

# MCB and the Age of Biology

Doug Peterson

## A New School Emerges With a New Millennium

The nineteenth century has been called “the Age of Engineering” and the twentieth “the Age of Chemistry and Physics.” But what does that make this century? The late Charles Miller, MCB’s first director, saw the twenty-first century as the emerging **Age of Biology**. So it was only fitting that the new School of Molecular and Cellular Biology would have its genesis in the year 2000, just as we crossed the threshold into the new century and new millennium.

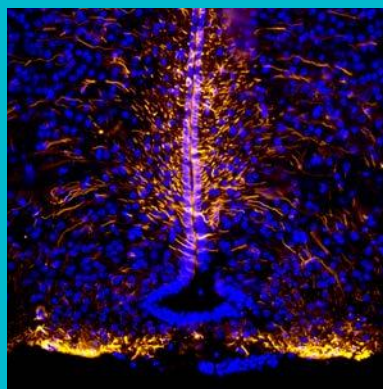
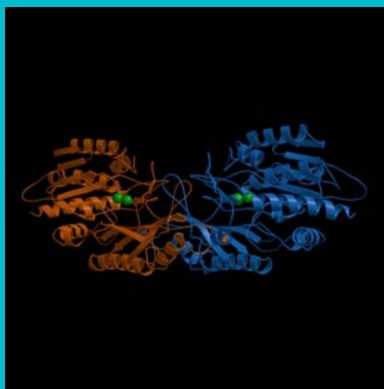
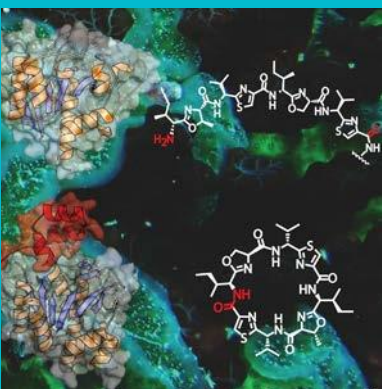
According to Charles Miller (see *MCB* issue 1), “The reorganization plan for MCB was fundamentally based on the idea that the dramatic progress in the biological sciences had not just blurred the lines between the disciplines represented by our four departments, but in a significant way had caused these disciplinary lines to disappear. Many faculty members in each of our departments could have fit comfortably in one or more of the other departments. But overall, all four departments shared a common scientific culture with more similarities than differences. We also realized that our undergraduate students required a more focused and progressive curriculum. We hoped to provide them with a broad background that would prepare them not only for graduate and professional schools but also for entry into the biotechnology, pharmaceutical, and other industries seeking workers trained in molecular and cellular biology.”

MCB was actually the culmination of changes in biology that had been building for half a century. This wave of change was triggered by the genetic revolution, beginning with the discovery of DNA’s double-helix structure in the 1950s and accelerating with the biomolecular revolution of the 1980s and 90s, explained Robert Switzer, professor emeritus of biochemistry. Since then, biology has been steadily permeating many other disciplines, particularly engineering and physics, and biotechnology is now a major research area.

“Biology was utterly transformed by molecular genetics,” Switzer says. “Before the genetic revolution, biology was more descriptive. You reported what you saw, and what you could see was anatomy and behavior.”

Biology eventually split along this molecular fault line, separating into two disciplines—systematic biology and molecular biology—says Stephen Sligar, MCB director. In general, systematic biology is about large biological systems, while molecular biology is more focused on the particulars of biomolecular machinery.

Changes began to emerge in biology departments across the country in the 1990s. In fact, says Switzer, there was a sense that Illinois was falling behind as other universities separated molecular and systematic biology. In the 1990s, the U of I had a single School of Life Sciences, but under the leadership of Larry Faulkner, dean of the College of Liberal Arts and Sciences, talks about dividing the school began. When Jesse Delia became LAS dean, the push for division became even stronger, and the process of creating two new schools officially began in 1997.



“In 1997, the School of Life Sciences began to function as two separate units,” recalls Ann Zielinski, MCB’s associate director for administration and business affairs. Zielinski was there from the very beginning, moving into the new MCB administrative offices along with Miller, administrative aide Christine Smith (retired), and only one student employee. It would take until the year 2000 for the two new schools to jump through all of the necessary hoops: approval by the units involved, LAS, the Office of the Provost, the U of I Board of Trustees, and ultimately the Illinois Board of Education.

Separating into two schools was like separating conjoined twins, for disconnecting them was complicated and often controversial. Nevertheless, the separation became official in July of 2000, and the School of Life Sciences became two—the School of MCB and the School of Integrative Biology (SIB). Entomologist Fred Delcomyn would be director of SIB, while Miller would take over as MCB’s first director.

Delcomyn says the university couldn’t have made a better choice for MCB director with Miller, because the division into two schools could have been disastrous if not for his even-handedness.

“On the one hand, you had MCB, with two-thirds of the faculty and more than two-thirds of the funding, not to mention an experienced administrator at the helm in Miller,” says Delcomyn. “On the SIB side, we had one-third of the faculty, and I had no experience at the time as an administrator.”

Delcomyn and Miller met regularly to hash out the division, and Delcomyn says, “Charles recognized that the success of MCB depended on the success of SIB. You couldn’t have one unit succeed and the other unit fail.”

In other words, it was necessary to view the two new schools as a whole—like a completely integrated biological organism.

“Charles never tried to run roughshod over us,” Delcomyn adds. “He was always collegial and there was always the attitude that we were in

this together.”

But the balancing act didn’t just apply to SIB and MCB. There were also internal tensions within MCB. As Martha Gillette, professor of cell and developmental biology, points out, the various departments that would eventually make up MCB had to give up some control, particularly in undergraduate teaching.

MCB absorbed three departments from the old School of Life Sciences, and two of them changed their names, eventually resulting in the Departments of Microbiology, Cell and Developmental Biology, and Molecular and Integrative Biology. Administrators decided to bring a fourth department—Biochemistry—into the MCB fold. At the time, Biochemistry was located in an entirely different school, the School of Chemical Sciences (SCS).

It became obvious that there needed to be biochemists in the newly formed MCB, Switzer says, but administrators didn’t want there to be two biochemistry departments, one in MCB and the other still in SCS. So Biochemistry shifted to MCB.

“The chemists were not happy about our leaving at the time. It was controversial,” Switzer says. After all, chemistry has had a long and illustrious history at Illinois. When the dust settled and MCB became operative in 2000, it had four departments, none of which had interacted closely together before.

They were moving into uncharted waters.

On the undergraduate level, biology majors would no longer be balkanized into an array of majors, says James Imlay, MCB’s associate director for graduate affairs. All undergraduates would enter as biology majors and then decide between MCB and SIB by their sophomore year.

The undergraduate curriculum also underwent a complete overhaul, an effort spearheaded by Miller and Melissa Michael, assistant director for undergraduate instruction. Sligar credits them with coming up with a brilliant new system—creating an infrastructure of academic professionals who would run the education program and take responsibility for

grade management and administrative issues.

This freed top-level researchers to take on classroom teaching since they would no longer be responsible for time-consuming administrative duties.

“When Charles asked if I could teach a big class, I thought it would be too much, that it would kill my research program,” Sligar recalls. “But then he said, ‘Let me explain to you how this new system works.’ And he was right. It worked.”

“The undergraduate program dramatically improved,” Imlay says. “We were able to sharpen its focus and at the same time make it more rigorous. Because of that, our undergraduate students have done extremely well and medical school acceptance rates are quite high.”

To make all of this happen, Gillette says, “I think Charles was able to get people to work together, get past their concerns, and give up some of the things they wanted, so they could work as a group.”

The irony is that nearly 13 years past the division into MCB and SIB, the separation between the two areas—systematic biology and molecular biology—is a lot fuzzier than it once was. “Fast forward to today, and you’ll see that it’s an artificial division,” Sligar says. “Everybody is doing genomics, both MCB and SIB. So it’s no longer clear where the division lies between systematic and molecular biology.”

Still, the changes that came with the new millennium have been a boon for MCB, and the school has been “wildly successful,” says Sligar. In this Age of Biology, MCB has emerged as one of the largest majors on campus, with over 1,800 undergraduate majors and over 350 graduate students. The new arrangement has also ushered in an era of unprecedented cooperation between MCB and departments all across campus.

As Switzer puts it, “It’s in our DNA now.” ■

#### FOR FURTHER READING

Introduction by Charles Miller. *MCB I*:  
<http://mcb.illinois.edu/magazine>

# MCB

## TIMELINE

July 2, 1862: President Abraham Lincoln signs Morrill Land-Grant College Act of 1862 into law.

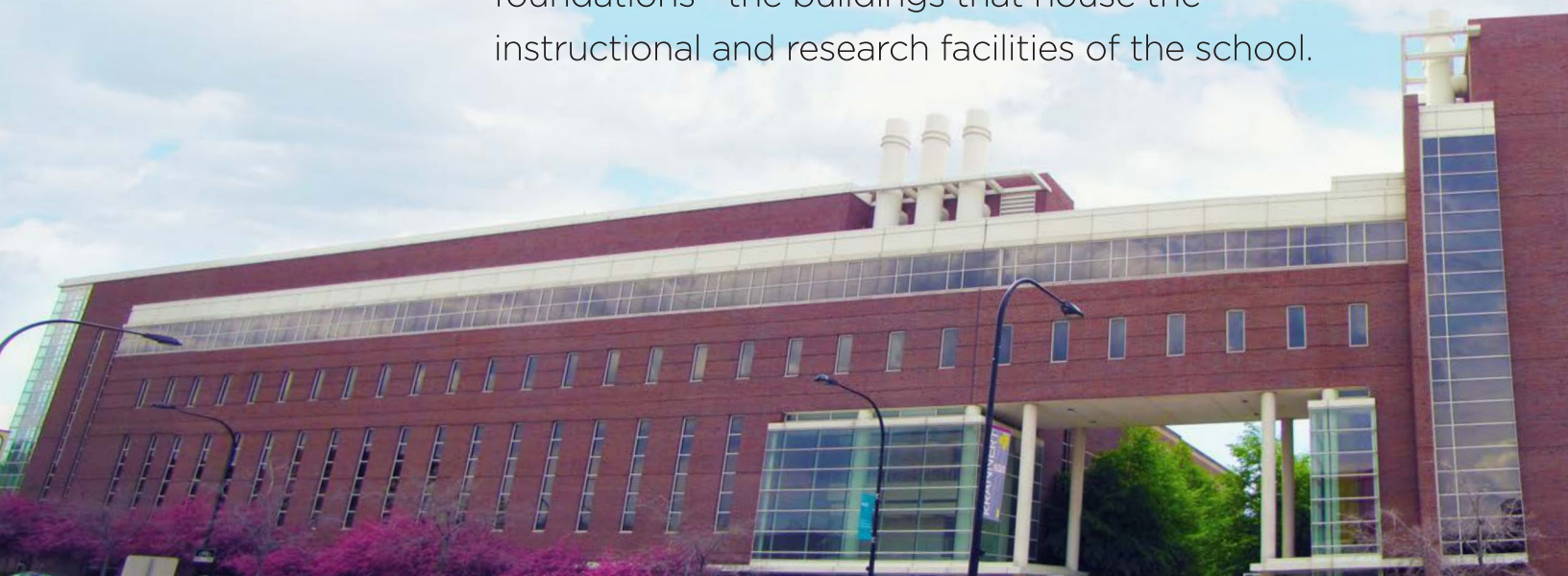
1860

March 2, 1867: Illinois Industrial University opens doors of one campus building.

# MCB

## BUILDINGS

The School of MCB provides a strong foundation for its students and faculty members to push the boundaries of current knowledge, and pioneer breakthroughs in their respective fields. As current and former members of the MCB family can attest, this academic infrastructure is fostered in part by more concrete kinds of foundations—the buildings that house the instructional and research facilities of the school.



November 8, 1868: Thomas J. Burrill becomes Assistant Professor of Natural History and Botany.

1871-1872: First classes encompassing microbiology are offered by Professor Burrill.

1884: Stephen A. Forbes named Professor of Zoology.

1870

1880

1890

March 11, 1868: University inaugurated and formally opens. Tuition is set at \$5 a term, \$15 annually. 77 students are enrolled during the first term.

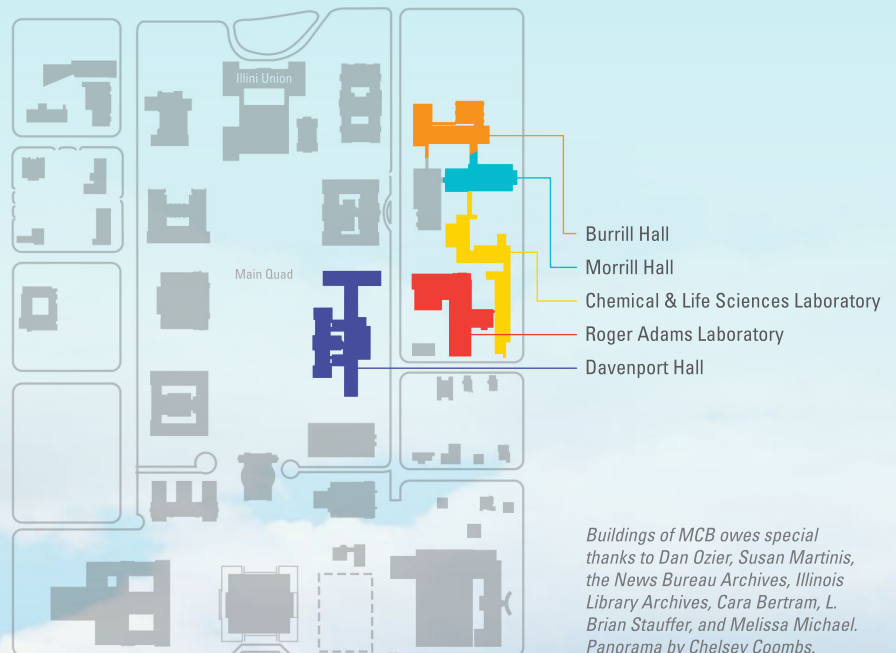
1878: The School of Natural History of the College of Natural Science begins to offer courses in Microscopy and Fungology.

1885: Illinois Industrial University renamed University of Illinois.

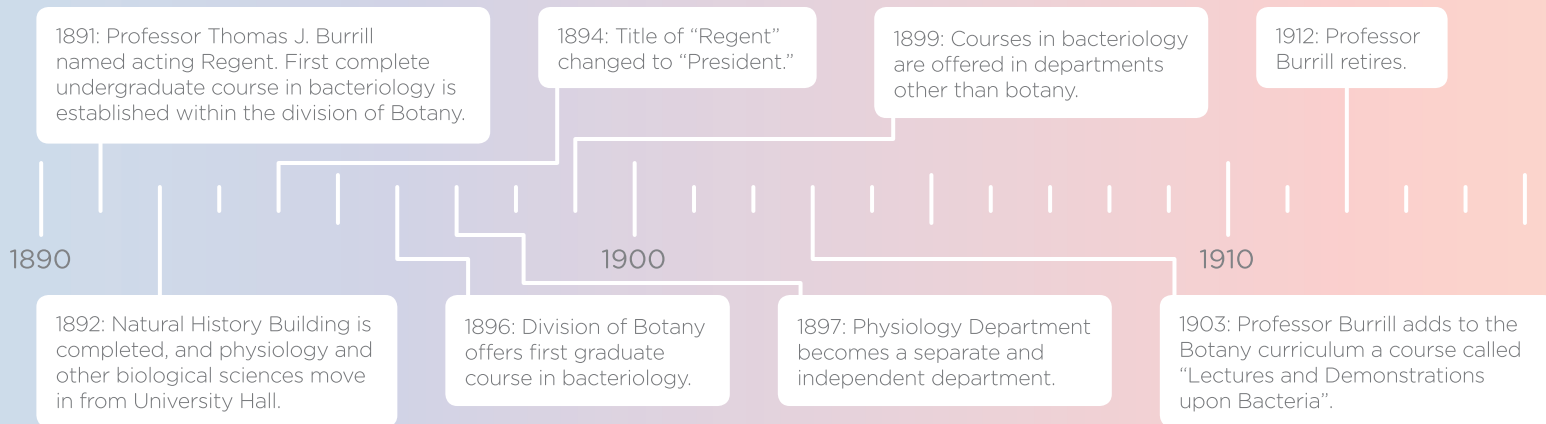
1886: General biology is added to the courses listed in botany.

There are five key buildings in the School of MCB: the Chemical and Life Sciences Laboratory, Roger Adams Laboratory, Davenport Hall, Morrill Hall and Burrill Hall. Their distinctive architectural features and instructional spaces complement their unique histories with the program.

The buildings of MCB are as diverse as its students, faculty members, and alumni. Over time these structures have been added to, renovated, and reconfigured; these changes mirror the dynamic state of the field of molecular and cellular biology itself. We continue to address the instructional and research needs of students and faculty members to maintain the standards of research and teaching excellence that are the hallmarks of MCB.



## MCB TIMELINE



## DAVENPORT HALL



Davenport Hall aerial view, 1900. Note the Observatory in the upper right.

*Courtesy of University of Illinois Archives*

The 94,900 square foot Agriculture Building originally cost the university \$122,972 to build and was dedicated on May 21, 1901. Its front entrance showcases the unique architecture of the building, which includes two terra cotta Ionic columns and two quotes inscribed in stone: "Industrial education prepares the way for a millennium of labor," and "The wealth of Illinois is in her soil and her strength lies in its intelligent development," attributed to Professor Jonathan Baldwin Turner and University President Andrew S. Draper, respectively.

A \$6000 addition was added to the building in 1917. In 1947, the building was renamed "Davenport Hall" in honor

of Eugene Davenport, a professor at the university from 1895 to 1922 who also served as the dean of the College of Agriculture and vice-president of the university during his long career. In the 1950s, the building was remodeled for \$305,000. Over the years, the building has housed the Departments of Agronomy, Animal Nutrition, and Dairy Production, the Regional Soybean Laboratory, and the US Department of Agriculture. Around 1991, the School of Life Sciences reconfigured Davenport's second floor with new laboratory and instructional space. This floor currently houses the MCB Instructional Program and hosts many introductory MCB labs.

## ROGER ADAMS LABORATORY



Roger Adams Lab, date unknown.

*Courtesy of News Bureau Archives.*

Roger Adams Laboratory (RAL), completed in 1950, was known as the "East Chemistry Building" for twenty-two years. It was renamed in honor of Adams in 1971, a year after his death. Adams was a professor affiliated with the Departments of Chemistry and Chemical Engineering whose career at the university spanned fifty-six years and whose contributions were significant to the advancement of the field of organic chemistry. The Biochemistry Department has been a part of RAL since the building's opening. The department moved from the School of Chemical Sciences to the School of MCB when MCB was created in 2000.

Over the years, an addition was added to RAL, and beginning in 2006, a project was undertaken to renovate the building's infrastructure, ventilation systems, and laboratory spaces. Central air

conditioning and new cold rooms make up some of the added features, and the floor layouts have been reconfigured into a modular scheme in which laboratory spaces are on the perimeter surrounding central office spaces. Lab spaces continue to be remodeled each year to fit the school's needs as new professors join the Department of Biochemistry. A state-of-the-art video conference room is being established in recently renovated space to honor Professor Lowell Hager's enormous service and contributions to the Department of Biochemistry and the University of Illinois. Donations will be matched by a friend of Lowell Hager's. Funds that exceed the cost of the new conference room will be used for the Lowell P. Hager Graduate Fellowship Fund. For more information: <http://mcb.illinois.edu/departments/biochemistry/giving>.

1921: Trustees approve the organization of the departments of Bacteriology, Botany, Entomology, Physiology, and Zoology into a Division of Biological Sciences.

1941: The Departments of Zoology and Physiology are combined.

1920

1930

1940

1933: Rumors spread that a new Biology Building will be built.

## BURRILL HALL



Laying the corner stone of Burrill Hall. From left to right: F.M. Clark, Bacteriology; Dean of LAS J.R. Smiley; Library Director R.B. Downs; University President David Dodds Henry (after whom the Henry Administration Building was named); Building Committee Head Norman Parker; Board of Trustees President Park Livingston; LAS representative on Building Project John D. Anderson; and Provost and Vice President Gordon Ray.

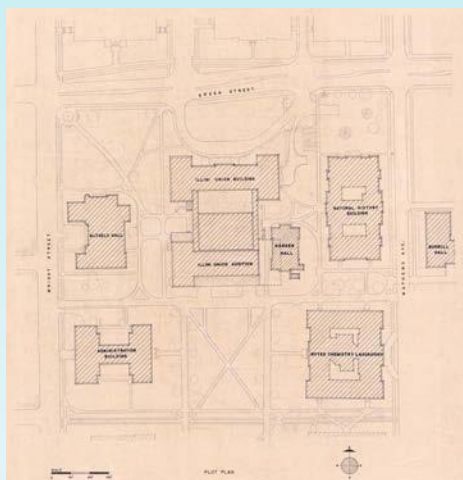
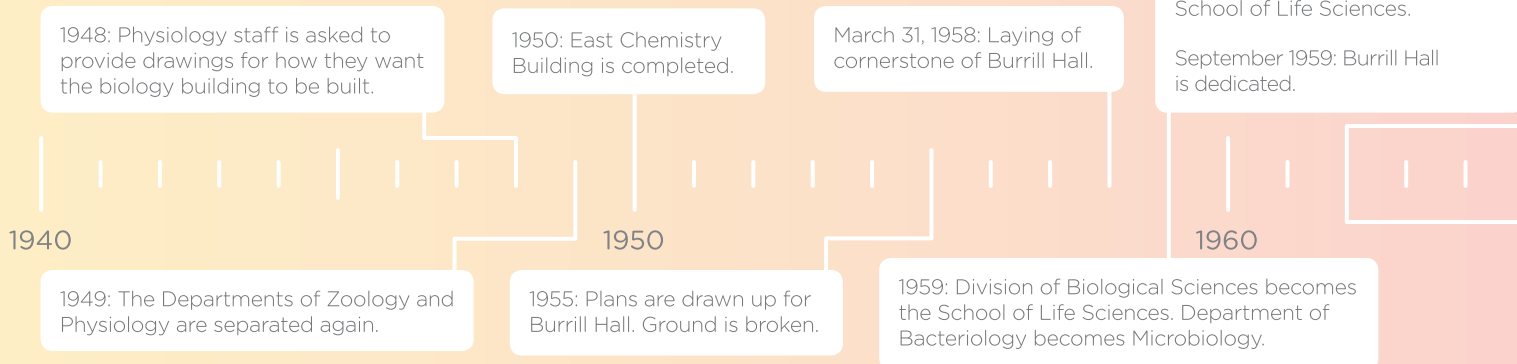
*Courtesy of University of Illinois Archives.*

Burrill Hall is named after Thomas J. Burrill, one of the first faculty members and administrators of the University of Illinois. Burrill is considered to be the father of the science of plant pathology and he taught the world's first general bacteriology course.

In 1933, rumors began to circulate that a new biology building, in addition to the Natural History Building, was to be built. However, due to disagreements between the Illinois legislature and governor that delayed its funding, the Burrill Hall groundbreaking ceremony did not occur until late 1955. In February 1959, the building was completed, and by August 1959, the Departments of Physiology, Microbiology and Biophysics, as well as the Biology and Botany Departmental Libraries, had completed their moves to the new building.

Since its opening, Burrill Hall has gone through several major changes. In 1970, university trustees approved plans for an addition to increase the number of research and teaching laboratories so as to increase the number of medical doctors being trained in Illinois. Recently, space adjustments

# MCB TIMELINE

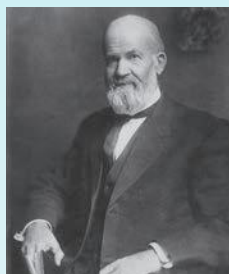


Plot plan showing Main Campus. Buildings include Altgeld Hall, Illini Union Building and Addition, Harker Hall, Natural History building, Burrill Hall, Administration Building, Noyes Chemistry Laboratory.  
*Courtesy of University of Illinois Archives.*

within the School of MCB have created large-scale renovations for the building in both research laboratory and instructional spaces. The new instructional spaces on the second floor utilize modular lab spaces that can be organized for each individual course to promote an active and collaborative learning environment. Burrill also hosts the MCB Learning Center, furnished with computers and large tables which allow students to meet with their teaching assistants and fellow students easily.

Plans are in the works to convert the former Biology Library into a consolidated and modernized instruction and advising space.

## Thomas J. Burrill (1839–1916)



Thomas J. Burrill, circa 1890s.  
*Courtesy of University of Illinois Archives.*

Thomas J. Burrill was born in 1839 in Pittsfield, Massachusetts. After graduating in 1865 from Illinois State Normal University (its name then reflecting its primary mission as a teacher training institution, at that time called a “normal school”), in 1868 he became an associate professor of Botany at the University of Illinois (then called Illinois Industrial University), just one year after it was founded, becoming department head in 1892. While studying a disease called pear blight in 1880, he discovered evidence that microorganisms cause disease in plants; he is now considered the father of bacterial plant pathology. Burrill is credited with teaching the first American course in bacteriology, and introducing laboratory study in the classroom—being the first to put microscopes in front of students, a tradition that continues in the MCB undergraduate curriculum.

In addition to his roles as a pioneering research scientist and professor, he also served as the acting president of the University beginning in 1891. During his presidency, he increased faculty power; increased faculty salaries to make the university more competitive with other Midwestern universities; abolished the loyalty oath, demerit system, and compulsory chapel; established the Graduate School; expanded the enrollment of women students; and emphasized research in the undergraduate curriculum, reinvigorating several subjects—notably in the liberal arts—and expanding the number of courses by 45 percent. While his eight years as president were highly influential, setting the university on a course it continues on today, he declined a permanent presidency because of his love of teaching and research.

After his death in 1916, entomology professor Stephen Forbes said, “If [Burrill] may not be called the Father of the University of Illinois, he was at least its elder brother, intimately acquainted with its aims, character, and history. Long may he live in these halls and on this campus, in memory, in spirit, in example, and in the gratitude and honor of all good men.”

## Interview with Rich Burrill, Great Grand-Nephew of Thomas Burrill



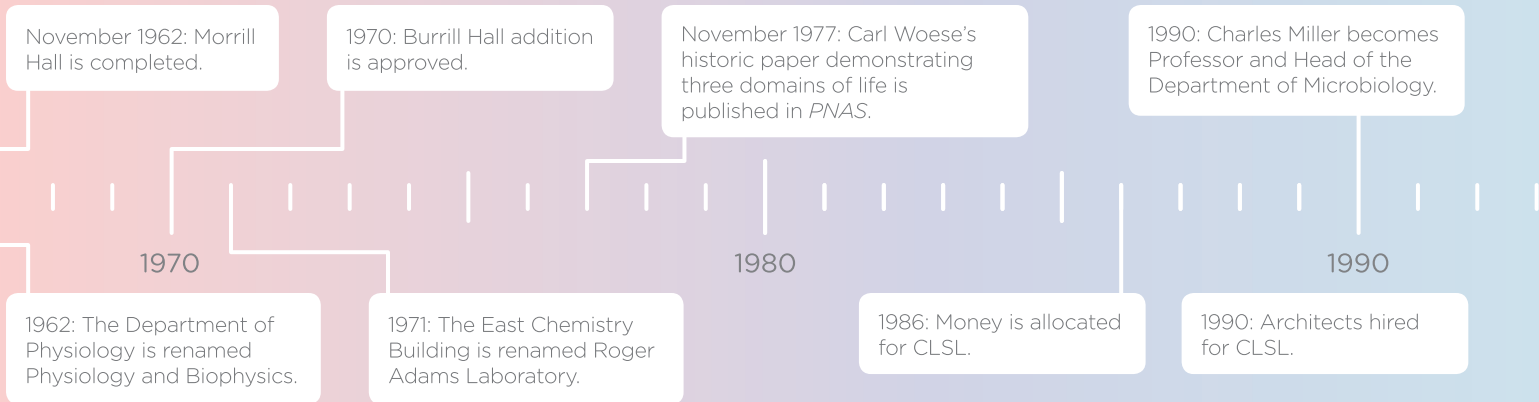
### What do you think made your great grand-uncle unique in his relationship with the university?

He was clearly very passionate about his duties at the university, especially in terms of his research and scientific discoveries. His

dedication to the university and sometimes controversial views on how the university treated both students and faculty were instrumental in making the University of Illinois what it is today. His impact on scientific discovery through research and its importance in the development of “scientific thinking” opened the door for undergraduate as well as graduate students to gain practical experience found at few other universities.

### Do you have any fond or interesting memories of Burrill Hall?

My visit in August 2012 was my first to Burrill Hall and the university. It was a pleasure and delight to see the legacy of my great grand uncle and his influence over the years. Burrill Hall is truly a magnificent memorial to my uncle’s impact at Illinois. The modernization effort currently underway will enhance the educational experience for the thousands of students in the MCB program, furthering Thomas’s legacy.



# MORRILL HALL



Assumed to be a proposal drawing of Justin Smith Morrill Hall (known as the Entomology Building during construction).  
 Courtesy of University of Illinois Archives.



Morrill Hall, date unknown.  
 Courtesy of News Bureau Archives.

Completed in November 1962, Morrill Hall is named after Justin Smith Morrill, US Representative from Vermont. His Morrill Land-Grant Colleges Act of 1862 granted each state public land for the founding of a public university based on the number of senators and representatives the state had in Congress. The act was signed into law by President Lincoln, leading to the formation of 69 universities. According to Visiting Archival Specialist Ryan Ross, “Prior to the passage of the Morrill Act, only the very privileged class could afford to attend universities.”

Throughout its construction, Morrill Hall was referred to as the “Entomology Building” because of its use in a project sponsored by the National Institutes of Health to study arthropod-borne diseases. The building originally housed members of the departments

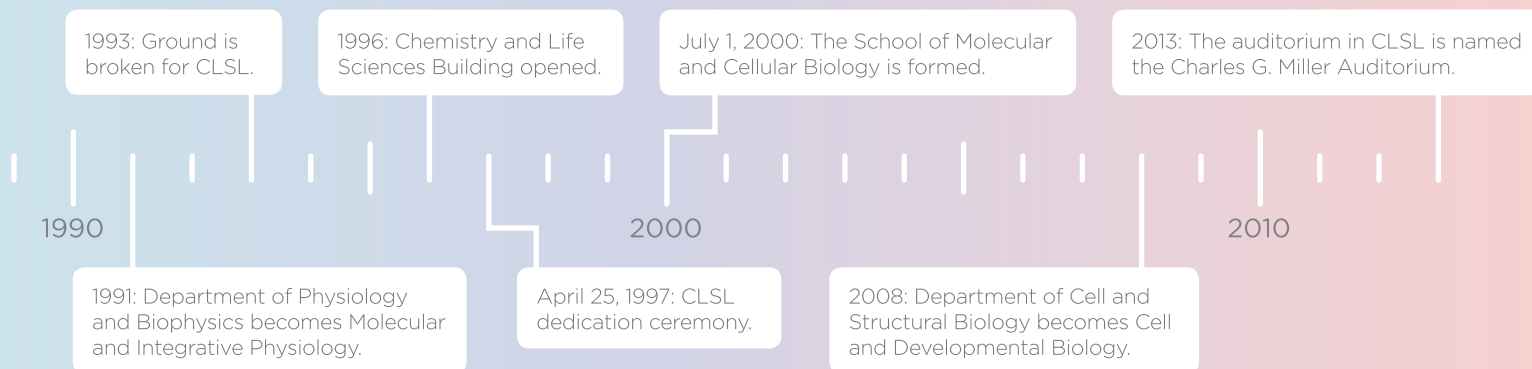
of Entomology, Botany, and Zoology. A press release announcing its naming says that the building was created to “reflect the university’s broad interest in research and instruction, emphasized since the early days of science, and cooperative arrangements between state and federal governments in encouragement of the program of land-grant universities.”

A 1964 addition tripled the size of Morrill Hall and increased space for new research laboratories and the administrative offices of the original School of Life Sciences. A bridge on the second and third floors to Burrill Hall was also added at that time.

Today, the School of MCB shares the building with the School of Integrative Biology. The departments of Cell and Developmental Biology, Microbiology, and Biochemistry all have a presence in the space.



# MCB TIMELINE



## CHEMICAL & LIFE SCIENCES LABORATORY



Chemical and Life Sciences Laboratory architectural drawing. Courtesy of News Bureau Archives.

The Chemical and Life Sciences Laboratory (CLSL) opened in the spring of 1997. The university originally allocated the money for the interdisciplinary building in 1986 and hired architects in 1990. However, after the 1993 groundbreaking, a series of events, including a concrete contractor strike and heavy spring and summer rains, delayed the building's completion. Research groups finally began moving into the state-of-the-art 227,500 square foot building in the fall of 1996.

According to the *News-Gazette* (2 July 1995), "at \$61 million, it's the most expensive project ever undertaken by the University of Illinois—though Memorial Stadium would cost more to build today." Upon opening, one of the facility's crown jewels was a \$5 million Keck nuclear magnetic resonance center.

At the time, current School of Molecular and Cellular Biology Director Stephen Sligar, who was then the director of the School of Chemical Sciences, said, "The facility will allow us to physically and intellectually bridge the gap between the chemical and life sciences."

This goal has certainly been accomplished. The A wing of the building is predominantly occupied by Department of Chemistry laboratories, but a short walk over the bridge that spans the former California Avenue leads to the School of MCB's B and C wings. The Departments of Cell and Developmental Biology and Microbiology are located in this northern section of CLSL. ■

#### FOR FURTHER READING

*Student Life at the University of Illinois 1967–Present*

<http://archives.library.illinois.edu/slc/researchguides/timeline/index.php>

*C. Ladd Prosser: Scientific Autobiography and Personal Memoir* (Stipes, 2002), edited and produced by Essie Meisami (see page 29) and Ian Meinertzhagen

#### A MESSAGE FROM THE DIRECTOR

Throughout this issue of the MCB magazine, you will find frequent references to our facilities from several vantage points—from an important historical perspective, highlighting such figures as Thomas Burrill and Roger Adams, to the state-supported facilities such as the Chemical and Life Sciences Laboratory (CLSL). Looking into the future, it is vitally important for us to continually plan for the needs of our outstanding faculty and talented students. Classroom spaces in all the current facilities are generally managed by the campus. It is important that we annually make the case to Chancellor Phyllis Wise, Provost Ilesanmi Adesida, and others the needs for updated lecture, classroom and seminar spaces to accommodate the impressive growth of our undergraduate population.

We have been fortunate in identifying various sources of departmental and school funds to enable us to renovate various laboratory and office spaces, and we will continue to work on a short-term plan. However, as state resources continue to diminish, it is incumbent on us to develop a long-term facilities plan. The importance of strategic partnerships with industry as we look at such a plan will be crucial, as will the support of friends and alumni across MCB departments with multiple naming opportunities. Future communications will keep you apprised of this planning process. In the meantime, I welcome your feedback on the physical spaces within MCB.

—Stephen Sligar



This February, the B103 Auditorium was renamed the Charles G. Miller auditorium, following a redesign of a three-story atrium to give MCB a distinctive architectural presence, and provide a focal point for the school's many buildings. Highlights of the new environmental design include a lightbox gallery showcasing scientific imagery from researchers in each of the four departments, two-story high banners, and a translucent blue MCB sign covering a large window, all creating a striking visual impact from within and outside, especially at night.