacteriology to further their work with milk and its various products. H. B. Switzer, a recent Cornell graduate, developed the beginning courses in Dairy Bacteriology. He was Assistant Professor from 1915 to 1917 at which time he left Purdue University to become associated with the U. S. Department of Agriculture. At the present time he is in charge of the Inspection of Food Plants carrying Good Housekeeping seals of approval.

Professor Switzer was followed by H. M. Weeter, who remained at Purdue only one year. He taught General Dairy Bacteriology and went to the University of Louisville from here.

From 1917 to 1921 there were no bacteriologists connected with the Dairy Department. In 1921, E. H. Parfitt came to Purdue from the U. S. Department of Agriculture. He obtained his Ph.D. degree from Iowa State College in 1934, returning to Purdue where he remained until 1940. He is now connected with the Evaporated Milk Association.

There were three graduate students in the Dairy Department during Dr. Parfitt's tenure. Leonard R. Dowd, a Michigan State College graduate and M. S. Purdue University, 1932, replaced Dr. Parfitt in 1932-1933 during the latter's leave of absence. He went to Connecticut State College, where he is connected with the Dairy Department.

F. J. Babel did some graduate work at Purdue University in 1935-1936, leaving to become Research Associate in the Dairy Department at Iowa State College. He was followed by W. H. Brown in 1936, who remained here until 1943. Mr. Brown is now doing control work with the City Board of Health of Jacksonville, Florida.

Dr. P. R. Elliker of the University of Wisconsin filled the vacancy created by the resignation of Dr. Parfitt.

The Horticultural Department employed a bacteriologist for a few years. H. A. Noyes, a graduate of Massachusetts College of Agriculture, came to Purdue in 1913 and was Research Associate in the Agricultural Experiment Station until 1917, when he left Purdue to engage in bacteriological research work with the Welch Grape Juice Company.

The Department of Botany in the Agricultural Experiment Station has a soil bacteriologist as a member of its staff. Dr. J. L. Roberts from Wisconsin, was made associate in 1937.

In 1912, the vacancy created by the resignation of Dr. Burrage was filled by Professor C. M. Hilliard. Like Dr. Burrage, Professor Hilliard was trained at the Massachusetts Institute of Technology and was primarily interested in Public Health. He resigned in 1914 to become head of the Department of Public Health at Simmons College in Boston, which position he still holds.

During the tenure of Professor Hilliard, the first assistant in Bacteriology, T. J. Murray, a graduate of the College of the City of New York, 1913, was employed. He obtained his M.S. degree in 1915 and accepted a position as Associate Professor at Virginia Polytechnic Institute. He is now Professor of Bacteriology at Rutgers.

Dr. C. A. Behrens replaced Professor Hilliard in 1914, coming to Purdue from Michigan, where his training was obtained under the direction of Dr. F. G. Novy. He was well grounded in the fundamentals of Bacteriology and we find a transition taking place at Purdue dating from this time. Public Health was gradually replaced by the more exact science, Bacteriology. The equipment at this time was not extensive for the kind of work that Dr. Behrens wished to carry on, and we find him struggling along for the first two or three years with very little. The courses in Public Health were gradually replaced by courses in Pathogenic organisms, Serology and Immunology and Technique.

At the present time besides Dr. Behrens, there are two professors and one instructor in the division of bacteriology. P. A. Tetrault came to Purdue from Clark University in 1912 as assistant in General Biology. In 1917 he was advanced to Assistant Professor of Bacteriology and taught in the general field until 1923, when he went to the Pasteur Institute for a year's study with Professor August Fernbach along fermentation lines. Wisconsin granted him the Ph.D. degree in 1929. He developed the field of fermentation at Purdue.

S. E. Hartsell, a Michigan State graduate, was made a member of the Purdue staff in 1936. His M.S. and Ph.D. degrees were obtained at Yale University under the direction of Dr. Leo F. Rettger. Before coming to Purdue he taught at Battle Creek College and was in the Agricultural Experiment Station at Connecticut State College. He has developed the work in Food Bacteriology and is interested in the immunology of poultry.

J. M. Rush now holds the position of Instructor in Bacteriology. He is a graduate of Indiana University, 1928, and completed his work for the M.S. degree at Illinois in 1935.

As any historical review is a record of the achievements of the various members of the organization, a brief summary of the accomplishments of the assistants who have gone through the department and the members of the staff who have come and gone will not be out of place. The list is a rather long one and only a short sketch of each can be included.

Many of the assistants went on to schools of medicine after obtaining their M.S. degrees. In that list we find R. B. Robertson, (M.S. 1924), D. W. Creel, (M.S. 1926), R. E. Carmen, (M.S. 1927), L. J. Holliday, (M.S. 1928) and Miriam Smith, (M.S. 1930). All of these were Purdue graduates and are now practicing physicians. M. A. Jacobson came to Purdue from West Virginia and after obtaining his M.S. degree in 1918 went to Chicago Medical where he was granted both Ph.D. and M.D. degrees. He is a colonel in the U. S. Army.

George Stuppy spent the years 1921-1922 in the Department of Bacteriology after obtaining his bachelor's and master's degrees from Purdue. He went to Chicago and obtained both the Ph.D. and M.D. degrees from that institution. After three years teaching at Texas A. and M. as bacteriologist, he returned to the University of Chicago as instructor in Hygiene and Bacteriology. He is now practicing medicine.

Russell Greenwood obtained his M.S. degree in 1930 after completing his undergraduate work here. After two years as an instructor in Bacteriology he went to the University of Pennsylvania Medical School, where he was granted the M.D. degree. Upon graduation he went to Rutgers College as half-time Professor in Bacteriology and half-time in the Student Health Service.

W. E. Scheunemann and J. F. Brown, both recent recipients of the M.S. degree, the former from Wisconsin and the latter from Arkansas, are at present attending medical school.

Two of the assistants with M.S. degrees from Purdue have become hospital technicians. C. E. Heaton, a Purdue graduate of 1928 and M.S. 1930, is now located at the Hackensack hospital in New Jersey. F. L. Willis, graduate of Indiana State College in 1929, became technician for the Student Health Service after getting his M.S. degree and serving three years as instructor. He is now a captain in the Sanitary Corps.

In the field of Pharmacy we find two former assistants. L. B. Morgan came to Purdue from Oregon State College in 1930 and obtained his M.S. degree in 1931. He went back to the state of Oregon and is now conducting his own business. J. A. Shrader, a graduate in Pharmacy at Purdue in 1930, was granted his M.S. degree in 1932 and went into the pharmacy business in the southern part of the state. He is now with the Department of Public Health of Kentucky at Lexington.

G. D. Kennedy, a Purdue graduate, went into pharmaceutical work after two years assistantship.

In the teaching field there are several Purdue assistants who have made their mark. I. L. Baldwin, a Purdue graduate of 1918, came back to Purdue as assistant in Bacteriology after serving a year in the Army. He obtained his M.S. degree in 1921, was retained as instructor and was later promoted to Assistant Professor. He developed the courses in Soil

Bacteriology. In 1925 he went to Wisconsin, where he was granted the degree of Doctor of Philosophy in 1927, returning to Purdue as bacteriologist in the Agricultural Experiment Station and from there was called back to Wisconsin, where he has held the positions of Professor of Bacteriology, Assistant Dean of the School of Agriculture, and now Head of the Division of Agricultural Bacteriology. He was secretary of the Society of American Bacteriologists for many years, its vice president for one year, and is now its president.

A. W. Tallman, a 1928 Purdue graduate, was granted the degree of Master of Science in 1930 and then left to fill a position with the Michigan State Board of Health. From there he went into the field of biologicals and is now located at Western Reserve in the teaching field.

H. F. Marsh obtained his M.S. degree in 1931, coming to Purdue from Indiana State College. For a few years after leaving here he was connected with a Biological firm in Cincinnati and from there went to Ohio State University, where he was granted the degree of Doctor of Philosophy. He is teaching Bacteriology at Oklahoma.

L. B. Schweiger, a Purdue graduate, assisted in Bacteriology in 1936 and 1937. After getting his Master's degree he went to Arkansas where he taught Bacteriology in the School of Agriculture. He has completed the preliminary requirements for the Ph.D. degree at Purdue and will be a candidate for the degree when he returns from the Sanitary Corps.

G. C. Wickwire, a 1920 Purdue graduate, obtained his M.S. degree in 1922 and went to Illinois, where he is teaching Physiology.

The fermentation field has absorbed a long list of our graduates. C. H. Keipper, who graduated from Purdue and assisted in Bacteriology in 1926 and 1927, accepted a fellowship at Wisconsin after receiving his M.S. at Purdue. He was granted the Ph.D. degree in 1930 and left to become head of production at the Red Star Yeast Company in Milwaukee.

W. L. Weis, Purdue 1929 and M.S. 1932, went to Hiram Walker and Sons, Inc. and is now with the Schenley distilleries at Lawrenceburg. J. F. Barker, Purdue 1933 and M.S. 1935, went to The Terre Haute Brewing Corporation. G. E. Hines, Purdue 1936 and M.S. 1938, was employed by Lederle Laboratories, Inc., and later by Commercial Solvents Corporation at Terre Haute, where he is now located and heading the research on Penicillin.

H. C. Murray, Purdue 1937 and M.S. 1939, stayed at Purdue to complete his work for the Ph.D. degree. He was granted that degree in 1941 and was called to The Upjohn Company to work in the research department. His work on Penicillin was of such a nature that he was made head of production for Penicillin. He is assisted in this work by S. M. Morrison (B.S. Massachusetts State, 1941; M.S. Purdue, 1942).

H. Piersma left Lederle Laboratories, Inc., in 1935 to become instructor in Bacteriology at Purdue. He was granted the degree of Doctor of Philosophy in 1939 and returned to Lederle Laboratories Inc. After three years with this firm he resigned to go to The Upjohn Company in their research department.

M. T. Walton, B.S. 1932 and M.S. 1933, is now head of production at the Peoria plant of Commercial Solvents.

In the field of biologicals we have W. W. Ferguson, Purdue 1929 and M.S. 1931, with the Michigan State Board of Health; G. H. Echelbarger, Purdue 1936 and M.S. 1938 with Pitman Moore and Company; J. O. MacFarlane, Purdue 1940 and M.S. 1942, with Squibb and Company; M. C. Creditor, Purdue 1940, with Lederle Laboratories Inc. A. E. Boly, M.S. Lehigh 1938, worked towards his Ph.D. degree until 1941 and then went to Pitman Moore and Company and then to National Drug Company. E. Voigt, the second assistant in the Department of Bacteriology at Purdue, was a Purdue graduate in 1915. He went to Lederle Laboratories Inc. after two years of graduate work and is head of production.

H. C. Travelbee, M.S. Purdue 1916, C. D. Goodale, M.S. 1924, Don Cook, M.S. 1935 and N. R. Tarvin, M.S. 1932, all Purdue graduates, have gone into the business field as salesmen.

R. K. Jennings and R. L. Phillips, B.S. 1933 and M.S. 1935, are located at the Franklin Institute for Cancer Research.

George Kensler, B.S. 1928, left Lederle Laboratories Inc. to get an advanced degree at Purdue. He was granted the Ph.D. degree in 1938 and went to Kraft Cheese Company, where he is chief bacteriologist.

There are two men who were on the Purdue staff but who had to leave because of the war situation. G. D. Canatsay graduated from Purdue in 1937 and obtained his M.S. in 1939. He was an instructor when he left in 1942 to join the Sanitary Corps. Dean R. Bahler, B.S. 1939 and M.S. 1941, left in 1942 before completing his work. He is an ensign in the U. S. Navy.

Within recent years work along the lines of clinical diagnosis has been developed at Purdue. Dr. L. J. Arbogast, until his induction into the Army Medical Corps and Miss Marie Martin, B.S. Purdue 1931 and M.S. 1934, both from the Home Hospital in Lafayette, carry on the work in this field.

There have been several who have obtained their undergraduate training at Purdue and who have gone on in the field of bacteriology. We like to believe that their inspiration was gathered here. I have in mind such men as C. H. Werkman of Iowa State College. He graduated from Purdue in 1919 and is now one of the leading international figures in the fermentation field.

From a very small beginning of one instructor teaching one-half semester of bacteriology in 1893 there are now on the Purdue University campus two full professors, one associate professor, one assistant professor, one instructor and five assistants, all teaching bacteriology. In addition to this there is one associate in the Agricultural Experiment Station who devotes all of his time to research in Bacteriology.