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## *A Century of Science*

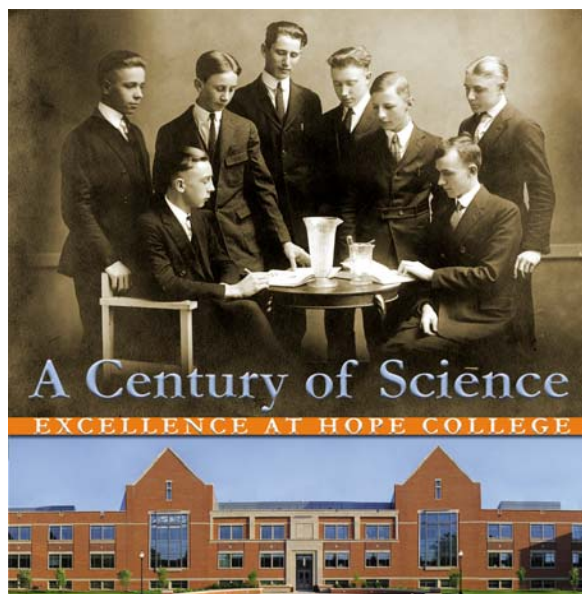
by Dr. Moses Lee, Dr. Graham Peaslee with Valerie van Heest

More than one hundred years ago, a small, retrofitted wooden storage building became the first chemistry laboratory at Hope College. In that primitive building, the faculty and students began the groundbreaking practice of pursuing the essential experimental nature of science, following the conviction that scientific learning is best achieved by doing science. During the last century, the science faculty at Hope has dedicated themselves to the pursuit of excellence in science. One hundred years and five buildings later, the Hope College Natural and Applied Sciences Division encompasses eight departments, with research a central focus of each program. In 2009, the college celebrates the hundred-year anniversary of the founding of the chemistry and physics departments at Hope College, and through the vision and leadership of many great professors in the past one hundred years, excellence in science has become, in the words of Aristotle, “not an act, but a habit.”

The early 1900s at Hope College saw much change coupled with milestone achievements. In 1894, mathematics professor Gerrit Kollen ascended to the presidency of Hope College and began what can now be viewed as a period of transition, resulting in the evolution of the idea that the sciences were important, desirable, and sought-after professions. During Kollen’s presidency, the science

division at Hope College underwent a critical change in mindset. Hope actively pursued the hiring of faculty trained in their respective science disciplines rather than theology. Many milestone accomplishments can be attributed to the

early 1900s. The era was jumpstarted in 1893 with the hiring of Douwe B. Yntema to act as chair of the chemistry and physics department. During Yntema’s time, Hope College continued to improve its laboratory facilities. The college outfitted a former chapel in the basement of Van Vleck Hall with water and purchased equipment and reagents to be used in these laboratories. In 1903, William A. Dehn became the first Hope alumnus to be granted a Ph.D. degree, from the University of Illinois. Coupled with the success



of Hope’s alumni and the innovative approach to education, Hope College became a pioneer in science education. In keeping with this pursuit of excellence in education, in 1903, Van Raalte Hall became the first of five buildings constructed specifically to house the sciences, a dream come true for Hope College. Visionary in its construction, Van Raalte Hall contained darkrooms and laboratories specifically outfitted for each of the science disciplines (biology, chemistry, and physics). In 1904, Almon T. Godfrey, M.D., joined the faculty to assist Yntema as instructor of chemistry and physics. A demanding professor,

*(continued on page 2)*

## From the Director



This year marks the one hundredth anniversary of the science programs at Hope College. In this issue of our newsletter, you'll get a glimpse of what's contained in the recently released book, *A Century of Science: Excellence at Hope College*. I'm sure you'll want to get your own copy of the book, so ordering information is included at the end of the article.

Geoffrey D. Reynolds

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### *Century of Science (continued from page 1)*

he rewarded student success with opportunities to serve as assistants in the laboratory, introducing the concept that "scientific learning is best achieved by doing science." In 1908, Godfrey became an assistant professor and, with the continued successes of the sciences, in 1909, the department of physics and chemistry became two separate departments, with Godfrey serving as the chair of the chemistry department until 1923 and Yntema serving as chair of the physics department.



Almon T.  
Godfrey

The vision and leadership of the 1900s formed a pivotal foundation for the emerging science education, and this foundation has held the strength for the future continuing pursuit of excellence in science education at Hope College. Despite the tough economic times of the late Depression era, fundraising began for a new building to house the science



*Chemistry students at work in a new state-of-the-art science lab in Van Raalte Hall, 1904*

facilities. The new science building (which would later be called Lubbers Hall), dedicated in 1942, became home for the departments of chemistry, physics, and biology. This was truly an era of vision and growth. In the post-war era, commonly referred to as the *Sputnik* era, scientific inquiry and rapid technological advancement fueled economic prosperity. The development of an intellectual capacity to pursue this inquiry became a national priority that revolutionized science education at Hope College, and led to its rapid growth.

With the passing of Almon Godfrey during the presidency of Edward Dimment, Gerrit Van Zyl accepted the appointment of chemistry chair and began his forty-one years of service. The chemistry department, in keeping with the progress of the science division, flourished. During this time period, an astonishing 125 Hope chemistry graduates earned Ph.D. degrees in chemistry. Van Zyl aspired to build a national reputation for the science division of Hope College. He accomplished this mission in part by recognizing the importance of attending the national American Chemical Society meetings. In preparation for these meetings, he studied the prominent contributors to these meetings, and set out to form relationships and introduce Hope College to this national playing field. Van Zyl pioneered the idea of undergraduate research long before it



Gerrit Van Zyl

became fashionable. In 1947, he began a research project with a Hope student, Eugene Van Tamelen, and he continued his research work with students until retiring in 1964. This initial project grew into a program funded by foundations such as Research Corporation and American Chemical Society Petroleum Research Fund, involving students in projects investigating chemistry. This research also generated a stream of peer-reviewed publications, thus further increasing the national recognition of Hope College. The idea of research was not limited to the chemistry department. In fact, Harry Frissel, the first physics faculty member to earn a Ph.D., became the first Hope professor to obtain funding from the National Science Foundation, which created a summer institute for high school physics and mathematics teachers. This grant proved to be the first of a long-standing tradition of teaching and research programs for high school teachers and college students.

It is clearly evident that this period reflects a time of scientific growth at Hope College. The vision of excellence in science continued developing with the appointment in 1963 of Calvin Vander Werf as the eighth president of Hope College. A Hope College alumnus, Vander Werf recognized the vast opportunities available due to the relatively abundant science education funding of the post-*Sputnik* era, and Van Zyl's vision to hire young scientists interested in combining teaching and research with undergraduate students. Today, many of these hires are nationally recognized leaders in the field of undergraduate research. Doug Neckers left many legacies, including the fundraising for the purchase of a nuclear magnetic resonance spectrometer, the first major scientific instrument to be acquired by Hope College with the help of outside funding. This began a tradition of securing research-grade equipment through grant proposals to private and federal foundations. This practice is still alive today, as evidenced by the 2003 award of \$680,000 from the National Science Foundation for a Pelletron particle accelerator, the largest grant for scientific equipment in Hope's history. Only a few dozen institutions worldwide have comparable equipment. These purchases and acquisitions have been instrumental in allowing Hope College to perch itself on the cutting edge of research.

The latter 1900s at Hope College can be characterized by more growth and more science facilities. In 1964, a new building, now known as Vander Werf Hall of Physics and Mathematics, housed the departments of mathematics, physics, and computer science. During this time, Jerry Mohrig received Hope's first National Science Foundation Undergraduate Research Participation grant. The departments continued to be awarded these grants through the duration of the program and, in 1982, funds sponsored 100 students in scientific research.

Making excellence a habit requires always seeking improvement. In 1967, under the direction of physics professor Richard Brockmeier, Hope received \$375,000 from the Alfred P. Sloan Foundation to develop an integrated science curriculum, the first in a series of three institutional grants that have shaped the interdisciplinary science division of Hope College today. These funds allowed for the increase in science faculty, the purchase of scientific instruments, and the improvement of the research and teaching facilities, as well as being the impetus for the creation of the geology department.



*Science faculty, as identified in the 1974 Milestone, left to right: Donald H. Williams, Lynn M. Hoepfinger, William S. Mungall, F. Sheldon Wettack, Barbara J. Barken, Eugene C. Jekel, Michael P. Doyle, and Irwin J. Brink*

The Vander Werf era saw the completion of yet one more facility to house the exponentially growing science division, and the continued success at a national level of our younger science faculty. Sheldon Wettack and Michael Doyle both had active research groups supported by external research dollars. Furthermore, both introduced to Hope College the participation of postdoctoral research associates in the undergraduate research arena. Wettack continued to lead the division with his role as dean for the natural and social sciences during the years 1974 through 1982. Doyle had made many prestigious accomplishments during his tenure at Hope College, including a Chemical Manufacturers Association Catalyst Award for Excellence in College Chemistry Teaching and a Camille & Henry Dreyfus Teacher-Scholar Award. The legacy of excellence was further enabled under the leadership of James Gentile, an integral part of the Natural and Applied Sciences Division as a scholar-teacher, department chair, and dean from 1988 to 2004. The prestigious American Association for the Advancement of Science honored him as a Fellow in 2004.

The one hundredth anniversary of the chemistry and physics departments at Hope College is a wonderful time to celebrate and reflect upon the vision, hard work, and accomplishments of our predecessors, while at the same time looking to the promising future that lies ahead. The Natural and Applied Sciences Division of Hope College is a very different place today. The eight departments now include biology, chemistry, computer science, engineering, geological and environmental sciences, mathematics, nursing, and physics. The faculty, like their predecessors, adheres to the highest standards of teaching and scholarship

and actively works to fully involve students in the educational experience. Many in the faculty are recognized as outstanding teacher-scholars at the state and national levels.

Hope College embraces an institutional core liberal arts curriculum emphasizing interdisciplinary learning and educating the entire person: mind, body, and spirit. The chemistry, nursing, and engineering programs are respectively accredited by the American Chemical Society, the Commission on Collegiate Nursing Education, and the Engineering Commission of the Accreditation Board for Engineering and Technology. Furthermore, Hope continues the tradition of research as a central and foundational component of the teaching philosophy. Students are given the opportunity to participate in meaningful research projects with faculty mentors. These programs are funded by numerous sources: National Science Foundation, National Institutes of Health, Homeland Security, Research Corporation, Petroleum Research Fund, Whitaker Foundation, Pew Foundation, National Aeronautics and Space Administration and the Michigan Space Grant Consortium, Howard Hughes Medical Institute, and others. In 2008, the science division received more than \$3 million in external grants and awards. Students are often co-authors of publications in scientific journals and present their discoveries at regional and national professional meetings. In 2008, the faculty produced close to twice the national average number of scientific publications among



*Modern lab in the A. Paul Schaap Science Center*

undergraduate institutions in the nation. In addition to research, Hope offers a multitude of internships with national laboratories and private industry, both within the United States and abroad. With these broad active learning experiences, the well-educated graduates are highly sought after by leading graduate and professional schools, as well as

industry. The program is not only designed to prepare students for a wide variety of opportunities in each of the disciplines and across multiple disciplines, but is also ideally suited to nurture students interested in professional programs that require scientific and technical backgrounds.



*A. Paul Schaap '67*

Furthermore, students today pursue their studies in well-equipped and spacious facilities, including the brand-new A. Paul Schaap Science Center, which also includes the recently renovated Peale Science Center. The new buildings encompass more than 150,000 square feet, and include twenty-one teaching laboratories, thirty faculty research laboratories, contemporary teaching and research equipment, and a science museum that emphasizes community outreach.

Our country continues to face a serious national threat of not producing enough scientists, technologists, engineers, and mathematicians to meet our current and future challenges, and this is presently exacerbated by the economic challenges gripping the nation. In recent years, we have seen a decline in the pool of students pursuing career paths in STEM (science, technology, engineering, and mathematics) fields, particularly among underrepresented minorities and women. This concern is compounded by what the country faces in a new era of “outsourcing” of technology and manufacturing to countries with cheaper labor costs. The growing numbers of STEM degree graduates in Asian and European countries further exacerbates the need for greater federal support for STEM programs. A 2005 National Science Board report showed that the United States ranked seventeenth among developed nations in the proportion of college students majoring in science and engineering. In 1975, the United States ranked third.

In 2005, Hope College’s Natural and Applied Sciences Division developed a strategic plan called Vision 20/20, aimed at enticing more students to pursue majors and eventually careers in STEM fields. The strategic plan involves accomplishing this goal by growing the STEM program at Hope College to uncharted excellence, and encouraging more students to pursue STEM majors, while simultaneously increasing the level of ethnic and cultural diversity in our programs and building relationships with institutions in other countries.

Hope's Natural and Applied Sciences Division has made significant progress toward the strategic vision by the steadfast commitment to the principle that "scientific learning is best done by doing science." To best serve the students, disciplines, institutions, and nation, Hope faculty continue to be inspired by a quote from Michael P. Doyle, former chemistry professor at Hope, past president of Research Corporation, and now professor and chair of the chemistry department at the University of Maryland in College Park: "A faculty with local recognition can assist students at the local and regional levels, but a person with national recognition will open doors virtually anywhere." As testimony to this commitment, in the past four years more than 150 students have participated in the summer research program, and more than 120 students continue to work on their research projects year-round. To support this level of research, the Natural and Applied Sciences Division has, on average, garnered more than \$2 million in external funding each year for the past four years.

As Hope pursues the Vision 20/20 strategic plan, the college is committed to two priorities: to make a positive difference in each individual student's life, and to contribute to society by preparing new generations of leaders in the sciences. The programs impact all ages and all levels of the scientific community, including groups currently underrepresented in the sciences.

The year-long celebration includes on-campus commemoration activities for the students, faculty, and even the alumni at homecoming, and a monthly seminar series that invites some of our illustrious graduates from each Natural and Applied Sciences Division department back to campus as inspiration for both the students and faculty. It is the intent of the book about the history of the sciences at Hope College that the division will be remembered long after the celebration, and indeed long after the entire year has passed. It is intended to be a testament to the many authors who contributed significant pieces to the effort, including Irwin J. Brink, who was an early mentor to others when they joined the faculty. As you read through the incredible combination of circumstances that yielded such an exceptional sciences division that exists today at Hope College, it is likely that you will recognize that it is the culmination of years of effort by many talented scientists and scholars who built Hope's distinctive reputation in the sciences. Producing a book every century or so, which

details their extraordinary efforts, seems quite reasonable in this perspective.

This book could not have been published without the support and leadership of the current college administration: President James E. Bultman and Provost and Chief Academic Officer James N. Boelkins. As one more interesting twist to this continuing story, both Dr. Bultman and Dr. Boelkins not only graduated from Hope College, but each majored in the sciences. Dr. Bultman, a chemistry major, graduated in 1963, and Dr. Boelkins graduated three years later, earning a B.S. in biology. They represent not only a long tradition of Hope alumni who have returned to serve their alma mater as senior administrators of the college, but Dr. Bultman is among a long line of natural scientists who have served as president of the college. In fact, five of the eleven college presidents, including Charles Scott (1886-1894), Gerritt J. Kollen (1894-1912), Calvin A. Vander Werf (1963-1972), Gordon Van Wylen (1972-1987), and Dr. Bultman (1999-present) have been trained as natural scientists. While natural scientists tend to gravitate toward leadership positions in academia in general, having almost half the presidents of Hope College with a scientific background is an unusually high percentage. This may help explain why Hope has developed such an illustrious national reputation in the sciences.

As the second century of chemistry and physics at Hope College unfolds, and the students, faculty, alumni, and administrators all seek to improve upon an already outstanding reputation and deliver continued academic excellence to successive generations of students in the context of the historic Christian faith, this modest book serves as an example of those who led the way, and upon whose shoulders the faculty of today stand.

*A Century of Science: Excellence at Hope College*, edited by Valerie van Heest, is published by Hope College and contains over 150 images from the collection of the Joint Archives of Holland and was prepared with the assistance of archives staff. The large-format, full color, "coffee table" book is available on line at <http://www.hope.edu/academic/natsci>, or by calling (616) 395-7190. The cost is \$29.95 and your purchase supports science education at Hope College.



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*Hope College faculty 1902-1903—forefront: Rev John T. Bergen; first row (left to right): Henry Boers, James G. Sutphen, President Gerrit J. Kollen, Cornelius Doesburg, John Nykerk, Henry Veghte; back row: Edward Dimment, Samuel O. Mast, Frank N. Patterson, John H. Kleinheksel, John G. Winter, and Douwe B. Yntema*