

“INAUGURATING A SCIENTIFIC ERA”

**THE PATHOLOGICAL DEPARTMENT
CENTRAL INDIANA HOSPITAL FOR THE INSANE
(1896-1996)**

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“Physicians who have studied in the pathological laboratories of the old world [Europe] say that they have seen nothing to surpass it.”

--Indianapolis Sentinel
December 19, 1896

“[The Indiana Medical History Museum] is quite simply without peer in the entire country. What sets it apart from the competition is not its collection . . . but rather the incredibly well-preserved building in which the collection is displayed.”

--Martin R. Lipp, M.D.
Medical Landmarks U.S.A.
A Travel Guide (1991)

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THE PATHOLOGICAL DEPARTMENT CENTRAL INDIANA HOSPITAL FOR THE INSANE (1896-1996)

In December 1896, Indiana's medical community received a state-of-the-art resource for the study of mental illness and for medical education when the Pathological Department at the Central Indiana Hospital for the Insane was formally dedicated.

In the past century, the facility has served countless medical students and professionals who were working to better understand mental illness and hoping to find new cures. Today, the Indiana Medical History Museum preserves this unique historic structure in order to educate students of all ages not only about the complex issues involved in the treatment of mental illness but also about the vital role Indiana has played in the history of the healing arts.

THE ADVENT OF MODERN, SCIENTIFIC MEDICINE

By the 1880s and 1890s, medicine nationwide was undergoing a transformation. The germ theory, put forth in the 1860s, had greatly influenced the practice of medicine and a number of diseases had been linked with the particular bacteria causing them. Tests also had been developed for examining blood, urine and other fluids and tissues to determine the presence of disease. In addition, there was a new trend in the 1880s and 1890s towards equipping hospitals with laboratories for chemical, microscopical and bacteriological studies of illness.

With the advent of the germ theory and other scientific discoveries, the medical profession urged mental hospitals to build laboratory facilities in which to study the causes of mental illness and, hopefully, to find cures for this disease. As part of this trend, the Central Indiana Hospital for the Insane devised its Pathological Department.

Yet, it was not until the 1910s that such laboratory facilities became more common. In the late nineteenth century, very few hospitals set aside space or money for elaborate laboratory facilities. Most hospital pathology laboratories were housed in one or two poorly equipped rooms in the wings of administration or ward buildings.

THE CREATION OF THE PATHOLOGICAL DEPARTMENT

In November 1848, the Indiana Hospital for the Insane (called the Central Indiana Hospital for the Insane after 1889 and then called Central State Hospital after 1926) opened with five patients and a single building. By 1896, physicians cared for nearly 1,500 patients.

Before the Indiana Hospital for the Insane constructed its Pathological Department, only one other mental hospital in the nation--Bellevue Hospital in New York City--had devoted a separate building to its laboratories. This facility had been built in 1884 through the generosity of philanthropist Andrew Carnegie.

The Indiana Hospital for the Insane first hired a pathologist in 1885. Dr. Edward F. Hodges worked as a non-resident consulting pathologist, but only remained on staff for a year. The position of pathologist then was vacant until 1890 when Dr. Frank A. Morrison joined the staff as the resident pathologist. Morrison continued in the position until 1897. When Hodges and Morrison came to the Indiana Hospital for the Insane, there was no elaborate laboratory facility for pathologists. Probably, one or two rooms in one of the hospital's

wards or administration buildings constituted the laboratories.

On becoming the superintendent of the Central Indiana Hospital for the Insane in 1894, Dr. George F. Edenharter became determined to modernize the hospital. His biggest dream for the Central Indiana Hospital for the Insane was that the hospital would devote a building to laboratory sciences and medical education.

Edenharter's original conception of his Pathological Department was a four-room, one-story structure. However, the plan that finally was implemented was much grander: the two-story, nineteen-room edifice that still stands today.

Edenharter was aided in the execution of his plan for a research facility by architect Adolph Scherrer, a local professional responsible for designing the Indiana State House and many buildings at the Central Indiana Hospital for the Insane. Those buildings included the Department for Women, which area residents nicknamed "Seven Steeples" because only seven of the structure's eight steeples were visible from the streets adjacent to the hospital's property.

Edenharter accomplished his goal without any special state appropriation. Actually, he accomplished his project at a time when funding for the hospital was declining. Through careful fiscal planning, he was able to use money from the 1895-1896 operating and maintenance funds to build the research facility. Afterwards, Edenharter struggled with the legislature over maintenance funds for years.

In 1895, the John A. Shumacher Company began construction on the building. The total cost reported by the Report of the Committee on Benevolent Institutions in the 1897 session of the Indiana House of Representatives was \$15,000. For that amount, the state received a state-of-the-art facility with four laboratories. These features included a bacteriology laboratory for conducting research and studying germ cultures, a clinical chemistry laboratory for testing blood and other fluids, an histology laboratory with microscopes for examining tissues and a photography laboratory. The building also had a library of more than 500 volumes, electric lights, a telephone connecting the building to the city and hot- and cold-running water.

"A SCIENTIFIC ERA" BEGINS

On December 18, 1896, the building was ready for unveiling. One hundred and fifty Marion County Medical Society members and guests gathered at 7:30 p.m. for the formal dedication of the Pathological Department of the Central Indiana Hospital for the Insane.

Numerous speeches were given in honor of the occasion. The guest speaker was Dr. Ludvig Hektoen, a professor of pathology at Rush Medical College in Chicago. Hektoen praised the Central Indiana Hospital for the Insane for opening such a laboratory and spoke on the history of the pathological study of the nervous system.

Later in the evening, the Marion County Medical Society presented Edenharter with a new Bausch and Lomb microscope in recognition of his efforts to provide Indiana with this marvelous resource. The crowd then retired to the hospital's chapel for coffee and cigars.

THE STAFF OF THE PATHOLOGICAL DEPARTMENT

From the start, it was the pathologist who oversaw the daily operations of the Pathological Department. The doctors responsible for patient care, known as assistant physicians, helped the pathologist with his work. Until 1924, the hospital had difficulty retaining pathologists to run the Pathological Department.

Central Indiana Hospital for the Insane Head Pathologists

| | |
|------------------------------------|-----------------------------|
| 1890-1897 | Frank A. Morrison, M.D. |
| 1897-October 31, 1898 | Robert Hessler, M.D. |
| July 1, 1899-March 31, 1900 | J. D. Healy, M.D. |
| July 1, 1900-September 31, 1900 | John B. Briggs, M.D. |
| December 1, 1900-1902 | William Charles White, M.D. |
| January 3, 1903-September 1, 1903 | A. R. Lemke, M.D. |
| September 1, 1903-October 31, 1906 | Charles F. Neu, M.D. |
| July 13, 1907-July 20, 1908 | Charles C. Manger, M.D. |
| August 17, 1908-July 14, 1910 | James Allen Jackson, M.D. |
| 1912-July 28, 1918 | Frederick C. Potter, M.D. |
| 1918-1924 | Position Vacant |
| March 19, 1924-1967 | Walter L. Bruetsch, M.D. |

By the 1880s, mental hospitals nationwide had begun to include female physicians on their staffs to care for the female patients. The Indiana Hospital for the Insane joined this trend in 1884 when the superintendent, Dr. William B. Fletcher, hired Dr. Sarah Stockton to work in the Department for Women. In 1889, Stockton left the Central Indiana Hospital for the Insane and, within two years, was replaced by another woman physician, Dr. Mary Hadley Smith. In 1898, Smith left and Stockton resumed as an assistant physician at the hospital, remaining until 1923.

In 1906, Dr. Ernest D. Martin joined the Pathological Department's staff as the assistant pathologist. Martin retained this position, even when the facility lacked a head pathologist, until his resignation on April 31, 1932. Other assistants, often volunteer, helped in the Pathological Department occasionally. From 1913 to 1917, Mrs. Frederick C. Potter, the wife of the head pathologist, wrote out autopsy reports, compiled statistics and did secretarial work for the department.

THE WORKINGS OF THE PATHOLOGICAL DEPARTMENT

During the early years of the Pathological Department, most of the pathologist's work was to run routine tests for the assistant physicians. Among these procedures were tests of the patients' blood, urine, spinal fluid and tissues. Food samples were sometimes examined too. If the pathologist was particularly busy or if the hospital lacked a pathologist at the time, the assistant physicians did their own laboratory work.

Autopsies were another frequent activity in the Pathological Department. These procedures always involved both the pathologist and the assistant physician who had cared for the patient before his or her death. The family had to consent to the autopsy being performed. After the physicians completed the autopsy, they examined the organs and tissues and prepared gross specimens for display in the anatomical museum.

Work in the Pathological Department was slow for the first decade of the twentieth century. Staff turnover was high and few families allowed autopsies to be performed on their deceased relatives. Extensive research on the causes and prevention of mental illness were minimal.

Most research done by the hospital's pathologist focused on autopsy findings, reports of which were issued

annually. Staff often focused on case studies rather than embarking upon comprehensive and lengthy experiments.

In 1898, mandatory staff training began in the Pathological Department with a review of histology, bacteriology, chemistry, pathology and microscopy. For two hours, every other day, the resident medical staff examined organs removed during autopsies and samples of blood or tissues. The pathologist then offered individual guidance.

The pathologist also led evening classes on "Clinical Anatomy", "The Finer Anatomy of the Nervous System" and "Infection", taking advantage of the building's electric lights. In 1898, *Outlines of Practical Histology: A Manual for Students*, by William Stirling, M.D., was required reading for the staff.

The Marion County Medical Society also took full advantage of the opportunities provided by the Pathological Department. At least once a year, the society conducted a meeting in the building's amphitheater, bringing in distinguished speakers from Baltimore, Chicago and Cincinnati. The pathologist and assistant physicians also occasionally presented anatomical specimens, specific cases or their current research to the society.

THE TRANSFORMATION OF MEDICAL EDUCATION

In the mid-nineteenth century, formal medical education was limited. Most physicians used bleeding to treat numerous diseases, including insanity. By removing excess blood, physicians believed they could restore the balance that supposedly occurred between the body's four humors--black bile, blood, yellow bile and phlegm--and, therefore, restore a person's health.

The medical schools available were operated by unsalaried faculty who benefitted financially from admitting large numbers of students. Admission standards were lax. A student attended two identical series of lectures, each sixteen weeks long. The pupil then would practice under an established physician for three years before beginning his own practice.

Women interested in pursuing a career in medicine had some limited opportunities by the 1850s. In 1849, at the Geneva Medical College in New York, Elizabeth Blackwell became the first woman to graduate from an American medical college. In 1850, the Women's Medical College of Pennsylvania (in Philadelphia), the first regular medical college established specifically for women, opened its doors. In 1882, before coming to the Indiana Hospital for the Insane, Sarah Stockton was graduated from this school. It was not until the end of the nineteenth century that more of the country's medical colleges routinely began to admit women with men.

Between the Civil War and the turn of the century, medical education underwent dramatic changes. Colleges set higher academic requirements for entering students, curriculum was expanded from two identical four-month terms to a three- to four-year graded curriculum. The subjects studied also were broadened from courses that focused only on anatomy to courses on bacteriology, pathology, chemistry, medicine and surgery. Also, specialties such as obstetrics, dermatology and psychiatry were taught. Lectures lost dominance as the method of teaching medicine as schools began to include extensive laboratory and clinical experiences as well.

Indiana was no exception to the changes in medical education that were occurring by the end of the nineteenth century. When the Pathological Department opened, Indiana students could attend the Medical College of Indiana (in Indianapolis), the Central College of Physicians and Surgeons (in Indianapolis), the Fort Wayne College of Medicine or one of the several sectarian schools in the state.

Between 1903 and 1908, the medical schools in Indiana changed completely. In 1903, Indiana University founded its own medical school in Bloomington. Two years later, the first of several consolidations was completed when the Medical College of Indiana, the Central College of Physicians and Surgeons and the Fort Wayne College of Medicine joined to become the Indiana Medical College, a department of Purdue

University.

In 1908, medical education in Indiana was again transformed. The Indiana Medical College united with the Indiana University School of Medicine, emerging as the Indiana University School of Medicine and Indiana's only medical school. Campuses were maintained in Bloomington and in Indianapolis. Students could spend their first two years in either Bloomington or Indianapolis. They then finished their degrees in Indianapolis. By 1912, only the first year of the program was offered in Bloomington.

In 1910, the Carnegie Foundation for the Advancement of Teaching hired Abraham Flexner to report on the status of medical education in the United States. Flexner surveyed the country's medical colleges, rating them according to their facilities, equipment, entrance requirements, faculty and research activities.

Flexner included Indiana University among those schools with higher rankings, noting that:

"The situation in the state is, thanks to the intelligent attitude of the university, distinctly hopeful, though it will take time to work it out fully. . . . That done, Indiana will be one of the few states that have successfully solved the problem of medical education."

Flexner defined the ideal medical school as one with modern and well-equipped laboratories, hospital wards run by the schools for clinical experience, adequate financial and property resources, strenuous entrance requirements, an appropriate curriculum that related to the preceding educational steps, and the desire and the facilities to conduct original research. Flexner cited the medical department of Johns Hopkins University in Baltimore, Maryland, as the paragon of medical education.

About the time the Pathological Department opened, admission requirements were becoming more rigid. In 1896, students were required to have been graduated from high school in order to attend medical school. By 1910, students who entered the Indiana University School of Medicine had to have completed two years of college. At Indiana University, students had to take two years of pre-medical courses, followed by four years of medical school, to receive a B.A. in medicine and an M.D.

Between 1903 and 1908, the first two years of course work at the Indiana University School of Medicine included physiological chemistry, embryology, human dissection, histology, bacteriology and pathology. These subjects were heavily dominated by laboratory experience.

The last two years of the Indiana University School of Medicine degree program included instruction in surgery, diagnosis, gynecology, psychology and mental diseases and other specialties. As the laboratory work lessened, students instead received more experience on the wards of area hospitals. Students attended clinics at Indianapolis City Hospital (now Wishard Memorial Hospital), St. Vincent's Hospital, Bobb's Free Dispensary and Long Hospital. These facilities were located in Indianapolis, Indiana.

MEDICAL EDUCATION AND THE PATHOLOGICAL DEPARTMENT

Beginning in 1900, the Pathological Department at the Central Indiana Hospital for the Insane was an integral part of the four-year medical curriculum. In 1900, the Medical College of Indiana and the Central College of Physicians and Surgeons began bringing their pupils to the Pathological Department. Pupils came once a week in their junior or senior years and heard lectures on mental and nervous diseases.

In 1905, the students of the newly formed Indiana Medical College continued to come to the Pathological Department for classes as they had before the merger. In 1906, they were joined by students from Indiana University's fledgling medical school. In 1908, after the next merger, seniors at the Indiana University School of Medicine began attending courses in neuropathology and mental and nervous diseases at the Pathological Department.

Beginning in 1906, Indiana University required its psychology classes to attend lectures at the Pathological Department. Indiana University professor Ernest H. Lindley conducted the sessions, lecturing on mental pathology. DePauw University soon followed Indiana University's example. In addition to medical students, local physicians, lawyers, ministers and social workers were encouraged to sit in on the lectures to advance or refresh their own understanding of mental illness.

Besides the medical college professors, the current pathologist on staff at the Central Indiana Hospital for the Insane taught courses at the Pathological Department. Very often, the pathologist and other members of the hospital's staff were members of the faculty at one of the local medical colleges.

Class sessions lasted two to three hours and began with fifteen to twenty minutes of quizzing before the lecture began. In addition to an hour or two of lecture, there was an hour of demonstration when patients suffering from various mental illnesses were brought into the class. Lecture topics ranged from sessions on the anatomy of the brain to discussions of the types and the causes of mental illness.

Students were required to be quiet on the grounds of the hospital. With gas lines running into the building and chemicals stored in many of the laboratories, smoking also was forbidden. If autopsies were scheduled, the pathologist contacted the medical colleges in order for students to attend. The pathologist had the power to draw up exams, but the exams were taken at the medical schools' campuses, not at the Pathological Department.

LABORATORIES, LECTURES AND LESIONS

In the mid-1920s, the Central Indiana Hospital for the Insane underwent a transition which brought the facility into an era of progressive research and national leadership.

In December 1923, longtime superintendent Dr. George F. Edenharter passed away, leaving the Central Indiana Hospital for the Insane and the Pathological Department in need of new leadership. Dr. Max A. Bahr, a physician who had long been involved in the work of the hospital, became the next superintendent.

When Bahr began his term as superintendent, the position of pathologist had been vacant since 1918. However, in 1924, he met a young German doctor--Dr. Walter Ludwig Bruetsch--who was visiting friends in Indianapolis. Bahr persuaded Bruetsch to consider the job of pathologist at the hospital and, on March 19, 1924, Bruetsch became the next pathologist at the Central Indiana Hospital for the Insane.

Throughout these staff transitions at the Central Indiana Hospital for the Insane, students from the Indiana University School of Medicine continued to come to the Pathological Department for classes during Bahr's administration, even during World War II.

Medical education continued to change during the early twentieth century, partially due to Flexner's report on the status of medical education in the United States. Proprietary schools had vanished, replaced by schools with strong financial resources and salaried instructors. In the 1910s and 1920s, medical schools across the country gave more emphasis to medical research and expanded hospital facilities for clinical instruction. Internships became an integral and accepted part of medical education as well. Nationwide, admission and graduation requirements were more standardized because state licensing laws had been established.

During World War II, medical education changed to meet the war demands. With an accelerated program, Indiana University began graduating two classes of physicians each year. Students could complete the four-year program within three years because students could take three terms (instead of two terms) in each year. Summer vacation was eliminated. This practice was discontinued at the end of the war.

The juniors and seniors from the Indiana University School of Medicine coming to the Pathological Department between the 1920s and the 1950s shared rides in each other's cars or took the streetcar to the Central Indiana Hospital for the Insane. A two- to three-hour class session on neurology and psychiatry was conducted each Saturday. Classes were led by Bahr and Bruetsch, with occasional help from Indiana University neurology and psychiatry professors Dr. Larue Carter and Dr. Albert Sterne.

Bruetsch, who was responsible for most of the lectures, is remembered by many students as having a thick, and difficult-to-understand, German accent. A 1943 graduate recalls Bruetsch's pronunciation of "this brain" as "zis bwain". The Indiana University School of Medicine Class of May 1942 overcame this difficulty by buying transcripts of Bruetsch's lectures from a fellow student's wife. Able to understand Bruetsch better than most people, she would attend the classes, take notes and sell copies for a quarter each.

Bruetsch also is remembered as an energetic and animated lecturer. Dr. Hugh K. Thatcher (Indiana University School of Medicine Class of 1934) remembers that Bruetsch "almost got up on top of that table and walked on it, he was so excited teaching this stuff. . . . [H]e'd prance back and forth across there, whereas Dr. Bahr would stand and lecture to you."

The first hour of classes in the Pathological Department was devoted to lecture, with the second half of the class being used to examine patients from the wards as examples of the way different illnesses affected people. Bahr and Bruetsch also used slides and gross specimens to keep the attention of their students and to convey their points. They did not take the students into the laboratories as part of the course work.

The building and its resources--ranging from microscopic slides to photographs and brain specimens--were used not only by medical students. From the 1940s to the 1960s, medical residents preparing for examinations given by the American Board of Psychiatry and Neurology used the slides and specimens for study.

Social workers and ministers continued to attend special lectures in the building. In the 1920s, lawyers and law students from the Indiana University and the Benjamin Harrison law schools attended courses on mental jurisprudence. The Benjamin Harrison Law School opened in Indianapolis in 1914 and, eventually, became part of the Indiana University School of Law in the 1940s. Today, the law school is located on the campus of Indiana University-Purdue University at Indianapolis (IUPUI).

In addition, psychology students from Indiana University, Butler University, DePauw University and Purdue University came to the Pathological Department annually until the 1950s. In the late 1930s, there were even classes from Miami University in Ohio and from several teachers' colleges in attendance.

The medical staff continued to receive training in the department as well. By the 1930s, new staff members were attending the lectures given to medical students in the Pathological Department instead of attending independent staff seminars.

THE EXPANDED STAFF OF THE PATHOLOGICAL DEPARTMENT

Under the command of Bahr and Bruetsch, the research functions of the Pathological Department blossomed. An extended staff supported this growth.

The hospital's assistant physicians continued to help with autopsies and, occasionally, laboratory work in the building. Several other employees assisted as well. Truitt Brown started as a laboratory technician in 1925 and his wife, Vanna Brown, began assisting soon after. Carrie MacDonald joined the department in 1948 providing additional laboratory assistance as well as secretarial support for Bruetsch.

Slightly more unusual, in the 1920s and 1930s, Bruetsch and Bahr tried using two patients as laboratory assistants. One was given clerical work to perform and the other worked in the anatomical museum.

“TO GAIN A KEENER INSIGHT”: THE MALARIA TREATMENT OF SYPHILIS

The most significant area of research at Central State Hospital during Bahr's and Bruetsch's tenures was in the treatment of syphilis.

A sexually transmitted disease, syphilis progresses through three stages. The disease causes sores, followed by a period of remission after which the disease can attack the heart and the central nervous system, causing dementia or general paresis. General paresis results in the loss of power and mental abilities,

eventually leading to death. In 1930, 30 percent of admissions at Central State Hospital suffered from general paresis due to syphilis.

The most prevalent treatments for syphilis in the early twentieth century were ointments and compounds containing mercury or arsenic. Neither agent proved very effective against the disease. In 1905, the scientists isolated the bacterium that caused syphilis, but this discovery did not lead to any new cures. In 1909, German physician Paul Ehrlich came up with "606" or Salvarsen, which was widely hailed as the best hope for syphilis. Yet, even Salvarsen was an arsenic-based compound and required repeated injections before stopping syphilis.

In 1917, Austrian psychiatrist Julius Von Juaregg stumbled upon a different solution. He discovered that syphilitic patients could be treated by injecting them with malaria. The resulting fever would kill off the syphilitic cells and, then, quinine could be given to cure the malaria. In 1927, Von Juaregg received a Nobel Prize for this work.

In the United States, Dr. Watson W. Eldridge and a committee at St. Elizabeth's Hospital in Washington D.C. were the first to try this new treatment. In 1923, they inoculated sixty-eight parietic patients and were cautiously optimistic about the results. The experiment, however, was short term.

By 1925, several other hospitals around the country had tried the therapy and the current medical literature was filled with the details. In the mid-1920s, the New York Psychiatric Institute, the Mayo Clinic, the Cleveland State Hospital and the state hospital at Harrisburg, Pennsylvania, had published reports. The Central Indiana Hospital for the Insane did not wait long to experiment with this treatment.

The first Central Indiana Hospital for the Insane patient to receive the malaria treatment was injected with the disease on August 14, 1925. After an incubation period, the malaria was treated with quinine. Doses ranging from three to ten grains of quinine were administered three times a day for the first few days. The patient then spent several days without quinine before being given another week of the quinine doses. The results procured at the hospital hovered between a 20 percent to 30 percent discharge rate.

In 1940, a new quartan strain--which causes seizures and fever every four days rather than every third day (like the standard tertian strain)--was introduced at Central State Hospital. It was used for treating African-American syphilitics as well as white patients who were unresponsive to the tertian strain.

Central State Hospital and Bruetsch gained a wide reputation for being a forerunner in the malaria treatment. Between 1930 and 1945, Bruetsch sent 1,846 samples of malarial blood to other doctors around the country who were interested in infecting syphilitics with malaria.

In 1929, Bruetsch and Bahr created an exhibit entitled "Neurosyphilis and the Malaria Treatment of General Paresis." The two traveled internationally with the display, sharing their findings at conferences. In 1931, when Bruetsch presented the exhibit at one such conference in Breslau, Germany, Von Juaregg was in attendance.

In 1937, the United States Public Health Service and the Cooperative Clinical Group selected Central State Hospital as one of six hospitals in the nation to study the effects of malaria therapy and artificial fever (such as that produced with a heat lamp) and determine the effectiveness of the two treatments in treating general paresis. The results apparently did not warrant continuation. By 1939, the combination therapy had been abandoned. However, Bruetsch remained a consultant with the Public Health Service until the 1950s.

In addition, the National Committee for Mental Hygiene surveyed the country's mental hospitals in 1938. They included Central State Hospital in their list of the top twenty research facilities nationwide.

Bruetsch also studied syphilitic optic atrophy, a degenerative condition of the eye caused by syphilis. Bruetsch, with the help of Dr. C. P. Clark, head of the hospital's eye department, studied the "visual pathways" of syphilitics for fifteen years. They determined that malaria treatment worked as well, or better, than surgery.

“TO GAIN A KEENER INSIGHT”: SPINAL FLUID RESEARCH

Bruetsch and the staff in the Pathological Department examined a number of other research questions as well. The Pathological Department maintained a study of spinal fluid between 1931 and 1941. Bruetsch, Bahr and some of the assistant physicians systematically tested nearly 3,000 patients as they were admitted. In 1941, they concluded that protein counts in spinal fluid tests varied from illness to illness and could provide useful diagnostic information.

One of the tests used to examine spinal fluid was the colloidal gold test. Varying amounts of sodium chloride solution and spinal fluid are combined in eleven test tubes. Colloidal gold reagent then is added to all test tubes. Within twenty-four hours, the samples change color. The sequence of the colors in the eleven tubes indicates whether a patient is suffering from one of the stages of syphilis or from other diseases like meningitis.

“TO GAIN A KEENER INSIGHT”: RHEUMATIC BRAIN DISEASE

Bruetsch also began to study systematically rheumatic diseases in the brain. After a streptococcal infection, the antibodies produced to fight the infection sometimes attack the body's tissues. This attack is known as rheumatic fever. The result is damage to the heart and kidneys, as indicated by lesions and inflammation of the arteries. After observing instances of this damage for fifteen years, Bruetsch began arguing that rheumatic fever could damage the brain as well as the heart and kidneys.

Related to rheumatic fever was a phenomenon that Bruetsch called rheumatic epilepsy. Bruetsch noted that very often patients with rheumatic brain disease suffered seizures and argued that these seizures were the result of the rheumatic lesions. In 1941, Bruetsch received an award from the Layman's League against Epilepsy for his research.

In addition, the National Committee for Mental Hygiene in November 1936 asked Central State Hospital to participate in a study of dementia praecox, the term once used to denote schizophrenia. The project used post-mortem study to discover how often patients suffering from dementia praecox had rheumatic brain lesions.

During World War II, the research function of the Pathological Department lessened in response to staff shortages and war demands. In 1942, a war-time project was begun with Eli Lilly and Company. Java, the supplier of about 90 percent of the world's anti-malaria drugs, was under Japanese control from March 1942 until the end of the war. Since the drugs could not be obtained from occupied Java, Central State Hospital and Bruetsch began working with Lilly to test anti-malaria drugs. However, this work was short-lived because of home-front constraints.

Also, the study of rheumatic diseases continued throughout the war whenever possible. In 1944, Bahr reported that this study was one of the most important research developments in recent years. He heralded rheumatic brain disease as a newly discovered cause of mental illness, which could lead to new understandings and new cures.

Although today rheumatic brain disease no longer carries any validity in the medical community as a cause of mental illness, Bahr in 1951 was proud that "the diagnosis originated at Central State Hospital of Indianapolis and has now been generally accepted."

“A SCIENTIFIC ERA” ENDS

By the mid-1950s, the Pathological Department's scientific era was coming to an end and the Pathological

Department was faced with dramatic changes.

In 1945, Central State Hospital helped eliminate the malaria treatment of syphilis that the hospital had helped to perfect. In that year, the Pathological Department joined the National Research Council and eight other hospitals around the country in a study of the effectiveness of penicillin in treating syphilis. By 1949, its advantages over malaria therapy were unmistakable. In 1951, the hospital's reports stressed the greater efficiency of penicillin and reported that they now treated syphilis with 15 million units of penicillin rather than with a course of malaria. In the twenty-six years that malaria treatment had been used at Central State Hospital, 1,250 patients suffering from general paresis had received malaria therapy and 2,163 samples of malarial blood had been mailed to physicians around the country for use in the treatment of syphilis.

In March 1952, Bahr retired at age seventy-seven. Dr. Clifford Williams assumed control of Central State Hospital as the next superintendent. Although Williams remained involved in the research function of the hospital and the Pathological Department, he was never as actively involved as Bahr had been.

In 1956, medical students from Indiana University ceased coming to the Pathological Department for their neurology training, going instead to the Larue R. Carter Memorial Hospital. Several factors made this move logical. For several years, a push had occurred towards medical schools hiring full-time neurologists or psychiatrists, something that the Pathological Department could not offer. In addition, Bruetsch, suffering from tuberculosis, took a leave of absence from 1955-1957 from both his research and his teaching duties.

In the 1950s and 1960s, Bruetsch continued his research on rheumatic diseases. He also began studying a related condition: cerebral arteriosclerosis or the hardening of the arteries of the brain. Bruetsch believed that this condition was one of the main causes of mental illness in the elderly. Several years later, Bruetsch did a brief study comparing the hearts of patients suffering from rheumatic endarteritis (inflammation of arteries due to rheumatic disease) and those patients suffering from inflammation of arteries due to lupus, an ulcerating skin disease without a known cause. By 1961, Bruetsch had begun comparing arteriosclerotic changes in the brain to those changes in the kidneys, and tried to draw connections to his conclusions on rheumatic diseases. These studies continued until his retirement in 1967.

By the late 1960s, Bruetsch was the only physician still working in the Pathological Department on a regular basis. Other than for his own research, the laboratories were no longer used. Bruetsch had ceased conducting autopsy work. Instead, medical residents from Methodist Hospital rotated through to do autopsies. Any tissue samples to be examined were studied at the laboratories at Methodist Hospital.

THE INDIANA MEDICAL HISTORY MUSEUM

In 1969, a coalition of local physicians and citizens, including Dr. Charles Bonsett, Dr. John U. Keating, Dr. Dwight W. Schuster, Dr. William M. Sholty and Mrs. Donald J. White, took steps to preserve the building, establishing the private, non-profit organization that became the Indiana Medical History Museum.

The building, still state property, continued to be used for medical research. Dr. Bonsett operated an electroencephalographic laboratory in the building and the Indiana Neuromuscular Research Laboratory used the space as well. These activities continued until 1988.

In 1971, a behest from Indianapolis neurologist E. Vernon Hahn made possible the restoration of the building's amphitheater. On October 10, 1971, the Pathological Department was rededicated as the Indiana Medical History Museum to serve as a monument to Indiana's medical heritage. Soon after, the building was added to the National Register of Historic Places and to the Historic American Buildings Survey.

In 1986, the legislature for the State of Indiana provided the museum with a 99-year lease for the Pathological Department (often called the Old Pathology Building) and the surrounding five acres. As a result, the Indiana Medical History Museum today remains open to the public although the State of Indiana closed Central State Hospital in June 1994.

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