

## **A Short History of Chemistry at Acadia University 1913-2013**

**John M. Roscoe, Emeritus Professor, Department of Chemistry**

Since 2013 marks the 100<sup>th</sup> anniversary of the Chemistry Department at Acadia, it seems appropriate to reflect on the history of chemistry at the university. The first instruction in chemistry was provided by Isaac Chipman who was appointed “Professor of Mathematics and Natural Philosophy” in 1839, the year after the university was founded. The separate scientific disciplines were just emerging as distinct entities at that time and chemistry was included under the umbrella of natural philosophy. While the Chemistry Department celebrates its centenary in 2013, chemistry as an academic subject has been taught at the university for nearly 175 years. The first 113 years of chemistry at Acadia were described by Dr. Chester W. Small in an article in the Acadia Bulletin of May, 1952. In what follows, the highlights of Dr. Small’s description will be summarized and the reader may wish to refer to Dr. Small’s article for more detail.

### *A Little Prehistory*

Chemistry began to emerge as a discipline at Acadia in the latter half of the 19<sup>th</sup> century. By 1854, chemistry was a required subject of all students at the university in the second term of third year and the first term of fourth year. In 1863, organic chemistry was included in the second year, marking the initial subdivision of chemistry into distinct sub-disciplines. In 1869, chemistry and geology were separated from the other sciences with the appointment of William Elder, A.M., as “Professor of Chemistry and Geology”. Instruction in chemistry was moved to the first year and an optional honours course in organic and agricultural chemistry was added to the curriculum. Mr. Elder left Acadia in 1872 to take the position of Professor of Chemistry at Colby College. He was succeeded, sequentially, as “Professor of Chemistry and Geology” by the geologists George T. Kennedy, Albert Coldwell, and Ernest Haycock. During their tenure, the number of faculty members gradually increased and the chemistry curriculum was expanded by the addition of courses in qualitative analysis and quantitative analysis as electives. A major step occurred in 1909 when Carnegie Science Hall was built. This initially housed biology, chemistry, geology and physics. The photograph below shows “the quad” as it was in 1915, two years after the new Chemistry Department was born and six years after construction of the Carnegie Science Building. In 1925 the Geology Department moved to the administration building and in 1929 the Biology Department moved into the newly constructed Patterson Hall, then known simply as “the New Science Building”. However, the Chemistry Department remained with physics in Carnegie until Elliott Hall was opened in 1960.



## *The First Fifty Years*

The separation of chemistry as an independent academic department took place in 1913 with the appointment of Dr. Joseph A. Ambler as Acadia's first "Professor of Chemistry". Dr. Ambler obtained both his undergraduate and graduate education at Yale, receiving his Ph.D. in 1913, the same year in which he became the Head of the Chemistry Department at Acadia. The 1921 edition of American Men of Science lists his specialties as "coal tar intermediates, pyrimidins, pseudothiohydantoin, amines and sulphonic acids". Under his leadership, the teaching of organic chemistry was expanded to a full course. Dr. Ambler left Acadia in 1916 to take a position as assistant petroleum chemist in the colour laboratory of the Bureau of Chemistry, U.S. Department of Agriculture, where he appears to have spent the rest of his career. The Acadia academic calendar for 1916 lists seven undergraduate chemistry courses and an additional three honours courses in analytical chemistry, organic chemistry, and industrial chemistry. This marked a significant increase in the number of courses devoted to distinct aspects of chemistry. However, it is unlikely that, with only one faculty member and a fairly small number of students specializing in chemistry, they would all have been offered every year. Dr. Ambler died in New Orleans in 1948.



With the resignation of Dr. Ambler, Professor Haycock agreed to temporarily assume Dr. Ambler's duties until a permanent replacement could be found. In 1917, Dr. David Upton Hill agreed to come to Acadia as Head of the Chemistry Department, a position which he held for a remarkable 39 years, retiring in 1957. Dr. Hill obtained his undergraduate education at the University of New Brunswick and then attended Yale where he obtained his M.A. and Ph.D. He also taught chemistry at Yale for several years before accepting the appointment at Acadia, so it is conceivable that he had known Dr. Ambler as a graduate student. Dr. Hill was widely respected at Acadia. His compassion and dedication to his students were legendary and his quiet and polite but persistent approach to management of the Chemistry Department resulted in its steady growth and evolution in stature.



Dr. Hill was the only faculty member in the Chemistry Department for nearly a decade. With the end of the First World War in 1918, there was a large influx of veterans who were largely interested in taking courses in the sciences and engineering. This resulted in a large increase in class sizes in chemistry to which Dr. Hill adapted with his characteristic dedication and energy. He often commented on the excellent help provided by student assistants in these early years. As today, undergraduate assistants appear to have played a crucial role in the teaching of chemistry even in the early life of the Chemistry Department. In spite of this increased work load, Dr. Hill introduced an additional laboratory course in physical chemistry in 1920. In 1926 a further increase in the demands on chemistry took place with the establishment of the School of Home Economics at the university. Students in this new academic unit required a minimum of three full year courses in chemistry, including a course in biochemistry. This not only increased the number of students served by the Chemistry Department, but it also necessitated the introduction of a new course, biochemistry. In response to this increased demand, the university appointed a second chemistry professor, Dr. Chester W. Small, in 1926.

Dr. Small had graduated in chemistry from Acadia in 1923 and undertook graduate study at Cornell University, the University of Toronto, and the Medical School of the University of London where he studied biochemistry. His appointment marked the start of a gradual and systematic growth of the number of chemistry faculty members in response to a corresponding increase in enrolments. Dr. Small remained at Acadia until his retirement in 1966, serving as Provost for eight years and as Head of the Chemistry Department from 1956 to 1966. He received D.Sc. degrees from McMaster, Memorial and Acadia in recognition of his dedication to teaching. This was reflected in the remarkable proportion of Acadia chemistry graduates who he encouraged to complete graduate degrees at major universities in Canada and the United States.



Not only had the establishment of the School of Home Economics made it necessary to add a faculty member to teach the new course in biochemistry, but the chemistry requirements for admission to medical schools and engineering schools were also becoming more extensive. In an effort to accommodate these increasing demands, Acadia appointed Dr. Walter A. DeLong in 1928 to a part-time faculty position teaching quantitative analysis and part of the large course in general chemistry. In addition to his work at Acadia, Dr. DeLong was engaged in research at the Dominion Agricultural Experimental Station in Kentville. The photo at the right shows the entire chemistry faculty complement in 1936: from left to right, Dr. Hill, Dr. DeLong and Dr. Small. It was provided by John C. Johnson who studied with Dr. DeLong for his Masters degree. His thesis, produced in 1936, is the oldest chemistry thesis in Acadia's library catalog.



In 1936, Dr. DeLong left to take a position at MacDonald College and Dr. Everett P. Linton was appointed to a full time faculty position, bringing the full-time faculty complement in chemistry to three. Dr. Linton obtained his undergraduate education at Mount Allison University and his Ph.D. in physical chemistry at McGill University. Except for a period of three years of service at the Fisheries Experimental Station in Halifax during the latter part of the Second World War, Dr. Linton remained at Acadia until his retirement in 1975. He served as Head of the Chemistry Department from Dr. Small's retirement in 1966 until 1975 and also managed the University's Summer School program for a number of years. After his retirement, Acadia conferred a D.Sc. degree on Dr. Linton in recognition of his outstanding service to the university. He retained a keen interest in the department after his retirement, often attending seminars. He died in 2003.



With the end of the Second World War, Acadia experienced a second surge in enrolment as a new group of returning veterans sought to advance their careers with a university education. The increased teaching demands in chemistry were met by a series of temporary appointments. Dr. Arthur Bourns, an Acadia honours chemistry graduate who had completed his Ph.D. at McGill, served for one year and was followed by two other Acadia honours chemistry graduates, Donald Vincent and Frank Stacey, before their departure to undertake graduate work. Once again, the services of a large number of undergraduate teaching assistants were critical in providing the necessary laboratory supervision for safe and effective laboratory instruction that is so essential for educating competent professional chemists. The increased demand on laboratory space required expansion of Carnegie and in 1947 a converted army hut was moved into place

behind the Carnegie building. This provided additional laboratory space for chemistry and was connected to the main building by a covered passage, separated from it by a fireproof door, possibly in anticipation of fires and explosions. With the retirement of Dr. Hill in 1957, Dr. Erik S. Hansen was appointed to teach organic chemistry. By this point, even the addition of “the hut” had proved inadequate to accommodate the instructional requirements of the Chemistry Department and efforts were under way to convince the university to construct a new building to be used exclusively for chemistry. Not only would this provide up to date laboratory facilities for experimental chemistry, but it would provide much needed additional space in Carnegie for the Physics Department which had also been experiencing increased instructional demands. Responsibility for moving forward with efforts to construct a new chemistry building, initiated by Dr. Hill, became the responsibility of Dr. Small when he became Head of the Chemistry Department in 1956 with the approaching retirement of Dr. Hill.

### *It's All Academic!*

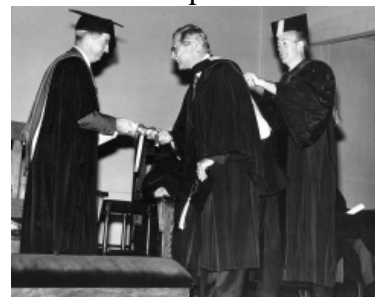
At this significant point in the history of the Acadia Chemistry Department, we pause to assess the evolution in both the number and nature of courses over Dr. Hill's 39 year tenure as Head. In 1917, Acadia graduated a total of 21 students and the 1917 university calendar lists the following chemistry courses: Chem 1, Elementary Chemistry; Chem 2, General Chemistry; Chem 3, Qualitative Analysis; Chem 4, Quantitative Analysis; Chem 5, Organic Chemistry; Chem 6, Physical Chemistry; and Chem 7, History of Chemistry. In addition, the calendar continued to list three honours courses: Advanced Organic Chemistry, Advanced Analytical Chemistry, and Industrial Chemistry. In 1918, Chem 6 was renamed Elementary Physical Chemistry, Chem 7 became Advanced Inorganic Chemistry, and the History of Chemistry course was renumbered Chem 8. With a total of eight full year chemistry courses, three honours courses, and only Dr. Hill as a faculty member, the teaching load was quite daunting! Possibly in an effort to moderate this heavy workload, in 1919 the History of Chemistry course was dropped and the Advanced Inorganic Chemistry course, Chem 7, became an honours course which could then be offered through independent study. This left the numbers Chem 7 and Chem 8 available for other course descriptions. In 1923, Chem 7 became an Essay course, open only to “chemistry majors with high standing”, and requiring “experimental investigation”. It also required completion of the analytical chemistry course as a prerequisite and, although not formally listed as an honours course, its requirements for admission suggest that it was only available to students of honours caliber and would have been a senior course requiring mostly independent work. This may have signaled the origin of the honours thesis in the Chemistry Department. In 1925, Chem 7 became Food Chemistry, possibly in anticipation of the inauguration of the Home Economics Program, and the essay course was renumbered as Chem 8. With the appointment of Dr. Small in 1926, Food Chemistry was renamed Biochemistry. At this point, Chem 1 through Chem 8 were the courses available to majors, and Chem 9 through Chem 12 were available as honours courses. Even with the appointment of Dr. Small as a second faculty member, the teaching load was impressive. The number of courses remained much the same until the opening of Elliott Hall in 1960, the main change being conversion of the essay course to an honours thesis course and its replacement by a second undergraduate organic chemistry course. Over this period, enrolments increased dramatically and the honours courses transitioned gradually from independent study to lecture and laboratory format. Their number increased slightly but most of them were only offered when there was sufficient demand.

The university calendar indicates that the Bachelor of Science degree was first conferred in 1906. However, it was rarely awarded and graduates with an interest in chemistry took a much more general degree than is available today. They usually obtained a Bachelor of Arts degree on graduation and the graduation lists suggest that the B.Sc. was normally awarded after additional study beyond the requirements for the B.A. degree. Although it is still possible to obtain a B.A. with a major in chemistry, that degree decreased markedly in popularity during the last half of the twentieth century. A significant proportion of Acadia chemistry graduates continued their education in the graduate programs at other universities in Canada and the United States, the majority attending Harvard, Yale, Columbia, Chicago, Toronto and McGill. By the time Dr. Hill retired, the graduating class had grown to 177, more than eight times the number when he was first appointed, and the total enrolment at Acadia was approaching 1000. In addition to the B.Sc. and B.A. degrees with a major in chemistry, the Chemistry Department was regularly graduating students with both the B.Sc. with Honours and M.Sc. degrees.

Although the first honours course in chemistry dates from approximately 1869, the nature of these courses was significantly different than it is today. No honours degree was available and students wishing to take an honours course were required to have an average of at least 80% in their first two years of study. They were also required to maintain an average of at least 80% during the last two years of their degree. Honours courses were expected to entail a large amount of independent study in the library or the laboratory and were more like a supervised reading course than a lecture course. In 1927, the requirements for the honours courses became better defined and required application to the university's Honours Committee at the start of the junior (third) year of study. The B.A. and B.Sc. Honours degrees are listed for the first time in the university calendar for the 1927-1928 academic year. They required a comprehensive examination at the end of the fourth year. This remained a requirement for the honours degree in chemistry until the early 1970s. The 1930 calendar lists the Honours degree, referred to as *Summa Cum Laude*, as requiring a "distinction major" of at least four courses and two minors of at least two courses each. For the first time, the calendar lists the requirement of a research project with a thesis.

When Dr. Hill arrived at Acadia, the only graduate degree offered by the university was the M.A. It was not until 1933 that the M.Sc. degree was first listed in the calendar. The oldest Acadia chemistry thesis in the university's library catalog, based on experimental work, is the M.Sc. thesis of John Charles Johnson in 1936. It is entitled "The Determination of the Boron Content of Apple Fruit at Different Stages of Growth" and is 19 pages in length. It was supervised by Dr. DeLong just before he left Acadia. The first B.Sc. Honours theses in the library catalog are from 1937. There are three of them: "A Study of the Derivatives of Succinic Acid" by Enid P. Knight, "A Comparison of the Relative Merits of Several Methods for the Preparation of Arginine Hydrochloride, and a Note on the Significance of Arginine in Animal Metabolism" by James MacDonald Richardson Beveridge, and "The Determination of the Calcium and Phosphorus Content of Fallen Apple Leaves" by Charles Alexander Escoffery. Dr. Beveridge went on to obtain his Ph.D. in biochemistry from the University of Toronto and his M.D. from the University of Western Ontario where he also taught biochemistry. He continued his interest in biochemistry, becoming an internationally recognized expert on heart disease. After a distinguished career at Western and Queen's, where he served as Head of the Biochemistry Department and Dean of Graduate Studies, he returned to Acadia to serve as its

tenth President from 1964 until his retirement in 1978. Dr. Escoffery obtained his Ph.D. in physical chemistry from the Massachusetts Institute of Technology. He spent his career in industry in the United States where he held senior positions with the Federal Telephone and Radio Corporation, International Rectifier Corporation, and Hughes Aircraft Corporation. Both Dr. Beveridge and Dr. Escoffery were awarded honorary D.Sc. degrees by Acadia. The photo at the right shows Acadia President, Dr. J. M. R. Beveridge, conferring an honorary D.Sc. degree on his classmate, Dr. Escoffery, with Dr. Hansen poised to place the hood on Dr. Escoffery. The Chemistry Department continued to produce a few honours graduates in most years and the occasional master's graduate. Initially, a few of these were for B.A. Honours and M.A. degrees but by the 1950s these had been entirely replaced by the B.Sc. Honours and M.Sc. degrees.



### *A Growth Spurt*

The appointment of Dr. Erik S. Hansen in 1957 in many ways marks the beginning of a period of growth for Acadia's Chemistry Department. Dr. Hansen graduated from Acadia with a B.Sc.(Honours) chemistry degree in 1949. He then entered graduate school at Yale, graduating with his Ph.D. Following several years with the Dominion Rubber Company, he returned to Acadia to join Dr. Small and Dr. Linton. In addition to his faculty duties, he had an outstanding career of service to Acadia, serving as Provost after Dr. Small retired and as Dean of Men and Dean of Students for many years, as well as serving as President of the Acadia Alumni Association from 1962 to 1966. Although he formally retired in 1993, he continued to teach in the department and in the extension program. At this writing, he is still teaching introductory chemistry through Open Acadia and must hold the record for number of years of chemistry instruction at the university. In 2013, he had been teaching at Acadia for 56 years! The appointment of Dr. Hansen, an organic chemist, provided some teaching relief for Dr. Small who had been carrying the full load of organic chemistry courses in addition to biochemistry and freshman chemistry, as well as serving as Provost and, with Dr. Hill's retirement, as Head of the Chemistry Department.



With the retirement of Dr. Hill, the Chemistry Department needed someone to teach Dr. Hill's specialties, analytical chemistry and inorganic chemistry. In 1959, the university offered a faculty position to Dr. Graeme E. Cheney, increasing the department's teaching complement to four. Dr. Cheney obtained his B.Sc. degree from Dalhousie University and his Ph.D. from the University of Pittsburgh. He was suggested by Dr. Walter Chute, an Acadia chemistry graduate who was a faculty member in the Chemistry Department at Dalhousie. Dr. Cheney's specialty, analytical applications of coordination chemistry, provided the link between analytical chemistry and inorganic chemistry that was needed and he became responsible for two courses in analytical chemistry and one in inorganic chemistry on a regular basis. He quickly developed a significant research program involving both honours and masters students. In spite of a gruff exterior, leading to his nickname of "the bear", he was always supportive of his students. Former undergraduates will remember his oral examinations which one had to pass before being allowed to do each experiment in the third year analytical chemistry



course. Success in this examination was accompanied by provision of a vial containing the appropriate analysed unknown for the experiment, with the correct answer known only to Dr. Cheney! However, success in these oral examinations also ensured that the students had a sufficiently solid understanding of the analytical method to make an accurate result reasonably certain. After only a decade at Acadia, Dr. Cheney suffered a fatal heart attack in 1970.



The picture at the left shows Dr. M. R. Elliott, Chairman of the Board of Governors from 1930 to 1960, turning the sod for construction of Elliott Hall. Dr. Small is shown at the far left, Dr. Hill and Dr. Linton are third and second from the right, and the President of the university, Dr. Watson Kirkconnell, is shown at the far right. The “finished product” is shown below. Not only was it much larger than the Carnegie building, the facilities it included were, at that time, “state of the art”.

The main lecture room with its theatre style seating was one of the largest on campus. In addition, there was a medium sized lecture room on the top floor and a small lecture room in the basement. Laboratory space was also greatly improved both in quality and quantity. The ventilation system in the Carnegie building had been focused on the large central chimney. The home-made exhaust system had been designed and built in the physical plant shops. The new chemistry laboratories had many more fume hoods, some of which were quite large. Smaller exhaust units were also provided at each work space in the organic chemistry labs. In the old Carnegie building, work with flammable solvents was made fairly safe by the use of heaters consisting of electric light bulbs in tin cans, again produced in the physical plant shops. In the new Elliott Hall, low pressure steam was provided in many of the labs for safer work with flammable solvents. All the work stations in the new laboratories were provided with electrical outlets in recognition of the increasing use of electrical apparatus in experimental chemistry. The amount of space for storage of chemicals was much larger and the more hazardous solvents were stored outside the building in a concrete bunker. There was also provision of distilled water “on tap” in the preparation rooms and in many of the laboratories, supplied by a central distillation system housed in “the penthouse” located on the roof.



In recognition of the increasing role of instrumentation in chemistry, an instrument room was provided on the top floor of the new building, equipped with a Perkin Elmer model 21 infrared spectrometer, the first piece of major instrumentation in the history of the department. This was the pride and joy of the faculty! The two pan “swing” analytical balances, used previously by undergraduates for precise weighing, were also gradually replaced with single pan “automatic” electronic analytical balances, reflecting the current practice in government and industrial labs as well as in larger universities. In general, the new facilities represented a major enhancement in Acadia’s ability to produce graduates with a modern background in experimental chemistry. However, life is not perfect even at Acadia. As construction costs grew, it became

clear that faculty would need to choose between having a freight elevator and having the basement completed. The choice was made, quite properly, to finish the basement, providing an undergraduate biochemistry laboratory, research labs, office space, and a classroom in addition to storerooms for equipment and chemicals. It would be approximately thirty years before the vacant elevator shaft would get an elevator. Consequently, heavy items, such as cylinders of compressed gases, had to be manually transported from the basement, to which they were delivered, to the upper floors. The combination of laboratory space dedicated to research and new instrumentation, including several pieces of equipment less costly than the infrared spectrometer, made it possible for the Chemistry Department to begin expansion of its honours and master's degree programs. This could be achieved because the new facilities made it realistic for faculty members to apply for significant research grants with which to purchase materials and equipment and to pay the stipends of research students. A significant part of the cost of this equipment was obtained from industrial donations obtained as a result of Dr. Small's efforts. It is fair to say that without this capacity to apply successfully for external research support, the department would not have been able to subsequently purchase additional equipment required both for doing acceptable research and for teaching its students modern experimental methods.

The construction of Elliott Hall in 1960 began a period of growth in both enrolment and infrastructure at Acadia as it also did at most other universities in Canada. This decade also saw an increase in the number of universities across the country, responding both to the "baby boom" and to the increasing realization that a good job required a university degree. I recall working on the registration line in September of 1961 when a celebratory cheer erupted as Acadia's registration passed the 1000 mark for the first time! Enrolment in the large service courses, introductory chemistry and organic chemistry, threatened to exceed the limits on lecture room capacity. Even with the large lecture theatre in Elliott Hall, the first year course filled almost every seat and it became evident that the burgeoning enrolments in biology and home economics, as well as in chemistry, would soon require more than one lecture section in first year chemistry. Dr. Hansen's administrative activities were also making increasing demands on his time, again as a result of the increased enrolments. In 1962, a search for someone to help with this increased teaching load, particularly in organic chemistry and introductory chemistry, was initiated and an offer was made to Dr. Ernest Zinck who joined the department in 1963.

Dr. Ernest E. Zinck was an Acadia graduate who had done his honours research with Dr. Hansen and was the first chemistry student to be awarded the Governor General's Medal on graduation. He had just received his Ph.D. from Harvard, where he had specialized in physical organic chemistry. His appointment increased the chemistry teaching complement to five and his initial teaching assignment included first year chemistry and fourth year courses in physical chemistry and organic chemistry. Like Dr. Cheney, Dr. Zinck quickly built a significant research group including both honours and masters research students. His enthusiasm for teaching soon became evident, both in his teaching of existing courses and his willingness to develop new courses for the department's students. After one of our Chemistry Club meetings, a few of us cornered Dr. Zinck asking him to teach us a graduate course in photochemistry, spectroscopy and statistical thermodynamics. He convinced us that this would require three separate courses, but he would be prepared to teach one of them. We decided on





spectroscopy and he proceeded to work up the material during the following summer. The course he produced was superior to the equivalent course taught at McGill at the time, and I recall helping McGill graduate students with their spectroscopy course occasionally when I entered graduate school there in 1966. Dr. Zinck continued to focus on course development throughout his career. He introduced the self-paced approach to teaching introductory organic chemistry, allowing students to proceed through the course at their own pace, provided they passed an examination on each module before going on to the next one. He also co-authored a successful high school chemistry textbook with one of his former students, Ron Whitman. This may well have been his most significant achievement since the book made an important contribution to improving chemistry instruction in the public school system. He served as Head of the Chemistry Department and as Dean of Science during a fiscally challenging period for the university in the 1980s. He retired in 1997 after 34 years of service but continued to teach a section of first year chemistry for an additional year. He has recently returned to the department as a chemistry tutor.

The retirement of Dr. Small in 1966, the increasing enrolments, and the evolving importance of active research by faculty as a criterion for advancement meant that additional faculty members were required. In 1966, a search was made for a physical chemist and for an organic chemist who could also teach the biochemistry course. That fall, Dr. Brian P. Robinson accepted the organic chemistry position and Dr. David A. Stiles accepted the physical chemistry position. The following year, the department was also authorized to hire an inorganic chemist and Dr. Michael E. Peach joined the department. This brought the faculty complement in chemistry to seven. All three new faculty members quickly established active research programs with both honours and masters students. Dr. Peach was particularly successful, obtaining funding for a second infrared spectrometer, and soon had obtained funding to employ the department's first postdoctoral fellow. Research-based instruction in the department was showing the same rapid growth that was characterizing chemistry departments in the rest of Canada. Although Dr. Robinson left Acadia in 1971, Dr. Peach and Dr. Stiles remained at Acadia until they retired.

Dr. David A. Stiles obtained his Ph.D. in physical chemistry at the University of Birmingham in England and did postdoctoral work at the University of Alberta. In 1966, he joined Acadia's Chemistry Department teaching courses in physical chemistry and introductory chemistry. His research was initially in physical photochemistry but opportunities for collaboration with staff at the Agricultural Research Station in Kentville soon led him to diversify his research to include projects in pesticide persistence and transport in the environment. His research support was initially from NSERC and the collaboration with Agriculture Canada provided an additional source of research funding. Following a sabbatical leave in England, he introduced molecular emission cavity analysis to the department as an analytical tool for halogenated organic compounds. This interest in environmental analytical chemistry led him to divert much of his teaching from physical chemistry to analytical chemistry. This ultimately led him to service as Assistant Dean for Environmental Science, directing the university's multidisciplinary Environmental Science Program established in 1995. He was also heavily involved in the establishment of Acadia's Food Science Department in 1987, serving as chair of the committee responsible for its organization. He served as Head of



the Chemistry Department during the early 1980s, a period of fiscal retrenchment at Acadia, and for a time was acting Dean of Science and acting Director of Research and Graduate Studies. This was a period of government pressure to reduce spending at universities which made these positions particularly challenging. He retired in 2003 after 37 years of service to Acadia.

Dr. Michael E. Peach obtained his Ph.D. in inorganic chemistry at Cambridge University in England. After postdoctoral work in Germany and a period of service at Dalhousie University, he joined Acadia's Chemistry Department in 1967. Dr. Peach's strong background in main group chemistry marked a turning point for the department, with both the establishment of a far more diverse range of inorganic chemistry courses and a major research program in synthetic inorganic chemistry with emphasis on group 6 (group 16 in the modern periodic table). Since research in synthetic inorganic chemistry was new to the department, he immediately set to work to construct a vacuum system and purchase the dry boxes and other specialized apparatus needed for his work. He obtained excellent funding from NSERC and for many years his research support was the best in the department. This allowed him to quickly establish a large research group of honours and graduate students and, for the first time in the department, he consistently employed postdoctoral fellows. He was instrumental in obtaining a second, more convenient, infrared spectrometer. Also with his initiative, the department was able to obtain funds for its first nmr spectrometer which significantly enhanced research capability in synthetic chemistry. He served the university for a substantial period as Director of Research and Graduate Studies and was Head of the Chemistry Department from 1992 to 1998. He retired at the end of 1999 after 33 years of service to the university.



The decade of the 1960s was one of the more significant ones for Acadia's Chemistry Department. This was catalyzed by the opening of Elliott Hall in 1960 since the greatly improved facilities made it possible to accommodate more students and to expand both the number of faculty and the extent of their research. It was also a period in which chemistry was widely seen as a driver of the economy, producing useful compounds for medicine and agriculture as well as for the manufacture of consumer products. Employment prospects for chemistry graduates had seldom been brighter and government funding for university education and for research had increased very significantly. The decade was also one of historical significance since the department reached its fiftieth anniversary in 1963. Research by honours and graduate students grew significantly, due in part to strong encouragement from the university's new president, Dr. J. M. R. Beveridge, who you will recall was one of the first honours chemistry graduates at Acadia. The construction of the Huggins Science Hall at the end of the decade resulted in a significant spin-off for the Chemistry Department. In return for allowing one of the basement storerooms in Elliott Hall to be used for air conditioning and ventilation equipment for the new building, the Chemistry Department was given funds with which to purchase a liquid nitrogen generator. This avoided the need to bring liquid nitrogen from Halifax for the department's evolving research needs. The installation continued to provide liquid nitrogen for both research and undergraduate labs for the entire university until shortly after the year 2000 when the major repairs needed to keep it working were no longer feasible. Another advantage for the entire faculty of science resulting from the construction of Huggins Science Hall was the provision of a large machine shop, staffed by a machinist. This made it possible for researchers to have mechanical repairs to apparatus made in house. It also made it

possible to build apparatus and instruments in the shop for both teaching and research at much less cost than purchasing them from scientific supply houses. Faculty could design innovative equipment and have it constructed for them, allowing them to spend their time on teaching and research rather than on building equipment themselves. A few years later, an electronics shop was also opened, staffed with an electronics technician. This extended the benefits of the machine shop to electronic equipment. Unfortunately, both shops were closed in the late 1980s as a result of financial pressure on the university.

This decade saw involvement by the department in outreach which was to continue to grow substantially through the following decades. In 1966, the Chemistry Club organized an open house which attracted a large number of people, both old and young, from the community. The chemical magic show was a highlight. This eventually metamorphosed into the faculty of science open house. To this day, the Chemistry Magic Show is possibly the greatest drawing card for these open houses as well as for several other outreach programs operated by the university. With the employment of three new faculty members in 1966 and 1967, the course distribution changed significantly. The third year course in physical chemistry was changed to a one term course in chemical thermodynamics in the second term of second year and the third year course in organic chemistry was also reduced to one term. This made room for a one term course in physical inorganic chemistry (chemical bonding) in the second year and a one term course in main group chemistry in the third year. The course in qualitative analysis was also dropped. The result was a more balanced undergraduate program with improved coverage of bonding theory and inorganic chemistry. The decade saw a substantial increase in external funding for faculty research. The increase in chemical instrumentation during this decade, purchased to a significant degree with these external research funds, had an important effect on undergraduate teaching. Instruments used primarily for research from May through August became available as well for instructional use during the academic year. This provided significant enhancement in the laboratory work associated with the undergraduate courses. This synergy between research and undergraduate course work has continued to strengthen our courses in the subsequent decades, maintaining a modern view of the discipline.



## *Two Decades Of Evolution*

The untimely death of Dr. Cheney in 1970 left the department in urgent need of a replacement. That summer, a tenure track appointment was offered to Dr. John M. Roscoe. Dr. Roscoe had graduated from Acadia with a B.Sc.(Honours) degree in 1965 and a M.Sc. in the fall of 1966. After obtaining his Ph.D. in physical chemistry at McGill and a year of postdoctoral study at the Johns Hopkins University Applied Physics Laboratory, he joined the Chemistry Department in the fall of 1970. His specialty, gas phase chemical kinetics, had provided a good background in both analytical instrumentation and physical chemistry and his first teaching assignment included courses in both of these subjects as well as first year chemistry. Dr. Stiles had just begun the transition to teaching analytical chemistry and before long Dr. Roscoe was teaching all of the physical chemistry courses as well as a section of first year chemistry. To this was eventually added a one term course in physical chemistry in the third year, replacing that removed earlier to accommodate the addition of inorganic chemistry courses. His research area



was new to the department and led to the construction of several vacuum systems and purchase of analytical instrumentation for gas chromatography and optical spectroscopy. Over the years, his work was funded by NSERC, the Canadian Foundation for Climate and Atmospheric Sciences, and Imperial Oil. The university had recently obtained a mainframe computer and he immediately began to develop software for students to use for analysis of their experimental data. As access to computing capability increased, he added computer modeling of reactions to his research. This led to collaborations at other universities and to a significant contract in the petroleum industry. The instructional use of computing was extended to the use of desktop computers for data acquisition in the 1980s. Implementation of the Acadia Advantage Initiative in 1997 provided the opportunity to incorporate use of laptop computers in both the lecture and laboratory components of the department's physical chemistry and first year chemistry courses. He was also involved in outreach, helping to organize the High School Science Seminar for its first ten years and initiating a high school research internship program with local schools. He served as Head of the Chemistry Department from 2002 to 2007 and retired following a sabbatical in 2008 after 38 years at Acadia. However, he continued to do NSERC funded research for several years after he retired.

With the departure of Dr. Robinson from the department in 1971, it became necessary to find someone to teach biochemistry. Dr. Arthur Dick accepted the university's offer and began a long period of service with the Chemistry Department which completely transformed its teaching of biochemistry. Dr. Dick obtained his Ph.D. in carbohydrate chemistry at Queen's University and did postdoctoral work in biochemistry at the National Research Council of Canada, specializing in enzymology. On arrival at Acadia, he faced a significant challenge. The only biochemistry course had for decades been regarded as a service course for premeds and nutrition majors and was seldom taken by students majoring in chemistry. There was little or no modern equipment for the undergraduate biochemistry laboratory and neither laboratory space nor equipment was available for research in biochemistry. The biochemistry teaching lab in the basement of Elliott Hall was immediately converted to a research lab and one of the first year labs on the main floor was used for undergraduate biochemistry. With support from the university, Dr. Dick was able to obtain an equipment grant from the National Research Council for the purchase of an ultracentrifuge. There followed 29 years of productive research in biochemistry, often including collaboration on projects at the Agricultural Research Station in Kentville. His funding was initially from NSERC and the collaboration with Agriculture Canada provided a second source of support. He maintained a substantial research group of honours and graduate students and during a fiscally challenging period in the latter part of the 1980s he was one of only three faculty members in the department who had been able to retain external research support. This success in maintaining a significant level of research funding enabled him to build up an impressive array of instrumentation for biochemical research. The lack of courses in biochemistry was initially a significant obstacle and, as well as modernizing the existing course, he developed additional biochemistry courses that would provide students with an adequate background for further study. These were popular with students majoring in biology as well as those majoring in chemistry. He retired at the end of 1999, having transformed biochemistry from a service course, rarely taken by chemistry majors, to a strong and vital component of the department's offerings.



On the retirement of Dr. Linton in 1975, the department received permission to search for a new head. Dr. Ernest R. Hayes accepted the university's offer and became the first externally appointed Head of the Chemistry Department since Dr. Hill's arrival in 1917. Dr. Hayes graduated from Acadia with a B.Sc.(Honours) degree in 1958 and an engineering certificate in 1959. He obtained his Ph.D. in organic chemistry from McMaster University and did postdoctoral work at the Carnegie Mellon University. After working with Shawinigan Chemicals, he accepted a faculty position at St. Mary's University where he remained until accepting the position as Head of the Chemistry Department at Acadia. Much of his teaching was in the first year and introductory organic chemistry classes where his kindness and patience made him extremely popular with his students. Noting that many of his first year chemistry students had been poorly prepared for a university chemistry course, he developed a non-credit basic chemistry course specifically for students having little or no previous instruction in chemistry. He was also active in outreach, particularly as a judge at science fairs. His research in marine natural products was well supported by the federal Department of Fisheries and his work on extraction of chitosan from shellfish waste led to development of a small company producing fine chemicals from chitosan. He died unexpectedly in 1992 following a short hospitalization having served the university for 17 years.



Although the 1960s were a period of significant growth for Acadia's chemistry department, good things do not last forever and toward the end of the decade chemists began to be viewed in a much less favourable light. Issues such as the thalidomide tragedy and growth of the environmental movement with the publication of Rachel Carson's "Silent Spring" in 1962 pointed to the need for much stricter control of the very medicinal and agricultural substances that had previously been seen as contributions of chemistry to improvements in the quality of life around the world. Chemists became distrusted by the general public to such an extent that the early 1970s were a period of difficulty for chemistry departments everywhere. Acadia was no exception and, during the period 1970 to 1975, the number of chemistry majors declined through a large dip at the bottom of which the number of students graduating in chemistry at Acadia decreased to a very small number. However, enrolment in the department's service courses remained strong as a result of the large number of biology and home economics majors in the first and second year courses. Graduate enrolment in chemistry did not suffer as much as the undergraduate numbers and the latter part of the decade saw a rebound in the number of chemistry undergraduates. External funding for research remained strong during the 1970s and most members of the department had sufficient funds to purchase instrumentation and to employ a significant number of honours and graduate students as well as a few postdoctoral fellows.

During the 1960s, the increase in the department's graduate program and the availability of graduate teaching assistantships had made it possible to employ graduate students to manage the technical duties associated with the large lab sections in freshman chemistry, qualitative and quantitative analysis, and organic chemistry. By the early 1970s, university enrolment was more than double that when Elliott Hall was opened in 1960. This made it necessary to hire technicians to manage the technical preparation for the large labs in first year chemistry and organic chemistry, to take care of ordering the large and diverse quantity of materials for the labs and to manage the stockrooms and the maintenance of the large number of smaller instruments such as balances, colorimeters and pH meters that were increasingly being used in the

undergraduate labs. Three of these technicians in particular stand out for their length and diversity of service to the department.

Mr. Charles Eisnor, known to everyone as Chuck, graduated from Acadia with B.Sc. and B.Ed. degrees. He joined the department in 1976 as the technician responsible for the organic chemistry laboratories. Over the subsequent thirty years, he not only managed the labs but contributed to development of new experiments and tutored large numbers of undergraduates. He also served as a judge at science fairs and helped local high school teachers develop experiments and demonstrations for their students. He was a driving force behind "Acadian Letters", a newsletter provided as a free resource to school teachers. In this publication, Chuck was assisted by students and faculty members, providing enrichment topics, simple experiments, and suggestions for construction of lab apparatus. Acadian Letters was published regularly, several times a year, from 1977 to 1986. Unfortunately, increasing workloads and lack of contributed material from others led it to cease publication in spite of efforts to resurrect it in 1989 and in 1991. Shortly after joining the department, Chuck took an electronics course by correspondence and became the department's unofficial electronics technician. He not only serviced much of the department's electronic equipment, but also built custom designed apparatus for a number of undergraduate experiments. In 1997, Chuck's position was eliminated as a result of financial pressure on the university. However, the need for his services remained. He started a small business making and repairing electronic instrumentation and among his clients was the Acadia Chemistry Department. His departure did not last and he was rehired when the fiscal situation improved. Chuck was an excellent photographer and produced many of the class photos that are found on the walls of the chemistry lounge. He died unexpectedly in 2006.

Mr. Christopher Scott, known to everyone simply as Chris, joined the department in 1982 as the instructor responsible for the first year chemistry labs. Chris had obtained his chemistry degrees in England. The position was for many years only a nine month appointment. However, Chris supplemented his first year lab responsibilities by becoming a regular summer school faculty member presenting both the lecture and laboratory components of freshman chemistry. His personality was an excellent fit for the first year students making the transition from high school to university. He was fair but firm and made the first year labs friendly experiences for his students. With the adoption of the Acadia Advantage, Chris managed the revision of the first year experiments to include data acquisition using the students' laptop computers. This allowed them to display the results of experiments such as calorimetry and pH titrations in real time, avoiding the tedium of manually recording and plotting large amounts of data. Chris retired in 2010 after 28 years of service.

Mrs. Krystyna Palczynski joined the department in 1983, becoming responsible for preparation and supervision of the biochemistry laboratory as well as managing the stockrooms. This included ordering all of the laboratory supplies for the department and negotiating prices with suppliers. The Head of the Chemistry Department had for decades prepared a large order in the spring which was sent out for bids to various suppliers. Krystyna took on responsibility for this activity, often negotiating savings of as much as fifty percent in items on the order. She also frequently helped other departments by adding their requirements to the "big order", allowing them to participate in the saving. As an example of Krystyna's negotiating skill, I recall one

occasion when she discovered that our supplier of compressed gases was charging us more than a local government laboratory was paying. She phoned the supplier asking them to give us the same price as the government lab. The supplier quickly agreed, knowing full well that Krystyna was well aware that their competitor was anxious to get our business! Her skill in managing the ordering was such that she was eventually given full responsibility for the department's accounts, much to the relief of a series of Department Heads. Krystyna's management of the biochemistry lab was at least as good as her management of our lab supplies. She took great pride in having everything well organized and the labs ran like clockwork. She retired in 2011 after 28 years of service.

The decade of the 1970s also saw a major change in academic structure at Acadia. In the early 1970s, a booklet outlining the responsibilities of faculty and the administration was developed. This ultimately led to the first collective agreement between Acadia faculty and the administration in 1979. The precise definition of faculty responsibilities led to significant changes in teaching loads and in the criteria for award of tenure and for promotion. The responsibilities and powers of Department Heads were more clearly defined and the requirements for consulting with faculty and for holding regular departmental meetings also increased. The Chemistry Department developed a well-defined committee structure early in the decade, giving faculty members substantial input for development of departmental policy. This provided a mechanism for distributing the responsibility among faculty members for activities such as curriculum development, safety, and oversight of the increasing amount of general access major instrumentation. Apart from replacement of those retiring, there were no new faculty members hired in the Chemistry Department during the 1970s and 1980s. This was to eventually have a dramatic effect on the demographic of the chemistry faculty once faculty members who had been hired in the 1960s and 1970s retired. The department managed to accommodate the increasing enrolment at the university by making short term faculty appointments during this period.

Unfortunately, the fiscal stress of the 1980s at Acadia carried over to external funding for research. As the decade wore on, the funding available for graduate students decreased to such an extent that there were some years in which no graduate students could be supported. This situation remained until government funding for research improved in the latter half of the 1990s. One positive result of the decrease in faculty research during this period was the development of an industrial research connection. In the early 1990s, Dr. Abbey Kirumira rented research laboratory space in the basement of Elliott Hall for his company, Octopus Diagnostics, which developed low cost medical diagnostic equipment. His company was able to employ Acadia chemistry students, giving them a perspective on applications of chemistry in biotechnology which is unusual in a small university. He also taught in the department from time to time, helping to accommodate the increasing number of students. Acadia Masters student Hermes Chan joined Dr. Kirumira's company and in 1993 they developed a rapid flow-through platform that resulted in a three minute HIV test. Production and marketing of this new technology resulted in the spin-off company MedMira with Hermes Chan as the CEO. In 1999 Abbey's enterprise, renamed BioMedica Diagnostics, moved to larger quarters in Windsor where he still hires Acadia students. In 2007, Dr. Kirumira and Hermes were recognized by *The Economist* for their work. The applications have expanded to a wide range of diagnostic tests,

many of which are useful in the developing world, and the rapid HIV test is the only one to have regulatory approval in Canada, the United States, China, India and the European Union.

By the 1980s, Elliott Hall was showing its age. The roof had a perpetual leak, the plumbing was constantly coming apart, and the lab benches were in an advanced state of wear and tear. The challenging state of the university's finances made it impossible to address these problems until the end of the decade. In 1987, Acadia chemistry alumnus Dr. Kelvin Ogilvie became Vice President. He was concerned by the condition of Elliott Hall, particularly from a safety perspective, and in the summer of 1989 substantial funding was found to make major improvements to the building. Research space was found in Huggins Science Hall and at the Agricultural Research Station in Kentville so that the summer research activity would suffer minimal disruption. The interior of the building was largely torn apart and walls, particularly on the top floor, were rearranged to give better office and classroom space. Before a building permit could be approved, the university had to agree to make the building accessible to persons with restricted mobility. A ramp was constructed to the front door and the vacant elevator shaft finally got its elevator. The leaky roof was replaced and improvements were made to the penthouse to prevent leaks from the distilled water supply from flooding the office directly below. Major improvements were made to the ventilation system, electrical wiring, plumbing and the bench tops and student equipment lockers. The entire renovation cost 2.5 million dollars and, miraculous as it may seem, everything was ready for use by the start of classes in the fall.

### *A Decade of Change*

The decade of the 1990s was in many ways one of change, both positive and negative. It started with a directive from the provincial government to the university presidents to find significant efficiencies in their operations. The government simply did not have the money to fund all the existing programs, at least in part because the formula for federal transfer payments was based on provincial population rather than student population. By 1990 the student population at Acadia had increased to roughly three times the number in 1960 and similar situations were being faced by the other universities. Among the recommendations were amalgamation of all geology and nutrition programs at a single university and reduction of the number of universities offering programs in engineering, teacher training and food science. Decisions were required by the end of 1991 with implementation in 1992. Failure to comply would mean that the Minister of Education would make the necessary decisions. Acadia kept its engineering, nutrition, geology and education programs but lost its young food science program. In an effort to minimize job loss, the technical and faculty positions in the Food Science Department were redistributed as much as possible to other academic units. The Chemistry Department gained an additional technician, Mrs. Juta Cabilio, and an additional faculty member, Dr. Sharon Roscoe. Juta became the technician for the physical and analytical chemistry labs and Dr. Roscoe took on some of the existing physical chemistry courses as well as retaining two of the food science courses. This was necessary initially to ensure that students already in the food science program could get the courses needed for graduation. However, these courses also proved to be popular in their own right, particularly with chemistry and biology students. This brought the department's teaching complement to eight where it would remain except for a brief period after Dr. Ogilvie stepped down as president and entered the department as a teaching faculty member.



Dr. Sharon Roscoe obtained a B.Sc.(Honours) degree at the University of British Columbia and a Ph.D. in physical chemistry at McGill University. While raising a family during the 1970s and 1980s, she taught in Acadia's Chemistry Department on a part time basis to cover for faculty members who were on sabbatical. During 1983-84 she was a visiting professor in the Chemistry Department at the University of Ottawa, teaching and doing research in electrochemistry with Professor Conway, a leading electrochemist. On returning to Acadia, she became involved in contract work for the petroleum industry and used her share of the overhead from these contracts to set up a productive research lab for what was at that time the new field of bioelectrochemistry. In 1989 she was appointed to a tenure track position in Acadia's new Food Science Department. She obtained funding from NSERC, Dairy Farmers of Canada and NS Health Research foundation as well as from CFI. This allowed her to maintain a large research group, usually containing a postdoctoral fellow, and to purchase new instruments for surface characterization. Her work earned her the Clara Benson Award of the Canadian Society for Chemistry. She served a term as President of the Canadian Section of the Electrochemical Society and received the Jacobsen Award of the Electrochemical Society in recognition of her work. Dr. Roscoe was elected National Secretary of the International Society of Electrochemistry (ISE), representing Canada, served as Chair of the Analytical Division of that society. She was elected three times as Secretary General of ISE, the first Canadian to hold a position on the Executive Committee, and was in her third three year term when she was forced to step down due to poor health. She received Honorary Member status, an honour reserved for no more than ten members of the society, in recognition of her work. Dr. Roscoe also served on the Chemistry Grant Selection Committee of NSERC for a number of years, providing the department with direct insight into the way in which the committee applies the criteria for award of grants. Dr. Roscoe taught courses in physical and theoretical chemistry and was Head of Acadia's Chemistry Department from 1998 to 2002. She retired in 2007 but retained her NSERC support and continued to do research for several years after retirement. In 2008 she participated in a successful CFI grant application for \$100,000 to purchase an atomic force microscope for ACMA.



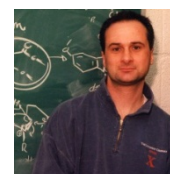
The death of Dr. Hayes in 1992 and the retirement of Dr. Hansen in 1993 began an avalanche of retirements in the department. This was to result in an influx of much younger faculty members and within a decade most of the more senior faculty members would have retired. The fiscal difficulties of the 1980s and 1990s had resulted in a lack of major modern instrumentation. While this did not seriously impact the research of the retiring faculty members, it did affect our ability to attract and retain new faculty. Although we had an old nmr instrument and an even older mass spectrometer, given to us in the early 1970s by the Fisheries Research Laboratory in Halifax, these instruments had by now become obsolete. The mass spectrometer in particular was not "student friendly" and samples had to be run by a faculty member who knew how to "talk to the machine". Neither instrument any longer produced spectra that would be of acceptable quality for publication so we had gradually become accustomed to travelling to Halifax to access the mass spectrometers and nmr spectrometers which were critical for research in chemical synthesis. Our analytical instrumentation was also showing its age. Those applying for faculty positions expected to have modern basic

instrumentation available in house and this placed us at a serious disadvantage when competing for new faculty.

The first of these new faculty members were hired in 1993 to replace Dr. Hayes and Dr. Hansen. Dr. Scott Daniels was an analytical chemist who had obtained his undergraduate education at McMaster University and his Ph.D. at Carleton. He then did postdoctoral work at the University of Ghent in Belgium before joining the department. His specialty was mercury analysis and he set to work to build capability in the department for a variety of approaches to measuring trace levels of mercury in environmental samples. He was an enthusiastic promoter of chemistry in the community and he worked with chemistry students to develop a chemical magic show that could be performed both at Acadia and on the road at high schools. The lack of capacity in the department for a laboratory that could be made clean enough for trace analysis and for instrumentation to make the measurements made it difficult for him to develop a strong research program and he resigned his position in 1998.



The other faculty member to be hired in 1993 was Dr. Michael Kerr. Dr. Kerr obtained his B.Sc.(Honours) degree from the University of Waterloo and his Ph.D. at the University of Hawaii. He then did postdoctoral work at the Scripps Research Institute in California before accepting an appointment at Acadia. His specialty was organic synthesis with particular interest in natural products so his background made him an ideal replacement for Dr. Hansen. He quickly built a large research group with good external funding. His enthusiasm made him an effective teacher and his courses were very popular. However, he felt very constrained by the lack of instrumentation, particularly a modern nmr spectrometer. He resigned from Acadia in 1999 to take a position at the University of Western Ontario where he had more laboratory space and access to a full suite of modern instrumentation to support his research.

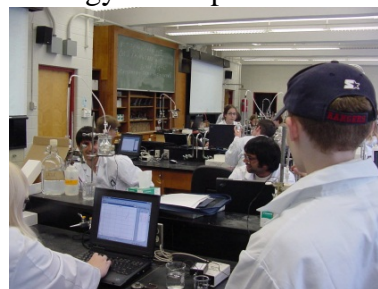


The year 1993 also marked the first issue of our newsletter, *Acadia Chemistry Distillates*. Among other things, it noted the installation of one of our graduates, Dr. Kelvin Ogilvie, as the 13<sup>th</sup> President of Acadia and the presentation of Acadia's Distinguished Service Award to another chemistry alumnus and former President, Dr. J. M. R. Beveridge. It also gave notice of a chemistry reunion to be held August 5 and 6 of 1994 to celebrate the department's 80<sup>th</sup> anniversary. As far as I can recall, we missed the 50<sup>th</sup> and 75<sup>th</sup> so this was the first occasion to recognize our distinguished past. The reunion took the form of a conference in which alumni



representing approximately each decade from the 1940s to the 1980s gave scientific talks, and recalled their careers and the influence their years at Acadia had in their choices. The conference ended with a panel discussion, moderated by Dr. Erik Hansen '49, and a banquet. The photo shows the panelists with Dr. J.M.R. Beveridge '37 standing and, from left to right, Dr. Hansen, Mrs. Elinor (Bourne) Nicol '56, Mrs. Elva (Corkum) Heyge '65, and Dr. Philip Whiting '78.

In 1997, Acadia stepped into the limelight with the introduction of the “Acadia Advantage Initiative”. This was conceived by the university’s president, Dr. Kelvin Ogilvie, as a major step forward in giving our students full access to information technology by arming them with laptop computers. To support this increased computer use, an “intranet” was built with computer connections virtually everywhere. Because each student had the same make and model of computer and was using standardized software, they could use their computers anywhere on campus to study, do assignments or research, and communicate with their professors and other students. Both the hardware and software were supported on campus so students could get their computers repaired and their software problems solved very rapidly. All of this, including the computers, was included in the tuition fees providing a significant income tax advantage. There was also excellent faculty support both for training those who were new to the technology and for developing custom software for teaching. Chemistry was a natural application for this new program and the modest applications of computers developed for our labs in the 1970s and 1980s immediately benefited from this opportunity. During 1997 and 1998, all the chemistry courses were adapted to the use of computer technology. Significant renovations were required to make the classrooms and laboratories fully compatible with the new technology. The picture at the right shows students in the first year chemistry laboratory using their laptop computers for data acquisition in a gas laws experiment. Not only did this extensive use of computers in teaching impress faculty members from other universities who visited us to give seminars, but the presentation skills developed by our chemistry students impressed everyone at the conferences where they presented the results of their research. These skills earned them a large number of awards for their presentations.



In the 1990s the federal government established the Canadian Foundation for Innovation (CFI) in an effort to upgrade the rapidly ageing research infrastructure in Canadian universities. A group of faculty members from biology (Dr. Glenys Gibson), chemistry (Dr. Sharon Roscoe), and physics (Dr. Craig Bennett and Dr. Peter Williams) put together a proposal for a research center containing a suite of instruments for studying materials science. In 1998 their proposal was approved and the Acadia Center for Microstructural Analysis was born. Including matching funds, the grant provided just over 1.3 million dollars. The initial instruments purchased included scanning and transmission electron microscopes, an epifluorescence microscope, and of particular interest to chemists, a scanning tunneling microscope, an atomic force microscope and a state of the art Fourier transform infrared spectrometer equipped for studying surface structure. The center also employed a full time technician to maintain the instruments and to provide instruction in their correct use. This was the first successful CFI application at Acadia and was to be followed up in subsequent years by other CFI grants to chemistry faculty members. The center was to be of particular interest to the chemistry department over the following decade as additional instruments of particular value to chemistry research and teaching were purchased.

In 1997 Dr. Zinck retired but agreed to stay on for one additional year to help with the transition to use of computers in the large first year course. In 1996, the first year course had been split into two courses. The smaller one had a stronger emphasis on numerical problem solving and was intended for students in the physical sciences and engineering. The larger one was intended for students in the biological and health sciences. In 1998, Dr. John Roscoe

converted the smaller course to studio format to make maximum use of computer technology and Dr. Zinck worked on application of the Acadia Advantage to instruction in the larger course. The retirement of Dr. Zinck required a search for someone to replace him and Dr. Jason Clyburne accepted our offer in 1998. Jason had obtained a B.Sc. (Honours) degree from Acadia, working with Dr. Ernest Hayes. He then did his Ph.D. at Dalhousie University and, after short stints at Mount Saint Vincent and Memorial, he spent two years in Texas doing postdoctoral work with Dr. Alan Cowley. Jason's specialty was synthesis and his experience spanned the gamut from main group inorganic chemistry through transition metal chemistry to organic chemistry. He obtained good funding from NSERC and established an active research group. However, the lack of facilities for his work was an impediment and he resigned in 2001 to take a faculty position at Simon Fraser University.

By 1999 we were still short one faculty member as a result of the resignation of Dr. Daniels. That year, Dr. Robert Gossage accepted our offer of an appointment. Dr. Gossage obtained a B.Sc.(Honours) degree at the University of Guelph and a Ph.D. from the University of Victoria. After postdoctoral study at the University of Utrecht in the Netherlands, he spent a brief time in industry working for AnorMED in British Columbia before coming to Acadia. Dr. Gossage's specialty was inorganic synthesis with a background in synthesis of silicon-based dendrimer catalysts. He developed a strong research program at Acadia with a focus on synthesis of compounds for cancer therapy. He obtained research funding from the Research Corporation in the United States and from the Canadian Breast Cancer Foundation as well as from NSERC. His teaching included first year chemistry, which by now had grown to four sections including the course for chemistry majors, and several inorganic chemistry courses. He resigned in 2008 to take a faculty position at Ryerson University.



### *A New Millennium*

The new millennium began with the retirement of both Dr. Peach and Dr. Dick at the end of 1999. It also provided an opportunity to recognize one of Acadia's first three faculty members. When Elliott Hall was renovated in 1989, the undergraduate analytical chemistry lab on the main floor had been dedicated to Dr. Hill and the undergraduate organic chemistry labs on the top floor had been dedicated to Dr. Small. Now in 2000, the physical chemistry lab on the top floor was dedicated to Dr. Linton, in recognition of his development of the physical chemistry courses during his long career at Acadia. The picture at the right shows Dr. Linton with the plaque recognizing his contribution. The plaque is now mounted near the front door of Elliott Hall beside his photograph, together with the photographs and plaques honoring Dr. Hill and Dr. Small.



The millennium started with a search for three faculty members. This was required by the resignation of Dr. Kerr and the retirements of Dr. Peach and Dr. Dick. Across Canada, the faculty members who were hired in the expansion years of the 1960s had reached retirement age and the resulting employment opportunities resulted in a high level of mobility as faculty members sought "greener pastures". Dr. Jeffrey Banks was the replacement for Dr. Kerr. He obtained his undergraduate education at the University of Prince Edward Island and his Ph.D. at

the University of Ottawa. Following postdoctoral work at the National Research Council in Ottawa, he spent several years as a faculty member at Lakehead University before accepting our offer in 2000. Dr. Banks was a physical organic chemist with a background in photochemistry. While at Lakehead, he had begun to collaborate with colleagues in the Physics Department who needed someone to make the organosulfur compounds they needed for their studies of surface adsorption on gold. This expanded his research interests to the study of self-assembly of monolayers using atomic force microscopy. The instrumentation available in the Acadia Center for Microstructural Analysis was ideal for his new research interest and he became involved in collaboration with faculty members in Acadia's Physics Department. He had good funding from NSERC which allowed him to quickly establish a research group. Having done his undergraduate work at a primarily undergraduate university, he had an excellent understanding of the educational environment at Acadia. His teaching included courses in organic chemistry as well as first year chemistry. In 2003 he accepted an offer of a faculty position at the University of New Brunswick. However, in 2008 he returned to Acadia to accept the position of Head of the Chemistry Department. In 2011 he accepted the position of Acting Director of Open Acadia, the unit that manages the university's extension programs. In 2012 he was appointed to a regular term as Director of Open Acadia, but retained an affiliation with the Chemistry Department.



Our second faculty appointment in 2000 was Dr. Katherine Hamilton who replaced Dr. Dick. She completed her undergraduate work at Bishop's University and then obtained her Ph.D. from the University of Alberta. She did postdoctoral work at the University of Western Ontario before coming to Acadia. Her research interests were in studying protein structure using nmr spectroscopy. She retained her connections with the University of Alberta and the University of Western Ontario so that she could use their high field nmr instruments. At that time, there were no high field nmr instruments in Atlantic Canada and these were essential for her research. In 2003 she left Acadia to take a position at the University of Saskatchewan.

Dr. Hua-Zhong (Hogan) Yu was the third new faculty member hired in 2000, replacing Dr. Peach. He did his undergraduate work at Shandong University in China and obtained his Ph.D. from Peking University. He then did postdoctoral work at the California Institute of Technology working with Nobel Laureate Professor Ahmed Zewail and then worked at the National Research Council in Ottawa before coming to Acadia. Hogan's research area was surface science and his background was with silicon surfaces. The obvious applications to semiconductors made this research highly fundable and he quickly built a research program based on the equipment in the Acadia Centre for Microstructural Analysis. In 2001 he left Acadia to take a faculty position at Simon Fraser University.

The resignations of Jason Clyburne and Hogan Yu in 2001 made it necessary to search for two faculty members to replace them. In 2002, the department advertised for a synthetic organic chemist and an analytical chemist. One of the deficiencies in the department which had contributed significantly to our ability to attract and retain faculty members with research in organic synthesis was the lack of a modern nmr spectrometer. In 2001, the university agreed to purchase a new 300 MHz nmr spectrometer. The



instrument was installed in the Acadia Centre for Microstructural Analysis in 2002 so that the ACMA technician could manage the maintenance of the instrument and supervise its use. The search was successful and both faculty members who were hired are still with the department at this writing.

Dr. Amitabh Jha received his Ph.D. in organic chemistry from the University of Delhi. He did postdoctoral work and taught in the College of Pharmacy at the University of Saskatchewan. Following a short period in industry with Alviva Biopharmaceuticals in Saskatoon he accepted our offer of appointment in 2002. His specialty was medicinal chemistry with a particular interest in synthesis of new drugs for treating cancer. This proved to be a popular field with our students and he built an active research group with funding from NSERC and a number of health related funding agencies including the Canadian Breast Cancer Foundation and the Nova Scotia Health Sciences Foundation. He also employed postdoctoral fellows on a regular basis. He maintained collaborations with researchers in other institutions who were able to assist by screening his compounds for anticancer activity. Dr. Jha served as Acting Head of Chemistry in 2008, managing the external search for a new Head for the department. In 2011 he was again pressed into service as Acting Head when Dr. Banks was appointed Acting Director of Open Acadia. The university revived the practice of awarding endowed chairs and he was appointed to a five year term as the George H. Wallace Chair in Chemistry.



Also in 2002, Dr. Vlad Zamlynyy accepted our offer of appointment, replacing Hogan Yu. Vlad received his undergraduate education at the National Taras Shevchenko University of Kiyv and then came to Canada to do his Ph.D. in analytical chemistry at the University of Guelph where he specialized in spectroelectrochemistry. His teaching in the department has included courses in analytical chemistry and first year chemistry. Dr. Zamlynyy's research interests lay in studying ultrathin films and their industrial and environmental applications. The facilities for studying surface structure in the Acadia Centre for Microstructure Analysis were an advantage for his work and he used his initial NSERC funding to start building a research program using a combination of electrochemical and spectroscopic techniques. While at the University of Guelph, Dr. Zamlynyy was responsible for developing the first adaptation of polarization modulation infrared absorption spectroscopy (PMIRAS) to electrochemical surface science. In 2004, he was successful in obtaining a CFI grant of \$377,000 to purchase equipment for establishing PMIRAS as one of the tools available in ACMA. His expertise has been recognized by invitations to visit Russia and Argentina as well as Canadian universities to help others set up this technique in their labs.



With the retirement of Dr. Stiles in 2003, it became necessary to find someone with a background in environmental analytical chemistry to teach his courses in the Environmental Chemistry Program. Dr. John Murimboh accepted our offer in 2004. Dr. Murimboh did his undergraduate work at McMaster University and obtained his Ph.D. from Carleton University, specializing in biogeochemistry. He did postdoctoral work at the University of Ottawa before coming to Acadia. Dr. Murimboh was impressed by the combination of studio



instruction and the extensive use of laptop computers in the section of first year chemistry for chemistry majors. He soon took on the teaching of this course, in addition to his courses in environmental analytical chemistry. His research was also novel in the department for its significant involvement in field work and he had no difficulty in attracting students as he built his research program. In 2006, he was awarded a CFI grant of \$356,000 for the purchase of an inductively coupled plasma mass spectrometer. Since this instrument was to be used for research in environmental analytical chemistry, it was appropriately located in the K. C. Irving Environmental Research Centre where Dr. Murimboh had a research lab. In 2012, he accepted an appointment as Head of the Chemistry Department, replacing Dr. Banks who had been appointed Director of Open Acadia.

In 2002, Dr. Katherine Hamilton resigned to take a faculty position at the University of Saskatchewan. In 2003, Dr. Banks also resigned to take a faculty position at the University of New Brunswick where he would remain until he returned to Acadia in 2008 as Head of the Chemistry Department. This necessitated a search for a biochemist and a physical organic chemist. Dr. Rita Mihailescu accepted our offer of the biochemistry faculty position but resigned a year later necessitating another search. However, we were more fortunate in our search for an organic chemist and in our subsequent search for a biochemist.

Dr. Matthew Lukeman accepted our offer of an appointment in 2005. Dr. Lukeman received a B.Sc.(Honours) degree at Saint Francis Xavier University and obtained his Ph.D. in physical organic chemistry at the University of Victoria, specializing in organic photochemistry. He did postdoctoral work at the University of Ottawa before coming to Acadia. Dr. Lukeman's background made him an ideal replacement for Dr. Banks and he proved to be an excellent and very popular teacher. His courses in organic chemistry and first year chemistry always received enthusiastic reviews from the students. Like Dr. Banks, he had obtained his undergraduate education at a university whose character was very similar to that at Acadia and he understood the nature of the student body and of the place of research in this environment. He quickly built an active research group including both undergraduate and graduate students with good funding from NSERC. In addition to operating grants from NSERC, in 2006, he received an equipment grant of \$61,000 for a laser flash photolysis system and, in collaboration with Dr. Gossage, Dr. Jha and Dr. Murimboh, shared in an equipment grant of \$134,000 for a research HPLC instrument. In 2007 he was successful in a CFI application for equipment valued at \$320,000 to provide additional equipment and renovations in support of his photochemical research. This made him the fourth chemistry faculty member to receive CFI funding.



Following the failed search in 2005 for a biochemist to replace Dr. Mihailescu, Dr. Sherri McFarland accepted our offer and joined the department in 2006. Dr. McFarland obtained her undergraduate education at Hendrix College in the United States and did her Ph.D. at the University of California in San Diego. She then did postdoctoral work at Dalhousie University before coming to Acadia. Like Dr. Banks and Dr. Lukeman, her background at Hendrix, a small university with a strong focus on quality undergraduate teaching, served her well in her new job at Acadia. Her research interest in photodynamic therapy provided her with a wide range of expertise in photochemistry, inorganic photophysics and spectroscopy. She proved to be an effective teacher



and her research was popular with both undergraduates and graduate students. She was able to obtain strong external funding for the laser and spectroscopy equipment that is essential for her research. Her CFI grant for \$370,000 was the fifth one awarded in our department and allowed her to purchase a femtosecond laser system for her research. In addition to maintaining her NSERC operating grant, an increasingly difficult task particularly for younger faculty members, she has funding for a Collaborative Health Research Project and was awarded a contract valued at \$178,000 per year with a company that manufactures laser equipment for medical applications.

Following completion of his service as President in 2003, Dr. Kelvin Ogilvie took an administrative leave before formally entering the Chemistry Department as a teaching faculty member in 2005. He had spent some of his leave developing a new course based on a very successful one for non-specialists at McGill. The department submitted a course proposal for this course which was eventually approved by Senate in January of 2006. He presented *Chemistry and Our World* for the first time in the 2006-2007 academic year. The course endeavored to provide the scientific basis for a number of current societal issues and was intended to be accessible to students outside the Faculty of Science. It was an instant success and continued to be offered after Dr. Ogilvie retired in 2008. With a ninth member of faculty, it became possible to redistribute the teaching loads in a manner that provided junior faculty with a better opportunity to build their careers. Dr. Ogilvie carried a full teaching load with a greater than average proportion of laboratory supervision. He was very effective in this role and the students appreciated having a former University President and internationally renowned expert in biotechnology in the lab with them. In spite of having demonstrated the need for a ninth faculty member, an emerging new set of fiscal problems at Acadia led to denial of our request for a replacement for Dr. Ogilvie on his retirement.



The retirement of Dr. Sharon Roscoe in 2007 meant that once again a search for a new faculty member was required. We applied proactively to search for her replacement and in 2007 Dr. Anthony Tong accepted our offer. Dr. Tong received his undergraduate education at the University of Science and Technology of China. He then came to Canada obtaining his Ph.D. in physical chemistry at Queen's University. He did postdoctoral work in analytical chemistry at the University of Waterloo and then worked as an analytical chemist with ALS Laboratories Group and with Environment Canada. Dr. Tong's research interest is in the application of physical chemistry to develop new analytical instrumentation. While at Queen's, he was responsible for production of the first fiber optic cavity ring down system. He obtained external funding from NSERC and from several industrial partners and built a successful research program. As part of this funding, he received a CFI grant of \$300,000 for purchase of GC/MS and a HPLC/MS instruments to support his research. This would be the last CFI grant available to the university since the funding was by now exhausted. The students in his research group came both from Acadia and from other universities. His strong background in physical chemistry, physics and mathematics made the transition to teaching physical chemistry very smooth and effective.



The unexpected resignation of Dr. Gossage in 2008 required a search for someone to teach inorganic chemistry. In 2009, Dr. Bobby Ellis accepted our offer and joined the



department. Dr. Ellis obtained a B.Sc.(Honours) degree from Dalhousie University and a Ph.D. degree in synthetic inorganic chemistry from the University of Windsor. He then did postdoctoral work at the University of California at Davis. His background provided a smooth fit to the courses that had been taught by Dr. Gossage and his personality made him immediately popular with his students. Dr. Ellis quickly began a productive research program with a focus on understanding unusual bond types in main group elements and studying activation of small molecules by main group elements. His research is funded by NSERC, an increasingly difficult proposition in the second decade of the new millennium as a result of severe underfunding of NSERC by the federal government. His research has significant industrial application in the energy sector as a source of catalysts for production of hydrogen.



The loss of our technicians Juta Cabilio, Chuck Eisnor, and Krystyna Palczynski and our first year lab instructor, Chris Scott, within the space of a few years left the department in a difficult position in a period of financial difficulty for the university. Fortunately, the administration understood our difficulty and we were eventually able to obtain replacements for all these positions. Dr. Elena Zamlynny joined the department in 2008 replacing Juta Cabilio in the analytical and physical chemistry labs. She obtained her Ph.D. from the Russian Academy of Sciences in Moscow. Also in 2008, Dr. David Magri was hired as the instructor for the organic chemistry laboratories, replacing Chuck Eisnor. In 2010 he resigned to take a faculty position at the University of Malta. In 2012 Teri Gullon joined the department as Dr. Magri's replacement. She obtained her B.Sc.(Honours) degree from Mount Allison University and her M.Sc. from McMaster University. Following the retirement of Chris Scott in 2010 Ashley Parsons joined the department as the first year laboratory instructor. She obtained her B.Sc.(Honours) degree from Cape Breton University and her M.Sc. from Dalhousie University. With the retirement of Krystyna Palczynski in 2012, Aimée Adams joined the department as the technician for biochemistry and inorganic chemistry. Aimée obtained her B.Sc. from Acadia with a double major in biology and chemistry and her M.Sc. in medicine from Memorial University. She resigned her position in 2013. As of this writing, all our faculty and staff positions are occupied and there are no resignations on the horizon. With a bit of luck and hard work, the department will have entered a new period of stability as we begin the second decade of the 21<sup>st</sup> century and begin the second century of the life of Acadia's Chemistry Department.

## *Epilogue*

As one looks back over the Chemistry Department's first hundred years, there are two constants. First, the fiscal situation at Acadia seems to have been in a nearly constant state of difficulty. As Dr. Ernest Hayes used to say, Acadia's only crime is not having been called Saint Acadia! Second, despite these financial pressures, the Chemistry Department has maintained an academically solid program which has produced a steady stream of exceptional graduates. This is largely due to the persistence and dedication of the faculty members, particularly those in the first half century who laid the foundations of the current department. Among these graduates, a few deserve special mention.

In a letter to the Hon. J. L. Illsley, Chief Justice of Nova Scotia, who participated in the opening ceremonies for Elliott Hall in 1960, Dr. Hill identified a few graduates who he felt were outstanding.

Dr. John Seaman Bates obtained a B.A. from Acadia in 1908, a B.Sc. from Acadia in 1909, a chemical engineering degree from Columbia University in 1913, and a Ph.D. from Columbia in 1914. In 1940, Acadia conferred on him a D.Sc. in recognition of his outstanding career as a leader in the Canadian pulp and paper industry.

Dr. Francis M. Archibald obtained a B.Sc. from Acadia in 1919, a B.Sc. in chemical engineering from McGill in 1923, and a M.Sc. from the University of Toronto in 1926 followed by a Ph.D. in 1928. In 1960, Acadia conferred on him a D.Sc. degree in recognition of his distinguished career in the oil industry in both Canada and the United States.

Dr. Charles Alexander Escoffery obtained his B.Sc.(Honours) from Acadia in 1937 followed by a Ph.D. from the Massachusetts Institute of Technology. He held senior positions with the Federal Telephone and Radio Corporation, International Rectifier Corporation, and Hughes Aircraft Corporation. In 1970 Acadia conferred on him a D.Sc. degree.

Dr. I. Maxwell Robinson graduated from Acadia with a B.Sc. in 1940 and B.Sc.(Honours) in chemistry and mathematics in 1941. He obtained a M.Sc. in organic chemistry from the University of Toronto and a Ph.D. from Purdue University in 1949. He spent his career with the Dupont Corporation where his discoveries of polymers including Vespel, Kapton, Tyvek, Typar, Lycra and high density polypropylene provided enormous benefit to society. In 2005 Acadia awarded him a D.Sc. degree.

Dr. Claude T. Bishop obtained his B.Sc. from Acadia in 1945, his B.A. in 1946, and his Ph.D. from McGill in 1949. He spent his career at the National Research Council in Ottawa, rising to the rank of Secretary General and serving as editor of the research journals of the National Research Council.

Dr. Cynthia Mary Trudell obtained her B.Sc. from Acadia in 1974 and then graduated from the University of Windsor with a Ph.D. She has spent her career in industry, where she held positions as President of the Saturn Motor Company, CEO of the Sea Ray Group, and is currently Senior Vice-President of Pepsico. She holds D.Sc. degrees from Acadia, the University of New Brunswick, Ryerson University and the University of Windsor.

Mr. Hermes Chan graduated with a B.Sc. in 1988 and a M.Sc. in 1990. He joined Octopus Diagnostics and in 1993 invented the rapid flow-through diagnostic platform which resulted in the first rapid diagnostic method for HIV. He became CEO of MedMira, a company established to develop and manufacture this and other rapid diagnostic tests, which now has an international market and operates laboratory and manufacturing facilities in Halifax and the Maple Biosciences company in Toronto. He was recognized as Top Bioscience Innovator of 2007 by *The Economist*.

Dr. Charles B. Huggins graduated from Acadia in 1920 with a B.A. degree. Although the Acadia alumni directories do not indicate his major, one of his physical chemistry lab reports hangs on the wall of the office of the Head of the Chemistry Department. This suggests that he took a number of chemistry courses comparable to those taken by a chemistry major at that time. He then obtained a M.D. from Harvard and a M.Sc. from Yale. He was founder and director of the Ben May Laboratory for Cancer Research at the University of Chicago and served as Chancellor of Acadia. He shared the Nobel



Prize in Medicine and Physiology in 1966 and received D.Sc. degrees from Acadia, the Universities of Washington, Leeds and Torino, and an LL.D. from the University of Aberdeen.

The department has also produced at least three university presidents.

Dr. J. M. R. Beveridge obtained his B.Sc.(Honours) from Acadia in 1937, a Ph.D. in biochemistry from the University of Toronto and his M.D. from the University of Western Ontario. He was Head of the Biochemistry Department and Dean of Graduate Studies at Queen's University before coming to Acadia in 1964 as its tenth President. He was granted D.Sc. degrees by Acadia and Queen's and a LL.D. by Mount Allison University and was made an officer of the Order of Canada.



Dr. Arthur N. Bourns obtained his B.Sc.(Honours) from Acadia in 1941 followed by a Ph.D. from McGill. He joined the Chemistry Department at McMaster University in 1947 where he served for 35 years holding the positions of Dean of Graduate Studies, Head of the Chemistry Department, Vice-President, Science and Engineering, and President. He also chaired the international committee to advise the Chinese government on development of its universities and served on numerous committees of the National Research Council of Canada. He was granted D.Sc. degrees by Acadia, the University of Manitoba, McGill University and McMaster University and an L.L.D. degree by Brock University and was admitted to the Order of Canada.



Dr. Kelvin K. Ogilvie graduated from Acadia in 1963 with a B.Sc.(Honours) degree and obtained his Ph.D. from Northwestern University. He taught at the University of Manitoba and McGill University before coming to Acadia in 1987 as Vice-President. He served as Acadia's 13<sup>th</sup> President from 1993 until 2003. While at McGill, he was responsible for invention of the "gene machine" which made possible the automatic synthesis of DNA and for synthesis of the antiviral drug Ganciclovir which was used throughout the world to combat AIDS. He also invented a general method for synthesis of RNA which is still the basis for RNA synthesis throughout the world. At Acadia he was responsible for introduction of the Acadia Advantage Initiative which made Acadia the first computer intensive university campus in Canada. He has also served on a large number of government advisory boards. Dr. Ogilvie was appointed to the Senate of Canada after he retired. He was awarded D.Sc. degrees by Acadia, the University of New Brunswick and McGill University and was admitted to the Order of Canada. He received the Manning Principal Award and was inducted into the Canadian Science and Engineering Hall of Fame. He holds 14 primary patents based on his discoveries.



Until 1968, Acadia's Chemistry Department was in a growth phase although at times the growth was relatively slow. The decade of the 1960s was one of rapid growth both at Acadia and across Canada. This was presumably due to a significant extent to the decision by provincial governments to provide substantial funding to universities, marking their transition from private to public institutions. This made tuition fees more manageable and encouraged more students to seek a university education. Growth in enrolment at Canadian universities continued after 1970 but this was not accompanied by a corresponding growth in the number of faculty members or in the size of government grants. As a result, the number of faculty members in Acadia's Chemistry Department remained constant with the only faculty searches resulting from the

occasional retirement or resignation. After about 1990, the faculty members hired in the 1960s reached retirement age and all across Canada there was a flurry of faculty searches. This made it difficult for Acadia to compete for faculty members with larger or better funded universities and those new faculty members who did accept our offers frequently stayed at Acadia for only a few years before leaving for greener pastures. By about 2010, most of these retiring faculty members had been replaced and across Canada there were very few opportunities for faculty positions. It seems likely that the next hiring boom will not occur until roughly 2030. Unless there are dramatic changes in funding or enrolments, we should be entering a lengthy period of stability.

One of the more impressive occurrences of the past three decades has been the increase in instrumentation required for modern chemistry. Elliott Hall was certainly not designed with this in mind. In 1960, very little instrumentation was in use at Acadia and even the large, research oriented universities had far fewer and much less complex instruments than is currently the case. Elliott Hall, by itself, does not have sufficient space for this infrastructure or for the increased emphasis on research imposed by collective agreements. To some extent, this has been addressed by borrowing laboratory space from Huggins Science Hall and from the K. C. Irving Environmental Science Centre but this has been at the expense of cohesiveness as faculty members become more widely dispersed on campus. The time is approaching when replacement of the 53 year old Elliott Hall needs to be considered. In spite of renovations, the ventilation system cannot be expanded further and there are still labs where air exchange and fume hood access are not adequate. The storage of chemicals needs to be improved and space needs to be provided so that graduate and honours students and technicians do not have to use their laboratories for offices. The building is now also operating at or beyond its capacity for undergraduate labs as a result of steadily increasing enrolments in the first and second year service courses. Elliott Hall is now one of the oldest chemistry buildings in Atlantic Canada and this places us at a disadvantage in attracting undergraduate students. The department has been able to keep up with the advances in instrumentation largely as a result of successful applications for grant support from agencies such as NSERC and the Canada Foundation for Innovation. Our faculty members have been particularly successful with CFI having brought in just over three million dollars in seven grants for equipment. These instruments are used for undergraduate teaching as well as for research so it is critical that the current faculty members are provided with a workload that allows sufficient time for research supervision, attendance at international and national conferences, and writing publications. This is needed for success in securing the external funding that drives the synergy between undergraduate education and research. For the brief period when Dr. Ogilvie was teaching in the department, the presence of a ninth faculty member had a beneficial effect. The decision not to replace him on his retirement and the loss of Dr. Banks to Open Acadia without a replacement has made the workload significantly more difficult. It is no accident that decreased faculty success in obtaining research funding has accompanied these decisions.

While challenges remain, Acadia's Chemistry Department has faced and overcome more serious ones over its first century. Problem solving is where chemists excel and this is evident from the careers of the representative graduates in my short list. With continued hard work and determination, the second century can be at least as successful as the first.