Nutritional Sciences at the University of Guelph 1938 to 1995

Nutritional Science at Guelph (written by H. Bayley)

The study of nutrition at Guelph has changed as the science has evolved. In the early decades of the twentieth century there was the excitement of the discovery of the vitamins, complex and varied organic molecules which played a vital role in life. In the last decade there has been renewed excitement as "nutraceuticals" are being recognized through their putative roles in health. In between there have been several eras where the roles of food in the body's function have been elucidated. The progress through these eras has always been made possible by advances in the chemical laboratory. Guelph has always been fortunate to have the equipment and faculty to be an international leader in the development of Nutritional Science.

The Department of Nutrition grew out of Poultry Science early in the 20th century to describe foods on the basis of chemical composition, it changed to Nutritional Sciences, and then merged with Human Biology. The focus was always the application of current science to best use food.

In the 'twenties the Poultry Science Department received funding from the empire egg Marketing Board to promote egg consumption. Dr Hugh Branion was instrumental in forming the Department of Nutrition within the Ontario Agricultural College to define the nutritional values of foods using chemical and biological assays. There were chemical laboratories and animal house facilities. Proximate analyses of foods to determine the moisture, ash, fat, crude protein and crude fibre were the main activities. Foods were compared by conducting growth assays using rats, chicks and guinea pigs. The vitamins were being discovered and the relative potencies of different foods were compared using microbial bioassays.

The development of the program was delayed by the second world war, and Dr Branion used his nutritional expertise with distinction to alleviate the suffering in war ravaged Europe, his contribution to the Netherlands being particularly noteworthy.

After the war ended there was great interest in nutrition and great efforts were being expended worldwide to reduce malnutrition through a better understanding of the nutritional value of food resources. This was led by FAO (Food and Agriculture Organization of the United Nations).

Protein was a major focus of this effort and the recognition that differences in amino acid profiles of proteins explained their different nutritional values gave great impetus to the comparisons of protein rich foods. Work in Guelph using both animal-based bioassays, and chemical based amino acid analyses aided the development of more effective diets using common foodstuffs. Dr Doug Hill played a major role in this pioneering work.

Cattle production in some parts of Eastern Ontario suffered because the animals failed to thrive. It was discovered that this was due to mineral inadequacies in the soils, and after extensive analyses of the soils and forages it was determined that copper deficiency was the problem. The development of mineral supplements raised the productivity to more general levels. David Arthur's analytical expertise played a major role in this success.

A common problem with poultry production was the provision of adequate amounts of utilizable phosphate in the diets. This was in spite of the presence of phosphate in most foods. The problem was one of utilizability: plant phosphorous was not utilized, but mineral supplements were. Dr Iliary Motzok devoted his career to studying the enzymic processes necessary for food phosphate to be useful to the body.

The arrival of the ‘sixties, brought massive investment by the Province in Universities. The University of Guelph was formed by the amalgamation of the Ontario Agricultural College, the Ontario Veterinary College, Macdonald Institute, and Wellington College. Many new buildings were added to allow the campus to accommodate the then planned 15,000 students. The Department of Nutritional Science and the Department of Animal and Poultry Science designed and built the current facilities. Interestingly the origins of the computer science services were in the Department of Animal and Poultry Science where the powers of electronic data analyses were being used to promote understanding of the breeding of better livestock and the University hardware is still located in the building. The Department was under the direction of Dr Stan Slinger who developed expertise to compare feeds based on their energy supplying power to the body.

As the new building increased the physical space, new faculty were brought into the Department. Dr Brian Walker brought his expertise in fat analyses to better understand the nutritional role of this diet constituent. Dr Henry Bayley and Dr Tom Neudorffer were brought into the Department to extend the studies of food digestion and utilization from rats and chicks to pigs and cattle. Dr Craig Alexander, a successful food industry research scientist, brought in his experience to the design of the new facilities. The building opened in 1967 and allowed a vastly expanded teaching and research program. An undergraduate specialization in nutritional science was introduced, with many new courses which examined the role of the nutrient classes in the body. The graduate program expanded and attracted young scientists from around the world.

In this era, the newer techniques of analysis allowed foods to be defined in more meaningful ways than had been possible using the classical proximate components analyses. Gas-liquid chromatography could characterize fats on the basis of their individual fatty acids, ion exchange and later, high pressure liquid chromatography allowed proteins to be characterized on their amino acid compositions, and atomic absorption spectrophotometry made it possible to quantify minute traces of individual mineral elements. These developments in the characterization of the foods were accompanied by animal experiments which showed how the chemicals within the foods were digested and absorbed and how these compounds and elements influenced the health, growth and behaviour of the animals.

The seventies saw the creation of the College of Biological Science to pursue biology in a broader context than agriculture. Dr Slinger introduced the study of the nutrition of fish to the species being considered and taught a course on Fish and Wildlife Nutrition. Dr Cho developed the Guelph Fish Nutrition Laboratory. Dr Bray was appointed and brought the recognition that foods were sources of toxicants as well as nutrients with her research program. She introduced a course “Toxicological Aspects of Nutrition”

Dr Harold Draper became chairman of the Department in 1975. This decade saw the retirements of the founding members of the Department and they were replaced by Drs Chavez, Bettger, Hilton, Smith, and Woodward. These faculty introduced programs to investigate broader biological attributes of food. Dr Chavez studied the roles of selenium in the body, Dr Bettger investigated the physiological and pharmacological effects of trace minerals and essential fatty acids. Dr Hilton continued to show the roles of individual nutrients for fish. Dr Smith showed that small amounts of materials (contaminants?) in some foods controlled and modified growth and development. Dr Woodward developed a new program to show the relationship between nutritional status and immune function.

There was a huge increase in the numbers of undergraduate students in nutrition courses with several hundred enrolled in “Fundamentals of Nutrition”. This course was required for students in many biological and agricultural degree programs. Dr Jim Atkinson had a major role in providing students with an understanding of the importance of diet on the growth and health of laboratory animals.

Dr Bayley became chairman in 1986. This was the era of genomics and the expectation that a better understanding of the role of nutrients in gene expression would give insight to health and development. Drs Glanville, Kirkland, Meckling, and Nagy joined the Department and used isolated cells in culture to examine specific nutrient and toxicant effects. Dr Kirkland reexamined the role of niacin in healthy and diseased (cancerous) cells, and Dr Nagy investigated the metabolism and toxicity of alcohol. Students in the honours degree program were encouraged to carry through a research project to give them an in depth view of the role of nutrients on body function in health and disease.

The Department’s interests became increasingly focussed on the effects of diet on human health: “Health Promotion and Disease Prevention” became a theme for both research and teaching. Budget constraints created a need within the University for consolidation and focus. The Department of Nutritional Science and the Department of Human Biology recognized that they shared a common goal: human health. They merged to explore the synergies between diet, exercise, and lifestyle in 1995.

Department of Human Biology and Nutritional Sciences

The First 10 Years (written by J. Barclay)

On April 17, 1995, the Department of Human Biology and Nutritional Sciences (HBNS) was created when the Senate of the University of Guelph approved the merger of two academic units in the College of Biological Science (CBS) - the Department of Nutritional Sciences and the School of Human Biology. This was the culmination of 18 months of extensive discussion and planning by those involved. The teaching, research, and service activities of the new Department, representing the common elements in the philosophies of the two parental units, focused on advancing the basic science foundation underpinning the importance of lifestyle in health and freedom from disease.

Over its first 6 years, HBNS consolidated in the space previously occupied by Nutritional Sciences in the Animal Nutrition Building. This move allowed the faculty to take advantage of the superior laboratory facilities in that building. Academically, this period was a time of integration of research interests and the resulting expansion of work in the area of metabolism. At the undergraduate level, the three BSc majors in Bio-Medical Science, Human Kinetics, and Nutritional Sciences which evolved into Nutritional and Nutraceutical Sciences continued to grow in reputation and student numbers. As many of the traditions of the founding departments as possible were integrated into the new department. These included all undergraduate and graduate awards, the undergraduate student symposium, and the Grad Bash. At the graduate level, enrolment continued strong in both thesis and course work and research project MSc programs and the PhD program. Following the appraisal in the late 1990's, these graduate programs which were originally associated with Nutritional Sciences became available to all faculty in HBNS. To facilitate this move, the MSc program in Human Kinetics was voluntarily closed down.

This period also marked the opening of the Health and Performance Center, a collaborative effort with the Department of Athletics and Student Health Services in the J. T. Powell Building. Cyndy McLean was the first Director. The Human Nutraceutical Research Unit was added to the Center several years late with Julie Conquer as the Director. These two initiatives provided opportunities for teaching and research for faculty and opportunities for students to gain experience in a professional clinic whose goal was serving the community. A joint program in Sports Injury Management was also created in collaboration with Sheridan College in order to provide another career option for Human Kinetics majors.

As would be expected, there was significant faculty turnover during the first 6 years after the merger. Both Drs. Stan Blecher and John Brooke retired while Drs. Tammy Bray, Laura Nagy, Susan Pfeiffer, and Jim Potvin left to pursue their careers in other locales. During this period at the University, HBNS was very lucky to be allowed to fill its vacant faculty positions. To replace them with talented people such as Drs. Marica Bakovic, Jack Callaghan, Jim Dickey, Allison Duncan, Dave Dyck, and Coral Murrant was an added bonus that allowed the Department to accelerate its development.

Dr. Terry E. Graham replaced Jack K. Barclay as Chair of HBNS in the late summer of 2001.

The Historical Background of HBNS

As with all human endeavor, the Department in its present form is built upon the foundation of the two founding departments. Each of them had a long and often eventful history on the University of Guelph campus.

Human Biology at the University of Guelph 1966 to 1995

The roots of the School of Human Biology were in the School of Physical Education which was formed in 1966 from the existing Departments of Physical Education and of Athletics. The first graduating class from the new and unique science based undergraduate physical education degree program developed by the School of Physical Education received their degrees in 1971. Students in that class organized and ran the first undergraduate symposium. As mentioned earlier, this event continues annually in HBNS. In the early 1970's, the School of Physical Education joined the newly formed College of Biological Science (CBS). This was the first step on the road to "academic respectability" at the University of Guelph. The move to CBS reflected the key role of the biological sciences in the School's undergraduate program. The major initiative of that period was the definition and philosophical development of the concept of Human Kinetics at Guelph. A degree program in this area (BSc (HK)) admitted its first students in 1972. The academic Department took up the name of Human Kinetics and moved into the newly constructed Human Kinetics Building in 1973. The death of Alex (Sass) Peepre dealt a blow to the outdoor education program in the School. During this period of change from 1966 to 1975, Dr. John T. Powell was the Director of the School. To honor his contribution, the Human Kinetics Building was renamed the J. T. Powell Building in 1993.

From 1975 to 1980 under the leadership of Dr. John D. Brooke, the main trend in the School was to identify and develop its academic role in the scientific study of human movement. The appointment of younger faculty qualified for this role such as Drs. Terry Graham, Brian Wilson, Susan Pfeiffer, Bob Webb, and Jim Wall was critical to this development. The academic growth of the School was assisted by the move of the Department of Athletics out of the School. The last vestige of the Physical Education era - the courses teaching sports and physical activities - disappeared in 1979. A new BSc specialization in Human Biology began admitting students in 1976. This program of study addressed all aspects of the human as a biological entity. By the end of the decade, enrolment in the two undergraduate streams averaged approximately 120 students per year. The research environment in the School began to develop with approval of the MSc program in the middle 1970's. The first MSc was awarded to Tom Elmslie in 1977. The title, School of Human Biology, was officially conferred by the University Senate in 1978. The "evolution" from a School of Physical Education to an academic entity was superficially complete. By the end of the decade, the majority of faculty who had developed the concept of Human Kinetics on the campus had left the School. Among those retiring or leaving were Drs. John Powell (retired), Colin Kelly, and Ross Walker as well as Jack Bruce, Cathy O'Brien, and Bob Stallman.

From 1980 to 1989, the School continued its growth into a strong academic department under the stewardship of Drs. L. A. Cooper and S. R. Blecher. The MSc program passed its first appraisal with flying colours and doctoral students began to appear in the School as some faculty joined the Biophysics Interdepartmental Graduate Program (BIG). The first doctoral student from the School (Bill McIlroy) completed a PhD through BIG in 1990. Close to 100% of the faculty had research support. Undergraduate enrolment continued strong. The turnover in faculty continued during this period as well. With the loss of Drs. Evelyn Bird, Jack Charteris, and Len Cooper, all of the faculty complement from the Physical Education period was gone. During this period, Drs. Trevor Hearn, Jim Wall, and Bob Webb also left. In the latter part of the decade, Dr. Mike Mahaney, Bill Leonard, Mike Lindinger, and Lawrence Spriet joined the School as Assistant Professors and Drs. Bill Boyd and Jack Barclay moved from the Department of Biomedical Sciences in OVC to the School at the Professor level. The relocation of the courses in Human Anatomy and in Human Physiology from OVC to the School helped to solidify the academic credibility of the School.

The period from 1989 to the merger with Dr. Jack K. Barclay as Chair was characterized by increased academic credibility and an increased presence at the University level. A BSc specialization in Bio-Medical Science was started in 1991 in collaboration with the Department of Biomedical Sciences. The BSc specialization in Human Biology was dropped due to shrinking enrolment. A Human Kinetics specialization was introduced into the Honours BSc degree and the BSc (HK) was terminated. The final graduation for the BSc (HK) degree program was June 1996 and a fine graduation it was. One of the BSc (HK) graduates (Jennifer Howey) took over the ceremony much to the delight of the HK grads and amusement of the parents. The President of the University was not amused! A good time was had by most. Undergraduate enrolment was firm and research grant income continued to strengthen. An increasing number of PhD students graduated from BIG and accelerated the development of a research environment in the School. In addition, there was a steady stream of MSc graduates in Human Kinetics. In the early 1990's, Dr. Bill Boyd retired from teaching Human Anatomy and was replaced by Francine Pilon who continued and built upon the legend of the Anatomy course. In the continual search to provide stability to the Biomechanics area, Drs. Mario Lafortune and Jim Potvin joined the faculty. As the merger was being discussed, Drs. Bill Leonard, Mike Mahaney, and Mario Lafortune left to pursue career opportunities in the United States.

Thus, during the merger talks in 1993 and 1994, the School of Human Biology brought to the table a strong undergraduate presence including BSc. specializations in Human Kinetics and in Bio-Medical Sciences as well as a strong commitment to graduate education, a developing service commitment, and an improved funding level for research into the scientific bases for the importance of lifestyle in health. In addition, the faculty complement was ideally distributed across the ranks and the age continuum.

Human Health and Nutritional Sciences

The Second Decade: Defining, Focusing and Growing (2001-2011)

(written by T. Graham)

"*As this bulldozer of change rolls over our planet, we all have to learn that if we don't become part of the bulldozer, we'll become part of the road.*"

Canadian 'Futurist' Frank Ogden, 1993

The merger of the two parent departments resulted in very healthy, viable offspring. The child entered the 21st century with great potential, a firm base and strong components; in the next decade it stood on its strong legs, grew up, established its focus and moved rapidly to begin to achieve these goals. Remarkably, in this decade there were 17 faculty hired, resulting in a net expansion of faculty numbers from 17 to 26 (Table 1) and the compliment of female faculty growing from only 18% to 42%. As well, in this decade came revitalized undergraduate programs, a new undergraduate initiative, new larger teaching labs and many new research facilities. These changes represented many millions of dollars of University investment in the Department. Due to financial pressures, four of the new faculty positions were initially contractually limited positions or limited in some other fashion, but these evolved into traditional, permanent, tenured positions within a few years.

While every era produces challenges for university education, in this decade these occurred more rapidly and were far reaching across the University, resulting in many challenges. These challenges included a complete reorganization of CBS, serious financial issues from 2005-2008 (and very serious budget cuts), the University becoming far more 'business-oriented', and students also developing a 'consumer' attitude. The successes of Human Biology and Nutritional Sciences (HBNS) would never have happened without the insight, leadership and

efforts of the previous chair, Jack Barclay. HBNS entered this phase very well prepared for the challenges of the decade; there was a mix of talented, young faculty and experienced faculty, strong, popular undergraduate programs in HBNS and HBNS was financially stable. These factors allowed HBNS to not merely address the challenges of the decade, but often to turn these challenges into opportunities. Thus, the Department not only grew in number, but also became established as a leader within the University, with new and modern undergraduate courses, upgraded facilities for teaching and research, and initiatives that were generating new revenue. Two other individuals played vital roles in the evolution of HBNS: Michael Emes and Alastair Summerlee. Michael Emes became Dean of CBS, and within a few years in his first term recognized the strength of the Department and supported our initiatives. In addition, Alastair Summerlee, initially Provost, and then University President during this decade, recognized the size and excellence of our undergraduate programs and strongly supported HBNS. Without the support from these individuals, we could not have achieved the rapid successes that we did in this decade.

Two examples of successes derived from this early support are: a) the replacement of a long-term sessional with a full-time faculty position for the teaching of anatomy succeeded by large, new teaching facilities and b) the appointment of Arend Bonen as a senior Canadian Research Chair. The former Chair provided significant budget savings and stability for the vital courses in human anatomy which resulted in incredible growth of this field into a program. Dr. Bonen's arrival was accompanied by large laboratory renovations and new research equipment. Together with his dynamic research program, these changes provided a large catalyst to the research productivity of many faculty members. These developments also resulted in a rapid increase in our research profile both within the University and globally.

The Department developed a strategic plan in 2001 that we revisited annually, and this resulted in a more cohesive, unified Department. It also allowed us to work steadily on long term projects without distractions, and to remain poised for new opportunities. This also contributed considerably to preventing the Department from being absorbed by other units as the college completely reorganized itself. We had defined ourselves and had clear long-term goals. Our plan allowed us to operate prospectively on initiatives such as revisions to our undergraduate programs and the discontinuation of our involvement in the Sports Injury Management program, and additionally directed the nature of new faculty hires. This long-term plan, in combination with our steady progress, proved to be highly valuable when challenges surfaced for the University and College. Most units had to react impulsively, while HBNS could demonstrate why the situation should not affect them negatively, and often was able to incorporate the situation into an opportunity. These annual 'reflections' also resulted in reconsideration of the Department name. Human Biology (the 'HB' of HBNS) was historical as one of the founding 'parents' in the University - the Department of Human Biology. However, the term is often associated with anthropology and was no longer an appropriate term for the current Department. Thus, in 2005 the Department was officially renamed the Department of Human Health and Nutritional Sciences (HHNS).

The reorganization of CBS was a very large undertaking including the relocation of the entire college aside from HHNS into the new Science Complex. This had a significant impact on the Department of HHNS, although we were not directly involved! We remained in the Animal Science and Nutrition building as the large, new complex lacked space for all faculty. As well, the unique aspects of our teaching and research labs and the need for frequent access to the animal wing prevented HHNS from translocating to the new complex. The Science Complex is designed for flexibility and multiple users of space, while HHNS required unique, dedicated space for biomechanics, anatomy and exercise physiology.

The CBS reorganization essentially created a new college. While on the surface, this may have seemed primarily cosmetic and insignificant, every aspect of HHNS was affected. Historically, the College budget had been allocated to support departments' core courses, staff, department activities, etc. Now, with the reorganization, these departments no longer existed

and HHNS was quite new! The College activities and budget had to be completely redesigned. The reorganization included that of support staff and the core undergraduate courses were reconsidered for the first time in decades. This, in turn, resulted in detailed examination of other activities, including the offerings within undergraduate majors – in particular, their enrollment. This provided HHNS with the opportunity to demonstrate to the College that, while we were the smallest department, our majors represented 1/3 of the CBS undergraduates and our courses represented approximately 50% of the courses taken by all CBS students.

As the College also began to question of the nature of the common core for undergraduates, Bill Bettger (with assistance from Jim Kirkland) rapidly demonstrated excellent insight and leadership. In part due to Bill's stellar efforts, a three-course 'core' for all CBS students, with HHNS offering one of the courses, was instated. This was the first time that the department was represented in this CBS core.

Throughout this time, the Department took the opportunity to comprehensively address our own programs and define the needs of each major. As a result, HHNS redesigned many of the courses within each of our majors. In addition, we were offered the opportunity to design an entirely new major in kinesiology for the University of Guelph-Humber, in collaboration with Humber College. This large undertaking was led by Elaine Popp (Humber) and Terry Graham, Lorraine Jadeski and Bill Bettger from our department. This new program was academically sound and unique, and based on generation of significant revenue. The new major was approved in 2006, and prior to its launch in 2008, it generated 3 new faculty hires for the Department. The goal was to eventually have an intake of 65 students each year, with 40 as the target for the first year. Remarkably, the initial intake was a full 65 students from over 400 applicants of high calibre. By 2010 we had to open the program to two sections of 65 and this came with additional revenue and the opportunity to hire 2 more faculty members.

The revision of our undergraduate programs was not limited to these advances. During this decade, the influx of new faculty catalysed the growth in each teaching unit. Historically, the former Department of Human Biology and the current Department commonly had only 1 or 2 faculty in Biomechanics, and the faculty would move on to other positions after a few years in the department. This resulted in few courses, a lack of continuous growth in the program, and the discipline being somewhat isolated in the Department and certainly within the College. When two faculty, Callaghan and Dickey, opted to move to other universities in 2002 and 2008 respectively, they were the 5th and 6th biomechanists to leave in approximately 25 years. However, the Department was fortunate to be able to fill these positions, and further, to expand the compliment - Vallis, Zettel and Bent, and then later in the decade, Srbely and Brown. Biomechanics became stable for the first time and each of their diverse backgrounds were central to HHNS.

Nutritional Sciences also underwent large changes. Previously, the Department had recognized the need for expertise in nutraceuticals by creating the HNRU and hiring Alison Duncan, and in nutrition-gene expression with the hire of Marica Bakovic. In this decade, opportunities arose to associate more closely with the Department of Food Science, driven in part by OMAFRA and the University recognizing that agricultural advances required the science of human nutrition. Our faculty members were successful in leading several very large, long-term OMAFRA grants that brought together several departments. We were able to hire David Mutch in nutrigenetics and David Ma to compliment the programs of Kirkland and Meckling. In addition, Amanda Wright's research complimented that of Alison Duncan and provided a link between Food Science and the HNRU. Two other new faculty, Lindsay Robinson and David Wright, brought in expertise that integrated nutrition and applied physiology. The induction of various new faculty members meant that for the first-time research areas in the Department were diverse and integrated.

These strengths were recognized by the University in their decision to relocate the HNRU from the Powell Building to the Guelph Food Technology Centre building. In 2007-08 the new 1.6-million-dollar centre was opened. It was led by faculty member Amanda Wright and for the first time was shared with the Department of Food Science, who have been intimately involved in both teaching and research.

The field of metabolism crosses these disciplines and many of the faculty are involved in aspects of the regulation of metabolism. With the addition of Arend Bonen in 2003, and subsequently Graham Holloway to the existing group, the department became a world leader. Bonen's career was recognized with membership into the Royal Society in 2010.

The expansion of faculty numbers resulted in clusters of researchers in each field and a number whose interests bridged between clusters. One area that received less attention was systemic physiology. The hiring of Jeremy Simpson in 2008 was the only new hire in this area and his expertise in cardiovascular physiology is complimentary to that of Coral Murrant. Further expansion in this area occurred in the subsequent decade.

Perhaps the area that evolved the furthest during the decade was human anatomy. As described in an earlier 'chapter', anatomy had a long history at the University under the leadership of Bill Boyd. Following his retirement, a sessional instructor, Francine Pilon offered the human anatomy course for most of a decade. This ended in 2002 when the Department was fortunate to hire Lorraine Jadeski and Lori Vallis. Shortly after, the Department was given a position for Ally Webb which not only strengthened anatomy but allowed Vallis to move into her specialty: biomechanics. In the subsequent years, under the leadership of Jadeski, the course has evolved to what could be described as a program. During the decade there were many large financial allotments to the Department for operating funds and equipment for anatomy. The facilities in the Powell building had been renovated once and were scheduled for

further expansion. However, due to central administration space needs in 2008 and despite large University-wide budget cuts, the facility was renovated to a large area within OVC that received a substantial renovation ($1.7 million).

At this time, Ally Webb took an early retirement due to health reasons. The program evolved in many ways; an anatomy course was developed for the Guelph-Humber major, fourth year elective courses were offered and in association with these, a large, novel 'outreach' initiative was launched. These offered intensive, directed experiences in aspects of anatomy for various paramedical programs in colleges and involve our senior majors in the preparation and presentation of the material. This initiative also generated significant revenue for the Department. Furthermore, graduate students completed MSc's in anatomy for the first time.

A further development during this decade was a distinct development in pedagogy. As mentioned earlier, Bill Bettger lead our efforts in the CBS common core courses and he also coordinated the examination and revitalization of our various undergraduate programs. He championed the development of innovations in teaching and was supported by Jim Kirkland and Coral Murrant. As described above, Jadeski's career had come to incorporate many innovations in the teaching of human anatomy. Further recognition of the importance of pedagogy came with the hiring of Gen Newton and Kerry Ritchie in tenure track positions in pedagogy. The importance of this new emphasis has been demonstrated with several graduate students completing theses in this field.

With new faculty hires there were often significant research lab renovations and an infusion of new research equipment. Eventually, the need for new lab space resulted in the 'invasion' into animal wing space which, in turn, directed further renovations within the remaining facility. Influx of research expertise resulted in a marked rise in traditional markers of research activity: large increases in grants, publications, graduate students and postdoctoral fellows.

During this decade, the Department also examined the graduate program. This demonstrated that the most career choices of recent graduates outside of traditional academia and the career success rate for traditional MSc grads and course work MSc grads were very similar. As a result, the department examined the graduate curriculum. This was also driven by the common element of the decade, financial pressures. Restrictions in government funding resulted in the University aggressively addressing the duration of graduate programs. The 'carrot' that came with the 'financial stick' was that the College provided stipends based on enrollment within the allotted time. The overall was a significant increase in enrollment in the MSc by coursework program. The Department realized that students in this program were in no way restricted in career choices and the structured program assured steady progress throughout the program's duration. Additionally, the flexibility of this program allowed for either a terminal graduate degree or a 'fast track' to a PhD.

As one reflects on the decade, the advances are even more remarkable with the consideration of the financial environment. There were numerous funding cuts to the University in addition to the enormous negative impact of the recession in 2008. Funding cuts and financial pressures drove the University to take a more 'business' approach to the budget. However, this approach may have benefited HHNS, and the size of student enrolment, teaching and research in this time clearly indicates that HHNS prospered well beyond what would have been expected in this time. The Department's approach to finances in combination with its willingness to bring forward innovative proposals, such as the Guelph-Humber program, Human Anatomy program, and the HNRU, were the main contributing factors to Departmental successes during this decade.

Sadly, the Department also experienced the loss of faculty alumni (Ally Webb, Harold Draper and Craig Alexander) during this time period – 2001-2011.

In the summer of 2011 Lawrence Spriet became the next chair of HHNS.

Name	Comments
Bakovic	Hired 2000
Bent	Hired 2003, joined 2005
Bettger	Hired 1982
Brown	Hired 2010
Bonen CRC	Hired 2003
Duncan	Hired 2001
Dyck	Hired 1998
Graham	Hired 1976
Holloway	Hired 2007
Jadeski	Hired 2002
Kirkland	Hired 1991
Lindinger	Hired 1987
Ma	Hired 2007
Meckling	Hired 1991
Murrant	Hired 2000
Mutch	Hired 2007
Robinson	Hired 2003
Simpson	Hired 2008
Spriet	Hired 1986
Srbely	Hired 2008
Vallis	Hired 2002
Wright, A.	Hired 2005
Wright, D. CRC	Hired 2009
Zettel	Hired 2007
Kerry/Ritchie	Hired 2011

Newton/Young	Hired 2011
Webb	Hired 2004, Retired 2009
Barclay	Hired 1971, retired 2003
Callahan	Hired 1998, left 2003
Dickey	Hired 1997, left 2008
Holub	Hired 1973, retired 2004
Wilson	Hired 1976, retired 2005
Woodward	Hired 1979, retired 2008
15 males, 12 females. Total faculty in 2011 was 26, a net increase of ~50% and women were 42%.	17 new hires; 5 retirements, 2 departures 14 males, 3 females. Women were 18% of faculty