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Carnegie Mellon University Chemical Engineering Class of 2004

Celebrating 100 years of Chemical Engineering at Carnegie Mellon University

A Newsletter from the Department of Chemical Engineering at Carnegie Mellon University 2005

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A Message From the Department Head

We have entered an important year in the history of Chemical Engineering at Carnegie Mellon. On Oct. 15, 2005 the department will have been in existence for 100 years. Herb Trott, who has been here since 1952, has taken the time to put some of his recollections on paper for this issue of the ChemE Interface. In addition, many recent of the developments described in the following pages will have an impact on the next 100 years of the department's history.

One of the most important issues that we have struggled to address is that of identifying new space or a means to renovate Doherty Hall to accommodate modernization of the department's research and development activities. After several decades of neglect, Doherty Hall will be brought into the 21st century with badly needed improvements to the teaching infrastructure. Planning and fundraising for this project will require a lot of research and the teaching infrastructure. Planning and fundraising for this project will require a lot of attention over the next couple of years but everyone in the department is excited about the prospect. This decision paves the way for the growth and the continued improvement of the Chemical Engineering Department into its second century.

Over the last year, there have been many very positive developments that are reported in this Newsletter. Among other things we have hired a new Assistant Professor of Chemical Engineering, Dr. John Kitchin. Dr. Kitchin and his wife have very generously agreed to create a endowed fund of $250,000, 2006 Mr. James Meade and his wife have very generously agreed to create a endowed fund of $250,000 to support the Meade Graduate Fellowship. This will be instrumental in helping us attract even better graduate students to our PhD program. Support of this type is extremely valuable to the department as graduate students to our PhD program. Support of this type is extremely valuable to the department as we have one of the largest PhD programs in the University. Last summer we managed to secure almost $1M in funding from the Health Resources Services Administration to be used to upgrade research equipment throughout the department. This has been enormous beneficial to many of the faculty as well as the students. Ken Meyer, who was foremost of Chemical Engineering machine shop, died in a plane crash this past summer on August 9, 2004. Ken and his nephew Quinn Peyton were flying a small plane back from California when their plane crashed near the continental divide in the Colorado Rockies.

Ken was a man of many interests and talents which he applied to all manner of pursuits including dressage, piano, flying, ice hockey …. and the list goes on. He had informed opinions on any subject and loved to talk about anything with anyone. As he put it, he ran a “full-service shop” providing everything from expert design capabilities to philosophical and political discourse. In addition, he was a connoisseur of fine single malt Scotch.

While we all valued Ken’s technical expertise, knowledge and professionalism very highly I think that everyone in the department appreciated Ken equally for the person he was. Outside the department (and sometimes inside) my own interaction with Ken centered on ice hockey which he took up a year after learning to skate at the age of 47. We would practice on Thursday mornings and then play in a local league in the evenings. Ken started knowing literally nothing about hockey but had no fear of trying. I remember having a very bad feeling when, on the way to our first game in the Senior League, he asked me to start explaining the rules. Of course, the rules weren’t really the major problem that night. Ken did get better though and managed to score his first goal in his first season.

As always, my colleagues and our students continue to excel and to bring recognition to the department. I am sure that you will enjoy reading about their accomplishments in the following pages.

Andy Gellman

In Memory of Ken Meyer

June 26, 1950 – August 9, 2004

Very unfortunately, Ken Meyer, who was foremost of Chemical Engineering machine shop, died in a plane crash this past summer on August 9, 2004. Ken and his nephew Quinn Peyton were flying a small plane back from California when their plane crashed near the continental divide in the Colorado Rockies.

Ken came to Carnegie Mellon in April, 1977 to join the department of Chemical Engineering as an ‘Instrument Maker’. At the time he held a BA in Physics and in Philosophy from the SUNY at Oswego and in 1982 he received an MSc degree in Physics from Carnegie Mellon. Since then he worked in the department of Chemical Engineering as a designer and fabricator of research and teaching instrumentation. Ken made some of the finest research instrumentation used in the department and created many such devices for other departments at Carnegie Mellon and for research programs at universities across the country. In recognition of his outstanding service to the university, Carnegie Mellon awarded Ken the 1996 Andy Award for Customer Satisfaction.

In his memory, we have created the Ken Meyer Memorial Fund to establish the Ken Meyer Award to be given to one of our graduates at commencement each year.

Andy Gellman
Art Westerberg's 65th Celebration was highlighted by speakers from all over the country. In addition to Andy Gellman, Ignacio Grossmann, and Larry Biegler, other speakers from academia included George Stephenopolous (MIT), Greg Stephenopolous (MIT), Ed Cussler, (University of Minnesota), Jack Ponton, (University of Edinburgh), Hirokazu Nishitani, (Nara Institute of Science and Technology), G.V. Reklaitis (Purdue University), and Andy Hrymak (McMaster University). Jeff Siirola, from Eastman Chemical Company also presented a talk.

After the day's events, cocktails and dinner were held in Art's honor at the Monterey Bay Fish Grotto atop Mt. Washington. After the day's events, cocktails and dinner were held in Art's honor at the Monterey Bay Fish Grotto atop Mt. Washington. After the day's events, cocktails and dinner were held in Art's honor at the Monterey Bay Fish Grotto atop Mt. Washington.

Professor Westerberg has been a pioneer in the area of computer-aided process design. He was one of the first researchers to provide scientific foundations for the areas of process simulation and optimization. He has been a pioneer in the areas of process synthesis and information modeling. Aside from basic theory, his work has been implemented in advanced software systems such as ASCEND for process modeling, SPLIT for synthesis of azeotropic columns and n-dim for information modeling.

Chemical Practice was one of the original courses of study offered by the Carnegie Technical Schools when they opened their doors on Oct. 15, 1905. The program was offered at the time through the School of Applied Science.

The first head was Joseph James who lasted in that position until 1936, a tenure that is probably unbeatable. Originally the department housed Carnegie Tech's activities in both chemical engineering and in chemistry. In 1936 the two disciplines diverged and Warren McCabe became head of the Department of Chemical Engineering with a faculty of five.

Randomly 50 years after Chemical Engineering started and almost twenty years after it separated from Chemistry there were 6 faculty members: Carl Monrad, Bob Beckmann, Bob Rothschild, Larry Canjar, Dave Archer and I. Dave and I joined at about the same time. It was a remarkably congenial group. Carl Monrad (1947-1965) had worked on the synthetic rubber program during the Second World War. He had recently succeeded the former head, Warren McCabe (1936-1947), and was a fine, old school boss. Dave was straight laced, Bob Rothschild had found religion and the rest of us enjoyed life. There was nothing here like the storied tales of faculty backbiting. The favorite was Larry Canjar, a 300 lb down-to-earth son of a Croat immigrant steelworker who went on an unplanned diet in a foreshadow during the Battle of the Bulge.

In the 1950's there were about as many undergraduate students as now (40 - 60 per class) but less than a quarter of the current number of graduate students or even less (10 or 15 in total). The undergraduates came from less affluent families than now. There were fewer, if any, women and many of the students were children of steelworkers. Teaching loads were higher; usually two courses a semester although some taught three at least one semester. Everyone was doing research except perhaps Carl Monrad, but it was done on the cheap using industrial grants or bootlegged department funds. At the time faculty weren't expected to support graduate students who must have been supported by teaching assistantships and industrial fellowships.

It was clear by the mid-20th century that a lot of the ideas in chemical engineering, based as they were on empiricism and correlations, rested on weak foundations. More fundamental research was needed and indeed that began both here and elsewhere. This was part of the zeitgeist after the World War II which demonstrated the value of science and engineering and was reinforced by the subsequent rise of the National Science Foundation (NSF) which funded engineering science and became the primary source of academic research funds (significantly greater than the former industrial research funds).

Bird, Stewart and Lightfoot's book Transport Phenomena published in 1960 introduced much new material into the curriculum and both broadened and deepened the move toward fundamentals. They brought these ideas to a wider audience and transformed chemical engineering, but it was the NSF which facilitated the transformation of chemical engineering at Carnegie Mellon and in the US at large. Increased student numbers and increased research funding as well as additional funding from government, industry and private foundations provided the resources needed to carry out the transformation.

After I became department head (1965 - 1970) we bought a house adjacent to the Schenley Park golf course and I frequently walked to the campus with Herb Simon whose path and time often coincided with mine. I found him a fascinating walking companion; full of interesting ideas and questions, and only long after we met did I find out that my fellow hiker was by then the famous Herb Simon who intimidated many people. Of course, by then I had been talking and arguing with him too long to be intimidated.

One day Herb said something like, "you engineers do a poor job of teaching design and my book, The Sciences of the Artificial will show you how to improve things." I agreed about the problem; design, which is about synthesis, never fitted well into the increasingly analytical, engineering curriculum and it was not thought to be sufficiently scientifically rigorous or researchable to be taken seriously. It was not taught heavily by most faculty.

If Herb Simon's ideas could be put into practice it would make design respectable. Design would be intellectually respectable, something that could be a lodestar for academic engineers. This insight offered us the rare opportunity to be first in a new area. While I was still head, Herb Simon gave a seminar on the subject in Chemical Engineering but nothing much happened. Shortly before that CIT had missed out in a contest for Skan Foundation funds to improve engineering design education. But funding wasn't the problem, ideas were. I thought that we now might have them - but others need convincing and focusing was required.
Herb and I went to NSF very early in the game looking for money for design and Herb gave a short talk to people in the Engineering Directorate. They responded, “very interesting, but unfortu-
nately it doesn’t fit into any of our programs so we can’t help.” Being early with ideas was as bad as being late, at least at NSF. But they weren’t and aren’t unique.

Fortunately, thanks to Steve Au and Jim Romauldi, we had recently hired Steve Fervis as head of Civil Engineering. I think Steve was my first department head hire as Dean - and was very much a lucky chance in light of our later moves in the design field. I asked Steve, one of the earliest people in computer aided design and an easy convert, if not already a believer, to chair a committee to decide whether and how Herb Simon’s ideas could be imple-
mented across CIT. I was already a convert, even if not an expert. After some wrestling, Steve recommended him, and Gary became the best recruitment, as Herb Simon about his own work in design which fitted nicely into a likely hot new area. It was a perfect fit in Carnegie Mellon. Such highly respectable research so successful participants would be pro-
duced across CIT. I was already a convert, even if not an expert. It took some kicking). I remember establishing design research in I remember that the Colloids, Polymers and Surface Science became involved in the design effort.

Among the new faculty who were recruited in the 1960’s was Howard Brenner who joined the department in 1966 with a reputation in fundamental fluid mechanics. He not only brought his expertise and reputation to the department, but his presence helped signal the direction in which the department was moving, attracting additional faculty with similar mindsets. Tom Fort made good use of Howard’s presence by recruiting valuable new faculty. It was during that time that the Colloids, Polymers and Surface program started with Fennell Evans as the director while Ed Cudzer, a fertile source of new ideas, initiated the New Alterna-
tives Program.

In the early 1960’s a project course was set up in Chemical Engineering to look at environmental issues. This was run by Mike Massey, a chemical engineering graduate student who eventually joined the faculty as an instructor. This course pro-
duced the first decent Emissions Inventory for Allegheny County and became the model for future Environmental and Public Policy project courses that led to the formation of the EEP department in CIT.

When it became clear to those that we had a winner in the Design Research Center, I asked Gary who was the best guy in Chemical Engineering in the field. He mentioned Art Westerberg so, I asked Tom to recruit Art which he did. I gave Tom credit for being a great recruiter, which he was, but as Art later told me, we got him here to a large extent because of the Barbara Westerberg’s attraction to the Pittsburgh Symphony. I probably increased Tom’s budget to get Art, but that was certainly a fine investment.

Then it was decided that we needed someone in Electrical Engineering and Art suggested Steve Director who had been at Florida when his was there. After some nagging Art Jordan, then head of Electrical Engineering managed to bring him here; another good investment. A further payoff from Art was the great Ignacio Grossmann from Imperial College, completing a stellar group of Chemical Engineers. Eventually, however, people from all CIT departments other than perhaps Metallurgy and Materials Science became involved in the design effort.

100 Years... continued
The following papers were presented by our faculty and graduate students at the AIChE annual meeting in Austin, TX November 7-12, 2004:


Donalase, H.M., Presto, A., Huff, H., Kraft, K. “NSA production from monoterpene ozonolysis: effects of NOx concentration on particle yield and composition.”


Grossmann, I.E., Goel, V. “Gas field development planning under uncertainty.”


Hartz, K., “SOA production from monoterpene ozonolysis: effects of NOx concentration on particle yield and composition.”

Hartz, K., “SOA production from monoterpene ozonolysis: effects of NOx concentration on particle yield and composition.”

Donahue, N.M., Presto, A., Stainier, C. “Temperature Dependent Production of Secondary Organic Aerosol Following Terpene Ozonolysis.”

Grossmann, I.E., Goel, V. “Gas field development planning under uncertainty.”


From each of these presentations, we have discovered and pioneered methods for making chiral surfaces from metals and other materials with achiral bulk structures. Such surfaces can, in principle, be used for enantioselective separations to purify chiral compound or as enantioselective catalysts for synthesis of chiral compounds from achiral reagents. These are far more thermally stable than chiral surfaces based on the adsorption of chiral organics compounds.

The chiral surfaces research program has expanded beyond the walls of the department to include researchers in Materials Science and Engineering, and in Physics and to include collaboration with researchers across the country. The scope of the research includes everything from surface chemistry to computational modeling of adsorption on chiral surfaces to development of methods for the preparation and use of large area chiral surfaces suitable for applications in chemical processing. In 2004, we have discovered and pioneered methods for making chiral surfaces from metals and other materials with achiral bulk structures. Such surfaces can, in principle, be used for enantioselective separations to purify chiral compound or as enantioselective catalysts for synthesis of chiral compounds from achiral reagents. These are far more thermally stable than chiral surfaces based on the adsorption of chiral organics compounds.

From each of these presentations, we have discovered and pioneered methods for making chiral surfaces from metals and other materials with achiral bulk structures. Such surfaces can, in principle, be used for enantioselective separations to purify chiral compound or as enantioselective catalysts for synthesis of chiral compounds from achiral reagents. These are far more thermally stable than chiral surfaces based on the adsorption of chiral organics compounds.
**Open House**

March 5, 6 & 7, 2004, the Department hosted an open house weekend for prospective graduate students, which included visits with individual professors and group meetings detailing the Department’s research areas and interests, as well as informal tours and dinners with faculty and current graduate students.

**AIChE Annual Meeting**

The AIChE Annual Meeting was held during the week of November 7-12, 2004 at the Austin Convention Center, Austin, Texas. The department held its always popular reception on Monday evening.

**CAPD Short Course**


**National Engineers’ Week at the Carnegie Science Center**

ACS National Chemistry Week at the Carnegie Science Center for 2004 had the theme this year of “Health and Wellness”. Student and faculty volunteers from Chemical Engineering presented the amazing properties of heat shrinking polymers that included Shrinky Dink® plastic toys and shrinking polymer films used as safety seals for food and medicine products and as labels for bottles and jars. Rosemary Frollini, lab manager of the CPS Program, coordinated the event in which 500 people participated for bottles and jars. Rosemary Frollini, lab manager of the CPS Program, coordinated the event in which 500 people participated.

**Ignacio Grossmann**

Ignacio Grossmann returned from his sabbatical leave taken during the 2003-2004 academic year. He spent the first part in Spain at the University of Cantabria as a Fulbright Lecturer. The second part was spent in Switzerland at the Institut fur Automatik at the ETH in Zurich. Finally, he spent two weeks at the Center for Process Systems Engineering at Imperial College in London.

**The Class of 2004 went to the following graduate schools:**

- California Institute of Technology
- Carnegie Mellon University
- Cornell University
- Illinois Institute of Technology
- Johns Hopkins University
- Purdue University
- Madison University

**Placement - Class 2004**

Placement statistics for the 2004 Senior Class are as follows:

- The average starting salary was $51,087. The high was $59,000 and the low $24,000.

**Seniors were hired by the following companies:**

- Aventis
- Bristol Meyers Squibb
- Caterpillar
- Exxon Mobil
- Emergency Physicians of N. Va. Ltd.
- GPS Consulting
- L’Oreal
- Merck

**The Class of 2004 went to the following graduate schools:**

- Caltech
- Stanford University
- CMU
- UC Berkeley
- Cornell University
- University of Delaware
- Illinois Institute of Technology
- University of Minnesota
- Johns Hopkins
- University of Pennsylvania
- Purdue
- University of Pittsburgh
- Madison
- University of Wisconsin

**Senior Banquet**

The sixth annual senior banquet sponsored by AIChE and the department was held on May 11 at Club Chemistry in the Strip District for all graduating seniors, faculty and staff. The faculty were cajoled into performing in a play written by the seniors. While everyone enjoyed the spectacle, there will be no Emmys, Oscars or Tonys awarded on the basis of faculty performances.
Congratulations to Larry Biegler, Ignacio Grossmann and Dennis Prieve who have been elected Fellows of the American Institute of Chemical Engineers.


Lee White, Dennis Prieve and John Anderson organized the “International Electrokineistics Conference” (ELKIN) on campus from June 13 to 17, 2004. This technical meeting had 85 participants from 22 countries, who submitted 63 oral presentations and 30 posters. There were four plenary speakers: Armand Ajdari (Ecole Supérieure de Physique et de Chimie Industrielles of Paris), Menachem Elimelech, (Yale), Ian Morrison (Cabot Corporation) and Juan Santiago (Stanford). Costs of running the conference were partially underwritten by a generous grant from Los Alamos National Laboratory’s Yucca Mountain Project. There have been seven ELKIN meetings occurring every other year with the previous meeting held in Cracow, Poland and next meeting being planned in Nancy, France. This is the first time ELKIN was held in North America. More information can be found at the meeting website: http://www.andrew.cmu.edu/user/dcprieve/ELKIN/index.htm

Congratulations to Professor Spyros Pandis who received the Kun Li Award for Excellence in Education at the 2004 Commencement ceremony. The Kun Li Award has been established to promote excellence in teaching in chemical engineering, and to recognize Emeritus Professor Li who taught in the department from 1962 to 1988.

Andy Gellman has been appointed to the editorial board of the journal Catalysis Letters.

Myung Jhon, Professor of Chemical Engineering has been selected as the Carnegie Institute of Technology Faculty Chair-Elect. He has been a faculty member for 23 years. In addition to outstanding research in multi-disciplinary areas, he has received several teaching awards including the Ryan Award. He also serves as an ABET evaluator.

John Anderson, Professor of Chemical Engineering, former department head and most recently the Dean of CIT left Carnegie Mellon after 28 years of service to take a position as Provost of the Case Western Reserve University in Cleveland. John served as head for the department for 11 years and was one of our most distinguished faculty members.

CAPD Annual Review
The Annual Review Meeting of the Centre for Advanced Process Decision-making took place March 8 & 9, 2004. The meeting was attended by industrial participants from various chemical and technology companies. Events of the meeting included: presentations by departmental faculty, students, and industrial participants, a poster session, cocktail reception, luncheons, and a superb dinner at the LeMont Restaurant.
Graduate Student News

26th Chemical Engineering Graduate Student Association (ChEGSA) Symposium

The department shared its research progress at the 26th Chemical Engineering Graduate Student Association (ChEGSA) Symposium held on October 21 and 22. Awards were given for the best presentations and the best poster. The award winners are as follows:

The Geoffrey D. Parfitt Memorial Award (best presentation) was presented to Preeti Kamakoti. Preeti works for David Sholl and gave a talk entitled “Quantitative prediction of hydrogen fluxes through Copper-Palladium Alloy membranes based on first principles.”

The Student Poster Award was presented to Andy Kusumo. Andy works for Jim Schneider and Bob Tilton and presented a poster entitled “Thermally Responsive Polymer at Surface: Development of Surface Plasmon Resonance System.”

Honorable Mention (4th and 5th place presentations) was given to Anjanette J. Kortnik and John D. Siirola. Anjanette works for Andy Gillman and gave a talk entitled “The Quest for Chiral Surfaces with Maximum Enantioselectivity.” John works for Steinar Hauan and Art Westerberg and gave a talk entitled “Polymeric Optimization.”

Sarette Van den Heever, who obtained her Ph.D. in 2001 under the direction of Ignazio Grossmann, has been selected winner of the W. David Smith, Jr. Graduate Student Paper Award from the CAST Division of AIChE, for the paper “An Iterative Aggregation/Disaggregation Approach for the Solution of a Mixed Integer Nonlinear Oil Field Infrastructure Planning Model,” Ind. Eng. Chem. Res. 39, 1955-1971 (2000). Sarette received the award at the Annual AIChE meeting in Austin.

Congratulations to Danilo Pozzo, Susan Daly and Ijeoma Nnebe who were awarded the PPG Industries graduate fellowships for this academic year. The PPG Fellowship recognizes excellence in research and professional promise.

The Society of Women Engineers’ Carnegie Mellon Chapter sponsored High School Day on campus. 350 high school juniors and seniors from the tri-state area visited Carnegie Mellon to attend workshops presented by faculty and student volunteers. Opportunities in engineering and science careers were the focus. Chemical Engineering teaching professor Annette Jacobson and chemical engineering students Maureen Tang and Anita Shukla presented a hands-on workshop about engineered products made from polymers. Included were examples from the toy, food, cosmetic, personal care, pharmaceutical and agricultural industries.

Undergraduate Student News

AIChe Student Night

The Pittsburgh Chapter of AIChe sponsored its annual Student Night program on Wednesday, February 11th from 6pm - 9pm at the William Pitt Union in Oakland. Bill Byers, the National President of AIChe spoke on “The Employee as Entrepreneur — A Marketing Approach to a Successful Career.” This was a great chance for students to meet colleagues at other institutions and network with local industry. Students involved with undergraduate research presented posters at the poster session.

Congratulations to Steve Back who received the 2003 AIChe Othmer Award.

The introduction to Chemical Engineering students in Professor Gary Povers’ class designed, constructed, tested and competed chemical boats. The students selected the chemistry, reactor vessel, propulsion mechanism and boat design. Through a blend of experiments and theory they calibrated their design so that the boat would travel a given distance (10 to 30 meters) while loaded with 0 to 500 grams of water. The distance and load were given to the design teams one hour before the race.

The day of the race was blessed with beautiful weather and a great crowd at the Chemical Engineering Lake (one half of 18 inch PVC pipe, 80 feet long) at the Fence. The teams adapted well to the wind conditions, distance (15 meters) and load (100 grams). The winning team was Fred Yuan, Calvin Ng and James Tsui. Their boat stopped 15 centimeters from the target distance. Well done! The winners were recognized by holding the Chemical Boat Cup for one week.

Several of the boats demonstrated unique chemistries (peroxide decomposition catalyzed by manganese dioxide or yeast, electrochemical cells) as well as sodium bicarbonate plus acetic acid. Delayed mixing or controlled release of the reagents controlled the reactions.

Designs of the boats varied from the most utilitarian (one two-liter bottle with a hole in the cap) to a very elaborate pink creation complete with a ship’s captain, ribs, flags and a two-stage propulsion system.

The students learned to work in teams, prepare written and oral progress reports, deal with experimental uncertainty and meet very tight deadlines. Senior chemical engineers served as consultants and their help was greatly appreciated. Mr. Matt Cline, laboratory instructor, assisted with the construction and design. Thanks Matt!
Graduate Student News

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The Geoffrey D. Parfitt Memorial Award (best presentation) was presented to Preeti Kamakoti. Preeti works for David Sholl and gave a talk entitled "Quantitative prediction of hydrogen fluxes through Copper-Palladium Alloy membranes based on first principles.”

The Symposium Award (2nd and 3rd place presentations) was presented to Jeffrey A. Fagan and Albert A. Presto. Jeff works for Dennis Prieve and Paul Sides and gave a talk entitled “Explaining Colloidal Particle Motion in an AC Electric Field.” Albert works for Neil Donahue and gave a talk entitled “SAO production from monoterpenes: Effects of NOx concentration on particle yield and composition.”

Honorable Mention (4th and 5th place presentations) was given to Anjanette J. Kortnik and John D. Slirola. Anjanette works for Andy Gellman and gave a talk entitled “The Quest for Chiral Surfaces with Maximum Enantioselectivity.” John works for Steinar Hauan and Art Westerberg and gave a talk entitled “Polymeric Optimization.”

The Student Poster Award was presented to Andy Kusumo. Andy works for Jim Schneider and Bob Tilton and presented a poster entitled “Thermally Responsive Polymer at Surface: Development of Surface Plasmon Resonance System.”

Dave Rampulla was awarded one of the AVS Graduate Student Awards for 2004. Dave works with Andy Gellman studying enantioselective chemistry on naturally chiral metal surfaces. He received his award at the AVS National Meeting in November 2004.

Congratulations to Danilo Pozzo, Susan Daly and Ijeoma Nnbei who were awarded the PPG Industries graduate fellowships for this academic year. The PPG Fellowship recognizes excellence in research and professional promise.

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Congratulations to Kris Howard, who is this year’s recipient of the AIChE Professional Promise Award from the Pittsburgh Section of AIChE. Kris received his award at the AIChE Student Night (February 11th).

Chemical Boat Competition

Spring 2004

The Introduction to Chemical Engineering students in Professor Gary Povers’ class designed, constructed, tested and competed chemical boats. The students selected the chemistry, rector vessel, propulsion mechanism and boat design. Through a blend of experiments and theory they calibrated their design so that the boat would travel a given distance (10 to 30 meters) while loaded with 0 to 500 grams of water. The distance and load were given to the design teams one hour before the race.

The day of the race was blessed with beautiful weather and a great crowd at the Chemical Engineering Lake (one half of 18 inch PVC pipe, 80 feet long) at the Fence. The teams adapted well to the wind conditions, distance (15 meters) and load (100 grams). The winning team was Fred Yuan, Calvin Ng and James Tsui. Their boat stopped 15 centimeters from the target distance. Well done! The winners were recognized by holding the Chemical Boat Cup for one week.

Designs of the boats demonstrated unique chemistries (peroxide decomposition catalyzed by manganese dioxide or yeast, electrochemical cells) as well as sodium bicarbonate plus acetic acid. Delayed mixing or controlled release of the reagents controlled the reactions.

The students learned to work in teams, prepare written and oral progress reports, deal with experimental uncertainty and meet very tight deadlines. Senior chemical engineers served as consultants and their help was greatly appreciated. Mr. Matt Cline, laboratory instructor, assisted with the construction and design. Thanks Matt!
Polymers from Corn
The Unit Operations Laboratory students in Professor Gary Powers’ class designed, performed laboratory experiments for scale-up and cost estimation, and optimized a process for converting corn into 1,3-propanediol (PDO). The PDO was reacted with PTA to form the polyester PTT that was extruded into fiber. The students performed corn steeping, corn grinding, centrifugal separation of gluten from starch, fermentation of starch to glucose, separation of glucose, fermentation of glucose to glycerol, separation of glycerol, fermentation of glycerol to PDO and separation of PDO. The PDO was polymerized with PTA and spun into PTT fibers.

The students designed the experiments, calibrated the analytical equipment, stage-gate scheduled the project and created numerous written and oral reports. The complete class of 60 students coordinated their work to achieve this very ambitious project. Laboratory instructor, Mr. Matt Cline, greatly assisted with the design and construction of these laboratory and pilot scale processes. Numerous faculty members gave excellent consulting advice on the unit operations and chemistry involved. Thank you faculty!

Professor Powers received a beautiful t-shirt made from corn at the senior banquet. Thank you seniors!

Students have fun worrying about heat transfer.

Undergraduate Student News
Graduation 2004 Awards

The Mark Dennis Karl Outstanding Teaching Assistant Award recipient was Anjanette Koritnik.

AICHE Professional Promise Award was presented to Kris Howard. The Professional Promise Award is sponsored each year by the Pittsburgh Section of the AICHE to recognize extraordinary levels of achievement and outstanding potential for future professional success. This award, which includes a plaque and a monetary award, was formally presented at the AICHE student night earlier in the semester.

Ken Westerberg Award was presented to Ben Anderson. The memorial fund “The Ken Westerberg Memorial Prize for Excellence in Chemical Engineering Research” has been established by our department with a generous contribution from Friends of the department and of the Westerbergs. This prize is presented every year during the departmental graduation ceremony to a senior who has shown exceptional promise in research in chemical engineering. This prize has been established in the memory of Ken Westerberg who died of Leukemia at the very young age of 35. Ken was the son of Art & Barbara Westerberg.

Geoffrey D. Parfitt Award for Excellence in Research was presented to Greg Allen. This award is given in Professor Parfitt’s memory.

American Institute of Chemists Foundation Award “For Ability, Character, Scholastic Achievement and Potential” was presented to Mithun Shenoi. The recipient is selected based on ability, character, scholastic achievement, and professional potential.

Carnegie Mellon McCabe Society honors the memory of Warren McCabe, one of the great leaders in this department’s history, by recognizing students who show an unparalleled dedication to their community. The inductees from the Class of 2004 are: Lisa Branden, Becky Gerard, Matt Helgeson, Molly Hosier, Martha Ottenberg.

Congratulations to Larry Biegler, Ignacio Grossmann and Dennis Prieve who have been elected Fellows of the American Institute of Chemical Engineers.


Lee White, Dennis Prieve and John Anderson organized the “International Electrokinetics Conference” (ELKIN) on campus from June 13 to 17, 2004. This technical meeting had 85 participants from 22 countries, who submitted 63 oral presentations and 30 posters. There were four plenary speakers: Armand Ajdari (Ecole Supérieure de Physique et de Chimie Industrielles de Paris), Menachem Elimelech, (Yale), Ian Morrison (Cabot Corporation) and Juan Santiago (Stanford). Costs of running the conference were partially underwritten by a generous grant from Los Alamos National Laboratory’s Yucca Mountain Project. There have been seven ELKIN meetings occurring every other year with the previous meeting held in Cracow, Poland and next meeting being planned in Nancy, France. This is the first time ELKIN was held in North America. More information can be found at the meeting website: http://www.andrew.cmu.edu/user/dcprieve/ELKIN/index.htm

Congratulations to Professor Spyros Pandis who received the Kun Li Award for Excellence in Education at the 2004 Commencement ceremony. The Kun Li Award has been established to promote excellence in teaching in chemical engineering, and to recognize Emeritus Professor Li who taught in the department from 1962 to 1988.

Myung Jhon, Professor of Chemical Engineering has been selected as the Carnegie Institute of Technology Faculty Chair-Elect. He has been a faculty member for 23 years. In addition to outstanding research in multi-disciplinary areas, he has received several teaching awards including the Ryan Award. He also serves as an ABET evaluator.

John Anderson, Professor of Chemical Engineering, former department head and most recently the Dean of CIT left Carnegie Mellon after 28 years of service to take a position as Provost of the Case Western Reserve University in Cleveland. John served as head for the department for 11 years and was one of our most distinguished faculty members.

CAPD Annual Review
The Annual Review Meeting of the Centre for Advanced Process Decision-making took place March 8 & 9, 2004. The meeting was attended by industrial participants from various chemical and technology companies. Events of the meeting included: presentations by departmental faculty, students, and industrial participants, a poster session, cocktail reception, luncheons, and a superb dinner at the LeMont Restaurant.

Andy Gellman has been appointed to the editorial board of the journal Catalysis Letters.

Professor Li who taught in the department...
Open House
March 5, 6 & 7, 2004, the Department hosted an open house weekend for prospective graduate students, which included visits with individual professors and group meetings detailing the Department’s research areas and interests, as well as informal tours and dinners with faculty and current graduate students.

AIChE Annual Meeting
The AIChE Annual Meeting was held during the week of November 7-12, 2004 at the Austin Convention Center, Austin, Texas. The department held its always popular reception on Monday evening.

CAPD Short Course

National Engineers’ Week at the Carnegie Science Center
ACS National Chemistry Week at the Carnegie Science Center for 2004 had the theme this year of “Health and Wellness”. Student and faculty volunteers from Chemical Engineering presented the amazing properties of heat shrinking polymers that included Shrinky Dink® plastic toys and shrinking polymer films used as safety seals for food and medicine products and as labels for bottles and jars. Rosemary Frollini, lab manager of the CPS Program, coordinated the event in which 500 people participated.

Placement - Class 2004
Placement statistics for the 2004 Senior Class are as follows:

The average starting salary was $51,087. The high was $59,000 and the low $24,000.

Seniors were hired by the following companies:

- Aventis
- Bristol Meyers Squibb
- Caterpillar
- Exxon Mobil
- Emergency Physicians of N. Va. Ltd.
- GPS Consulting
- L’Oreal
- Merck

The Class of 2004 went to the following graduate schools:

- Caltech
- Carnegie Mellon University
- Cornell University
- Illinois Institute of Technology
- University of Delaware
- CMU
- UC Berkeley
- University of Delaware
- University of Minnesota
- Johns Hopkins University
- University of Pittsburgh
- Purdue University
- University of Wisconsin

Senior Banquet
The sixth annual senior banquet sponsored by AIChE and the department was held on May 11 at Club Chemistry in the Strip District for all graduating seniors, faculty and staff. The faculty were cajoled into performing in a play written by the seniors. While everyone enjoyed the spectacle, there will be no Emmys, Oscars or Tonys awarded on the basis of faculty performances.

Mike Domach is on sabbatical this year: Mike will take his sabbatical at the Jackson Laboratory and the University of Maryland’s Bioengineer Program to pursue advanced study in genomics & to assess the need for publishing a primer on Biomolecular Engineering Fundamentals.

Bob Tilton accepted a 50:50 position between Biomedical Engineering and Chemical Engineering. Professor Tilton will be teaching one CH&E and one BME course each year.
Chirality is an intrinsic feature of life on Earth. The amino acids, proteins, enzymes, and DNA on which life is based are all homochiral. In other words, rather than existing in both right- and left-handed forms, only one of the two enantiomers is ever found in living organisms. As a direct consequence, the handedness of chiral molecules ingested by living organisms dictates their physiological impact. Most pharmaceuticals, for example, are chiral and thus exist as both left- and right-handed enantiomers, one of which is therapeutic while, more often than not, the other is toxic. If administered as a mixture of the two enantiomers, the toxicity of one enantiomer often outweighs the therapeutic value of the other. As a result the majority of drugs currently being developed for introduction into the marketplace are enantiomerically pure. This represents a $50-150 billion industry founded on enantioselective chemical processing.

Enantioselectivity is arguably the most subtle form of chemical selectivity. The melting points, boiling points, densities, solubilities, and other properties commonly used as the basis for selectivity or separations are identical for both enantiomers of a chiral compound. The properties of the two enantiomers are only differentiated in a chiral environment. For example, their solubilities in an enantiomerically pure chiral solvent will differ. Such enantioselective differences are the basis for all enantioselective chemical processes.

Many large scale chemical processes occur at surfaces. Heterogeneous catalysis is an obvious example, but others include chromatographic separations, selective adsorption, and crystallization. Chiral surfaces can differentiate the two enantiomers of a chiral molecule and thus be used for enantioselective synthesis of pharmaceuticals. As an example, chiral chromatography uses high surface area stationary phases that are templated with enantiomerically pure chiral organic ligands. In practice, most chiral surfaces have been prepared by adsorption of chiral ligands on otherwise achiral substrates. In chemical engineering at Carnegie Mellon, we have discovered and pioneered methods for making chiral surfaces from metals and other materials with achiral bulk structures. Such surfaces can, in principle, be used for enantioselective separations to purify chiral compounds or as enantioselective catalysts for synthesis of chiral compounds from achiral reagents. These are far more thermally stable than chiral surfaces based on the adsorption of chiral organics compounds.

The chiral surfaces research program has expanded beyond the walls of the department to include researchers in Materials Science and Engineering, and in Physics and to include collaboration with researchers across the country. The scope of the research includes everything from surface chemistry to computational modeling of adsorption on chiral surfaces to development of methods for the preparation and use of large area chiral surfaces suitable for applications in chemical processing.

**Andy Gellman**

**Single-Handed Surfaces**

To many chemical engineers chirality is a seemingly trivial and unimportant property of organic molecules that receives unwarranted attention in organic chemistry. Chiral molecules are those with structures that are non-superimposable on their mirror images. In the macroscopic world your hand is chiral because the right hand is distinct from the left hand. A soccer ball, on the other hand, is achiral because it is identical to its mirror image. As it turns out, chirality is a critically important property of complex molecules such as pharmaceuticals, agrochemicals and almost all other bioactive molecules.

Chirality is an intrinsic feature of life on Earth. The amino acids, proteins, enzymes, and DNA on which life is based are all homochiral. In other words, rather than existing in both right- and left-handed forms, only one of the two enantiomers is ever found in living organisms. As a direct consequence, the handedness of chiral molecules ingested by living organisms dictates their physiological impact. Most pharmaceuticals, for example, are chiral and thus exist as both left- and right-handed enantiomers, one of which is therapeutic while, more often than not, the other is toxic. If administered as a mixture of the two enantiomers, the toxicity of one enantiomer often outweighs the therapeutic value of the other. As a result the majority of drugs currently being developed for introduction into the marketplace are enantiomerically pure. This represents a $50-150 billion industry founded on enantioselective chemical processing.

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**Department News**

**Andrea Gelman, Single-Handed Surfaces**

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**Senator Arlen Specter visits Chemical Engineering**

On Thursday, Oct. 21, 2004 US Senator Arlen Specter visited the Department of Chemical Engineering to tour the facilities and to learn about some of our research programs. Senator Specter has served four consecutive terms as a Pennsylvania Senator and was re-elected recently to a fifth term. He has been a strong supporter of education and of health and medical research.

Senator Specter visited the department to learn about research on the development of new chiral materials for enantioselective chemical processing. Most pharmaceuticals are chiral compounds and enantioselective chemical processes are some of the most difficult steps in their production and purification. Andy Gelman and David Sholl have ongoing research in this area in collaboration with a number of other groups at Carnegie Mellon (see article to the left entitled “Single-Handed Surfaces”).

The Department recently received a grant of almost $1M for work on chiral materials from the Health Resources & Services Administration. This grant is being used to purchase instrumentation to support research in the department and greatly expands our experimental and computational infrastructure. Senator Specter’s visit was an opportunity for him to learn about the nature of the research at Carnegie Mellon and to understand the role that these funds play in the department’s ongoing research programs.

During his visit to the department Senator Specter met with CMU President Jared Cohon, CIT Dean Pradeep Khosla, several Chemical Engineering faculty and a number of the graduate students working on enantioselective chemical processes. In addition, he met with the media to comment on the important role of research in health care.
100 Years… continued

Herb and I went to NSF very early in the game looking for money for design and Herb gave a short talk to people in the Engineering Directorate. They responded, “very interesting, but unfortunately it doesn’t fit into any of our programs so we can’t help.” Being early with ideas was as bad as being late, at least at NSF. But they weren’t and aren’t unique.

Fortunately, thanks to Steve Au and Jim Romauldi, we had recently hired Steve Fervis as head of Civil Engineering. I think Steve was my first department head hire as Dean - and was a very lucky choice in light of our later moves in the design field. I asked Steve, one of the earliest people in computer aided design and an easy convert, if not already a believer, to chair a committee to decide whether and how Herb Simon’s ideas could be implemented across CIT. I was already a convert, even if not an expert. I had no doubts; it just looked like a winner, and it indeed was! After what seemed like a long time, Steve came to me frustrated about getting committee agreement on a report and suggested that we set up a Design Research Center without a written report, thereby reflecting the majority opinion, and mine, that it looked too good not to try. So, in 1974 I did!

Later someone said, “one Herb had the ideas, the other Herb kicked as.” The ideas were definitely Herb Simon’s, but I don’t think much kicking was required, only nagging and perhaps a little bribery. (Angel Jordan, who I nagged to hire Steve Director soon became a strong supporter of the cause, but still thinks that it took some kicking). I remember establishing design research in CIT as a relatively easy sale; no big turf wars, lots of intellectually good use of Howard’s presence by recruiting valuable new faculty. Among the new faculty who were recruited in the 1960’s was Howard Brenner who joined the department in 1966 with a reputation in fundamental fluid mechanics. He not only brought his expertise and reputation to the department, but his presence helped signal the direction in which the department was moving, attracting additional faculty with similar mindsets. Tom Fort made good use of Howard’s presence by recruiting valuable new faculty. It was during that time that the Colloids, Polymers and Surface program started with Fennell Evans as the director while Ed Cussler, a fertile source of new ideas, initiated the New Alternatives Program.

In the early 1960’s a project course was set up in Chemical Engineering to look at environmental issues. This was run by Mike Massey, a chemical engineering graduate student who eventually joined the faculty as an instructor. This course produced the first decent Emissions Inventory for Allegheny County and became the model for future Engineering and Public Policy project courses that led to the formation of the EEP department in CIT.

When it became clear to that we had a winner in the Design Research Center, I asked Gary who was the best guy in Chemical Engineering in the field. He mentioned Art Westerberg so, I asked Tom to recruit Art which he did. I gave Tom credit for being a great recruiter, which he was, but as Art later told me, we got him here to a large extent because of the Barbara Westerberg’s attraction to the Pittsburgh Symphony. I probably increased Tom’s budget to get Art, but that was certainly a fine investment.

Then it was decided that we needed someone in Electrical Engineering and Art suggested Steve Director who had been at Florida when he was there. After some nagging Angel Jordan, then head of Electrical Engineering managed to bring him here; another good investment. A further payoff from Art was Ignacio Grossmann fresh from Imperial College, completing a stellar group of Chemical Engineers. Eventually, however, people from all CIT departments other than perhaps Metallurgy and Materials Science became involved in the design effort.

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Hauan, S., Ououa, I. “Distributed Modeling and Optimization of Enterprise Networks.”


Sholl, D.S., Rankin, R. “Chiral Separation and Randomization in Amino Acid Aldehydes on Cu Surfaces.”


Sholl, D.S., Rankin, R., “Chiral Separation and Randomization in Amino Acid Aldehydes on Cu Surfaces.”

Tilton, R.D., White, L., Matos, M. “Electrostatic Strategies for Mass Transport Control through Polyacrylamide Gels.”


White L.K., Tilton, R.D., Matos, M. “Electrostatic Strategies for Mass Transport Control through Polyacrylamide Gels.”


Ydstie, B.E., White, C. “Modeling and control of size distribution for fluidized bed slabs” decomposition.”

Ydstie, B.E., Garcia-Osorio, V. “Polarity-Based Control of Transport-Reaction Systems using 2-nd Law of Thermodynamics.”

Ydstie, B.E., Itohn, K. “Complex Networks: Stability, Control, and Optimality.”

Session Chairs: 
19th World Congress on Nanoscale and Nanoporous Materials and Applications 
Ydstie, T. PEP Division Chair 
Ydstie, B. PEP Division Chair 
Ydstie, B. PEP Division Chair 
Ydstie, B. PEP Division Chair
Special Lectures

Symposium to honor Professor Arthur Westerberg’s 65th Birthday

May 6, 2004 Singleton Room, Roberts Hall

Arthur Westerberg obtained his B.S. degree in chemical engineering at the University of Minnesota in 1960, M.S. degree at Princeton University in 1961, and his Ph.D. at Imperial College, London in 1964. He was one of the first Ph.D. students of Professor Roger Sargent with whom he pioneered the development of the program of SPEED-UP.

Art Westerberg’s 65th Celebration was highlighted by speakers from all over the country. In addition to Andy Gellman, Ignacio Grossmann, and Larry Biegler, other speakers from academia included George Stephanopoulos (MIT), Greg Stephanopoulos (MIT), Ed Csordas, (University of Minnesota), Jack Ponton, (University of Edinburgh), Hirokazu Nishitani, (Nara Institute of Science and Technology), G.V. Reklaitis (Purdue University), and Andy Hrymak (McMaster University). Jeff Sirola, from Eastman Chemical Company also presented a talk.

After the day’s events, cocktails and dinner were held in Art’s honor at the Monterey Bay Fish Grotto atop Mt. Washington. After the day’s events, cocktails and dinner were held in Art’s honor. President Cohon as well as former CIT Dean John Anderson were among the CMU celebrants along with Art’s wife Barbara and members of Art’s academic family and Art’s colleagues.

Professor Westerberg has been a pioneer in the area of computer-aided process design. He was one of the first researchers to provide scientific foundations for the areas of process simulation and optimization. He has been a pioneer in the areas of process synthesis and information modeling. Aside from basic theory, his work has been implemented in advanced computer software such as ASCEND for process modeling. SPLIT for synthesis of azotropic columns and n-vd for information modeling.

Carnegie Mellon has been most fortunate to have among its faculty such a distinguished scholar, teacher, mentor and researcher. We all join enthusiastically, to celebrate his 65th birthday and to wish him well on the occasion of his retirement.

Professor Westerberg has been the recipient of numerous honors and awards. He is a member of the National Academy of Engineering and a Fellow of the AIChE. He has received the ASEE Chemical Engineering Division Award in 1981, the Computers and Chemical Engineering Award in 1983, the William H. Walker Award of AIChE in 1987, the Institute Lecture in 1989, Founders Award in 1995, and the E.V. Murphee Award of ACS in 1997, the CIT Distinguished Professor Award in 2002 and the CACHE Award in 2003.

Bayer Lecture Series

The Chemical Engineering Department’s 2004 Bayer Lecture Series and Distinguished Research Lecture was presented by Professor Manfred Morari, of The Swiss Federal Institute of Technology on Tuesday, November 16, 2004 at 4:00 PM in the Singleton Room, Roberts Engineering Hall. His topic, the Hybrid Systems, was a personal account of the contributions process control has made to chemical engineering and the control field and some speculations about its future.

Department News

100 Years of Chemical Engineering at Carnegie Mellon

By Herb Tour

Chemical Practice was one of the original courses of study offered by the Carnegie Technical Schools when they opened their doors on Oct. 15, 1905. The program was offered at the time through the School of Applied Science.

The first head was Joseph James who lasted in that position until 1936, a tenure that is probably unbeatable. Originally the department housed Carnegie Tech’s activities in both chemical engineering and in chemistry. In 1936 the two disciplines diverged and Warren McCabe became head of the Department of Chemical Engineering with a faculty of five.

Roughly 50 years after Chemical Engineering started and almost twenty years after it separated from Chemistry there were 6 faculty members: Carl Monrad, Bob Beckmann, Bob Rothfus, Larry Canjar, Dave Archer and I. Dave and I joined at about the same time. It was a remarkably congenial group. Carl Monrad (1947-1965) had worked on the synthetic rubber program during the Second World War. He had recently succeeded the former head, Warren McCabe (1936-1947), and was a fine, old school boss. Dave was straight laced, Bob Rothfus had found religion and the rest of us enjoyed life. There was nothing here like the storied tales of faculty backbiting. The favorite was Larry Canjar, a 300 lb down-to-earth son of a Croat immigrant steelworker who went on an unplanned diet in a foxhole during the Battle of the Bulge.

In the 1950’s there were about as many undergraduate students as now (40 - 60 per class) but less than a quarter of the current number of graduate students or even less (10 or 15 in total). The undergraduates came from less affluent families than now. There were few, if any, women and many of the students were children of steelworkers. Teaching loads were higher; usually two courses a semester although some taught three at least one semester. Everyone was doing research except perhaps Carl Monrad, but it was done on the cheap using industrial grants or bootlegged department funds. At the time faculty weren’t expected to support graduate students who must have been supported by teaching assistantships and industrial fellowships.

It was clear by the mid-20th century that a lot of the ideas in chemical engineering, based as they were on empiricism and correlations, rested on weak foundations. More fundamental research was needed and indeed that began both here and elsewhere. This was part of the zeitgeist after the World War II which demonstrated the value of science and engineering and was reinforced by the subsequent rise of the National Science Foundation (NSF) which funded engineering science and became the primary source of academic research funds (significantly greater than the former industrial research funds).

Bird, Stewart and Lightfoot’s book Transport Phenomena published in 1960 introduced much new material into the curriculum and both broadened and deepened the move toward fundamentals. They brought these ideas to a wider audience and transformed chemical engineering, but it was the NSF which facilitated the transformation of chemical engineering at Carnegie Mellon and in the US at large. Increased student numbers and increased research funding as well as additional funding from government, industry and private foundations provided the resources needed to carry out the transformation.

After I became department head (1965 - 1970) we bought a house adjacent to the Schenley Park golf course and I frequently walked to the campus with Herb Simon whose path and time often coincided with mine. I found him a fascinating walking companion; full of interesting ideas and questions, and only long after we met did I find out that my fellow hiker was by then the famous Herb Simon who intimidated many people. Of course, by then I had been talking and arguing with him too long to be intimidated.

One day Herb said something like, “you engineers do a poor job of teaching design and my book, The Sciences of the Artificial will show you how to improve things.” I agreed about the problem; design, which is about synthesis, never fitted well into the increasingly analytical, engineering curriculum and it was not thought to be sufficiently scientifically rigorous or researchable to be taken seriously. It was not taught happily by most faculty.

If Herb Simon’s ideas could be put into practice it would make design respectable. Design would become intellectually respectable, something that could be a lodestar for academic engineers. This insight offered us the rare opportunity to be first in a new area. While I was still head, Herb Simon gave a seminar on the subject in Chemical Engineering but nothing much happened. Shortly before that CIT had missed out in a contest for Sloan Foundation funds to improve engineering design education. But funding wasn’t the problem, ideas were. I thought that we now might have them - but others need convincing and focusing was required.
In Memory of Ken Meyer
June 26, 1950 – August 9, 2004

Very unfortunately, Ken Meyer, who was foreman of the Department of Chemical Engineering machine shop, died in a plane crash this past summer on August 9, 2004. Ken and his nephew Quinn Peyton were flying a small plane back from California when their plane crashed near the continental divide in the Colorado Rockies.

Ken came to Carnegie Mellon in April, 1977 to join the department of Chemical Engineering as an ‘Instrument Maker’. At the time he held a BA in Physics and in Philosophy from the SUNY at Oswego and in 1982 he received an MSc degree in Physics from Carnegie Mellon. Since then he worked in the department of Chemical Engineering as a designer and fabricator of research and teaching instrumentation. Ken made some of the finest research instrumentation used in the department and created many such devices for other departments at Carnegie Mellon and for research programs at universities across the country. In recognition of his outstanding service to the university, Carnegie Mellon awarded Ken the 1996 Andy Award for Customer Satisfaction.

Ken was a man of many interests and talents which he applied to all manner of pursuits including dressage, piano, flying, ice hockey …. and the list goes on. He had informed opinions on any subject and loved to talk about anything with anyone. As he put it, he ran a ‘full-service shop’ providing everything from expert design capabilities to philosophical and political discourse. In addition, he was a connoisseur of fine single malt Scotch.

While we all valued Ken’s technical expertise, knowledge and professionalism very highly I think that everyone in the department appreciated Ken equally for the person he was. Outside the department (and sometimes inside) my own interaction with Ken centered on ice hockey which he took up a year after learning to skate at the age of 47. We would practice on Thursday mornings and then play in a local league in the evenings. Ken started knowing literally nothing about hockey but had no fear of trying. I remember having a very bad feeling when, on the way to our first game in the Senior League, he asked me to start explaining the rules. Of course, the rules weren’t really the major problem that night. Ken did get better though and managed to score his first goal in his first season.

As he always liked to point out, while his hockey career was clearly taking off, Wayne Gretsky’s was on the decline and that could only mean that one day …. ? I am sure that everyone who worked with Ken or interacted with him as a student has the same appreciation for the wonderful type of person he was.

In his memory, we have created the Ken Meyer Memorial Fund to establish the Ken Meyer Award to be given to one of our graduates at commencement each year.

Andy Gellman

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Department Update
A Message From the Department Head

Department Head’s Message

We have entered an important year in history of Chemical Engineering at Carnegie Mellon. On Oct. 15, 2005 the department will have been in existence for 100 years. Herb Tou, who has been here since 1952, has taken the time to put some of his recollections on paper for this issue of the ChemE Interface. In addition, many recent of the developments described in the following pages will have an impact on the next 100 years of the department's history.

One of the most important issues that we have struggled to address is that of identifying new space or a means to renovate Doherty Hall to accommodate modernization of the department’s research and teaching infrastructure. Planning and fundraising for this project will require a lot of attention over the next couple of years but everyone in the department is excited about the prospect. This decision paves the way for the growth and the continued improvement of the Chemical Engineering department into its second century.

Over the past year, there have been many very positive developments that are reported in this Newsletter.

Among other things we have hired a new Assistant Professor of Chemical Engineering, Dr. John Kitchin. John is currently a Humboldt Fellow at the Fritz-Haber Institute in Berlin and will be joining us in January 2006. Mr. James Meade and his wife have very generously agreed to create an endowment of $250,000 to support the Meade Graduate Fellowship. This will be instrumental in helping us attract even better graduate students to our PhD program. Support of this type is extremely valuable to the department as we have one of the largest PhD programs in the University. Last summer we managed to secure almost $1M in funding from the Health Resources Services Administration to be used to upgrade research equipment throughout the department. This has been enormously beneficial to many of the faculty as well as graduate students.

In his memory, we have created the Ken Meyer Memorial Fund to establish the Ken Meyer Award to be given to one of our graduates at commencement each year.

Andy Gellman