

Newsletter

Faculty of Applied Science
Chemical Engineering
Summer 2008



PUBLISHED !

Donald Woods,
(Alumnus 1957)

Donald Woods, Emeritus Professor from McMaster University and a Queen's alumnus (BSc, in ChemEng, 1957) has recently had two books published by Wiley-VCH (*Successful Trouble Shooting for Process Engineers, Rules of Thumb in Engineering Practice*). The first book details the principles of and skills used in trouble shooting while the second book provides rules of thumb for skills (such as problem solving, communication, performance review and team work) and for systems thinking. Don is well-known for his pioneering work in Problem-Based Learning.



~Dupuis Hall, 2008~

OUR ALUMNI FAMILY IS GROWING

Our success is measured by how well we prepare our current and future students to succeed in their lives. It is this sense of responsibility that drives us – **we are preparing tomorrow's engineers today**. Since our last newsletter in 2005, the department has welcomed over 280 students into our extended alumni family. Alumni and friends are key partners in our mission of delivering quality teaching and research. The legacy of Queen's Engineering is made possible by the generosity and commitment of those who know us best: our alumni, donors, and industry partners.

We are proud – and we are growing!

We have been on the road meeting with our alumni and friends from Halifax to Calgary and most points in between. We extend an open invitation to all alumni and friends to come visit us anytime. Come visit us for reunions and special events and speak to our students about your experiences: mentor them, coach them, recruit them! With over fifty alumni branches worldwide, we also encourage you to check out the Queen's activities happening in your city.

Message from the Head,

P. James McLellan



What do you say when you meet a friend on the street that you haven't seen for a long time? Such as it is with this newsletter – perhaps we could call it “The Sporadical” - with a promise to make it a regular newsletter. As you will see, a lot has happened in the three years since our last newsletter, and since the Centennial of the Chemical Engineering program. The Chemical Engineering program has grown dramatically – from combined enrolments across years 2 to 4 of 120 students five years ago, to 290 students currently. Engineering Chemistry enrolments have been steady over the same period, with a combined enrolment of 90 students, and we now have combined 380 students in both programs over years 2-4. The graduate student body has grown from 50 students to over 80 students, with roughly 50% of the graduate students pursuing doctorates, compared to 25% in 2003. And yes, we are bursting at the seams, and looking for new ways to add offices and laboratories. Our staff complement has grown by two with the addition of an additional Chemical Laboratory Technologist and an Instrumentation Manager. And last but certainly not least, our faculty complement has grown by four professors, including the new Dean of Applied Science, two new senior Canada Research Chairs in fuel cells and polymer reaction engineering, and an assistant professor in tissue engineering, a Lab/Projects Coordinator and our new T.E.A.M. Coordinator.

The Chemical Engineering department has always prided itself on its strong commitment to teaching and research, and its community spirit. With larger numbers, retaining a sense of community is more difficult, but the will is there nonetheless. And what accomplishments! Bill Newstead received the Charlie Baillie Teaching Award, which builds on his distinguished teaching career at Queen's.

You will find information on our award winning Faculty and Staff inside this newsletter, including the 2008 Syncrude Canada Award winner, several winners of the Golden Apple Award (issued by students in the Engineering Society) among our many accomplishments.

Our students have been busy, whether it is looking after their studies, serving as President of the Engineering Society, or taking part in expanded international exchange programs, such as through the Centennial International Exchange fund, generously donated by Jerry del Missier (ChemEng '85). Jerry himself is the President of Barclay's Capital, and recently moved to New York.

The fields of Chemical Engineering and Engineering Chemistry continue to evolve at an accelerating pace, whether it is developments in alternative energy, advanced materials and manufacturing, or biomedical engineering. Our ability to manipulate materials and characterize them at a microscopic, or dare say, nano-scale, has never been better. Our need to do this in a responsible manner, paying attention to the life cycle implications of our developments, has never been greater. However, the creativity of engineers to address societal problems and to find workable solutions keeps me optimistic. Look for future editions of this newsletter for stories about some of the fascinating research going on in the Chemical Engineering department.

Ultimately, our programs and department are about the people – undergraduate and graduate students past and present, staff, faculty – and you will see this spirit reflected in this issue. Some of the articles will give you a glimpse of current life in the department. Others will tell you about accomplishments of our graduates, staff and faculty. And still others will give you an idea of some of the research going on. The door is always open, and we welcome your visit, whether at Homecoming or if you are just passing through Kingston.

All the best,

Jim McLellan

NEW STAFF

We have been fortunate to welcome many new staff members in the past few years. They bring a diversity of experience and new faces to Chemical Engineering.



NEW STAFF:

(left to right)
Maureen Plunkett, Ashleigh Messenger, Kelly Sedore, Barbara Lawson, Lynn O'Malley and Paul Hiles

Missing: Liann Joannette, Andrea Liskova and Laurie Phillips

Paul Hiles is our Computer Systems Administrator taking over after the departure of Edward Fingland. His skill has kept the office computers in tip top order. He also manages the computer cluster, supports faculty computer systems and shares responsibility for the Applied Science central faculty server. We admire how he keeps smiling.

Liann Joannette took over the position of Undergraduate Program Assistant from Tina McKenna and works with Ted Grandmaison to keep the program running smoothly. With enrolment increasing yearly, it's a daunting task but Liann is more than capable and we appreciate the expertise she brings with her.

Barb Lawson replaced Karen McIntyre as the Graduate/Administrative Assistant in June 2007. Her duties range from supporting the Head to administering the graduate program under our graduate coordinator. Her background is as a research technician so she is used to juggling a lot of balls, which comes in handy in this position.

Andrea Liskova has assumed the Instrumentation Manager position and is our chief source for help in the labs. She obtained her PhD in chemistry in Belgium and came to Canada and held two post-doctoral fellows, one of which was here at Queen's. She now manages all training and instrumentation as well as implementing experimental protocols for the research

Lynn O'Malley became our Departmental Administrator in August 2007, coming from Sociology. She took over from Margaret Burns, who moved to the Faculty Office as the Financial and Operations Officer, Research Centres and Institute. Lynn's infectious enthusiasm and energy have brought a light to the main office that everyone benefits from. However, the world of Chemical Engineering is vastly different from her life in Social Sciences and has presented her with new challenges, which is exactly what she was hoping for in accepting the position.

Laurie Phillips became our Financial Assistant in 2006, taking over from Ann Tobin. Laurie has been very efficiently processing paperwork over the past two years but is temporarily leaving us for a new adventure, baby Clara born on June 18th. Congratulations and during her maternity leave we welcome **Ashleigh Messenger** to the team.

Maureen Plunkett is our Events Coordinator/Office Assistant. She puts together events such as Open House, Orientation, Convocation Reception and travel arrangements for TEAM. She is our ambassador for visiting professors and she is the keeper of keys. Her cheerful disposition and willingness to help is a welcome addition to the main office.

Kelly Sedore joined us in May 2007 as our second Chemical Technologist, working with Steve Hodgson. Kelly's top standing at Loyalist College made her the ideal choice and she has proved in a short period of time that she has what it takes to keep up with Steve. Kelly has continued her professional involvement at Loyalist, being on their Bio-Sciences Advisory Committee.



David Poirier is an alumnus who just could not stay away. After receiving his B.Sc. and M.Sc.E. at Queen's, he went on to work for the Queen's Fluidized Bed Combustion Pilot Plant Project and the Queen's Centre for Advanced Gas Combustion Technology. David then moved over to Mechanical and Materials Engineering as a Research Associate and returned to Chemical Engineering last summer as Undergraduate Laboratory and Projects Coordinator. Welcome back David!

David Mody, Adjunct Lecturer, joined the department in 2005. After graduating from Queen's with a B.Sc. in Engineering Chemistry and spending a summer in a pulp and paper company, he spent 17 years as a process engineer working for Fluor Corporation. Working for clients such as DuPont, Invista, Proctor and Gamble and others has left him with a range of engineering skills that encompasses design and safety in polymer processing, chemical plants, and utilities. David has gained experience in the field of engineering education by teaching courses for the Canadian Society of Chemical Engineers and EPIC. He works enthusiastically with our TEAM projects, CHEE470 and 3rd year design.



NEW ADJUNCT LECTURERS

Two new adjunct lecturers have returned to the department having both graduated from Queen's and worked in Industry.



Kimberly Woodhouse, Dean, Faculty of Applied Science, holds her appointment in Chemical Engineering, having come from the University of Toronto. Committed to education, industry and partnerships, Kim Woodhouse brings the kind of energy and enthusiasm to her new role as Dean of Applied Science. Her current research focuses on tissue engineering and regenerative medicine.

Tissue engineering holds great promise for the treatment of numerous diseases, disorders, and traumas. We are pleased to welcome **Lauren Flynn**, Assistant Professor, into our department. She brings youthful enthusiasm to her teaching and is pursuing her research in the areas of soft tissue engineering and regenerative medicine, natural biomaterials, adult



NEW FACULTY

We are pleased to welcome four new faculty members who bring with them new research areas and have subsequently expanded our graduate program.

Tim McKenna, Professor and Tier I Canada Research Chair, came to us from Ecole Supérieure de Chimie, Physique et Electronique de Lyon (CPE). His research interest in polymer reaction engineering runs from fundamentals to chemical engineering methods applied to polymers and further to experimentally-based modelling of polymerisations. Production of emulsions, mini-emulsions and other dispersed phase free radical polymers are additional areas of interest including fundamentals of particle growth, heat and mass transfer during olefin polymerisation on supported catalysts and polymer-based hy-



When it comes to fuel cell systems and research, **Brant Peppley**, Professor and Tier I Canada Research Chair is at the top of his field. He brings 21 years as a leading researcher in fuel cells and fuel cell systems, which includes scientific advisor to the Department of National Defence for a number of major fuel cell research contracts, project leader for the Ontario Fuel Cell Research and Innovation Network and a project leader in the AUTO21 Network of Centres of Excellence. Brant moved to Queen's to take up the Canada Research Chair in Fuel Cells in 2007, after working in the field since 1986. As the Director of the Queen's-RMC Fuel Cell Research Centre (FCRC), he is extremely dedicated to

NEW FACULTY RESEARCH PROFILES

See what we're up to!

Lauren Flynn joined us as an Assistant Professor in September 2007, after completing her doctoral work at the University of Toronto. Dr. Flynn's research interests pertain to soft tissue engineering, with a focus on natural biomaterials and the adult stem cell population that is found within human fat, termed adipose-derived stem cells (ASC). These cells, which can be stimulated to become mature fat, muscle, bone, neural, and cartilage cells, hold great promise for the development of new therapies to promote complete tissue regeneration. Dr. Flynn's research concentrates on the design of novel three-dimensional tissue substitutes incorporating the ASC, including tissue-engineered fat for use in the reconstruction of breast tissue following surgery to remove cancer, the repair of birth defects, or for the treatment of traumatic injuries and burns.

Timothy McKenna's research activities cover a broad range of topics with the central theme of polymer reaction engineering. Current projects include developing a process for improved paper coatings in collaboration with BASF (Ludwigshafen, Germany) tubular reactors for process intensification with CIBA (France) and proposals for projects on polymers from agro-source monomers, process safety via fault detection and isolation, as well as polyolefin reaction engineering. He also contributed to the establishment of the Macromolecular Product and Process Development group at Queen's. This group of ten engineers in Chemical Engineering represents what is probably the largest concentration of specialists in a single department in North America and covers the entire value chain in terms of polymer production.



Brant Peppley's background in fuel cell research and systems is exemplary. He has worked with numerous companies involved in the fuel cell industry including Hydrogenics, General Motors Global Alternative Power Centre, DaimlerChrysler, Motorola, and Dupont Canada. His current research activities include modelling of polymer electrolyte fuel cells and the development of new technologies for processing diesel fuel and bio-fuels for use in solid oxide fuel cells, hydrogen production for fuel-cell automobiles (Project Leader-AUTO21 NCE), Fuel cell component reliability and durability, development of novel membrane material for PEM fuel cell and fuel processing for fuel cells. As Director of the Queen's Fuel Cell Research Centre, Dr. Peppley oversees the projects of 20 post-docs and graduate students and is involved with industry in developing clean energy technologies.

Kimberly Woodhouse is an expert in the design of novel materials made from both synthetics and recombinant proteins. Besides her duties as Dean of Applied Science at Queen's, Dr Woodhouse holds an appointment as a Scientist at Sunnybrook Health Sciences Centre and is also the Associate Director of the Advanced Regenerative Tissue Engineering Centre, a multi-institutional centre to bring basic scientists, engineers and clinicians together to develop novel constructs for soft tissue engineering. She has considerable expertise in polyurethane development, the use of collagen and elastin based materials for tissue engineering scaffolds, and wound healing mechanisms associated with biomaterials. The main focus of her research is elastomeric materials for cardiovascular applications.

AWARDS & ACCOMPLISHMENTS

Striving for excellence!



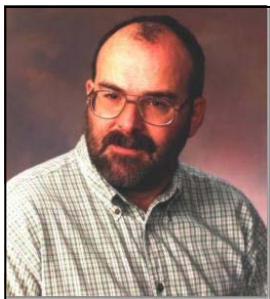
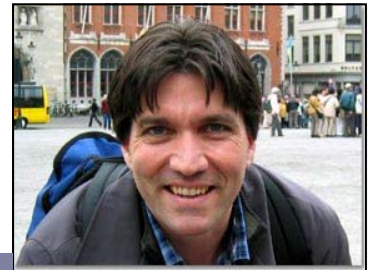
Brian Amsden was recently awarded a major Canada Foundation for Innovation grant for his project entitled "Biomimetic Materials for Tissue Engineering and Regeneration," which will develop biodegradable polymers that release medications to specific parts of the body. One of the targeted applications is to treat cardiovascular diseases.

Additional details on Brian's award can be found at: <http://www.innovation.ca/media/index.cfm> and in the Queen's Press Release: http://qnc.queensu.ca/story_loader.php?id=473c868c8d421

Martin Guay received the Syncrude Canada Innovation Award from the Canadian Society for Chemical Engineering. The award is given annually to a resident of Canada in recognition of their contributions to Chemical Engineering before the age of 40.

Martin joins Michael Cunningham in our department in receiving this award.

For more information go to: <http://www.chemeng.ca>



Steve Hodgson received a Special Staff Recognition Award for 2007, which was presented to him at the Principal's Reception. The Special Staff Recognition Award recognizes contributions to the learning and working environment that are significantly beyond what is usually expected and there is strong competition for these awards. Steve is a most deserving recipient! His nomination had very strong letters of support from graduate and undergraduate student representatives, faculty and staff.

Kunal Karan was one of seven Queen's professors awarded an Early Researcher Award (ERA) from the Province of Ontario in the Fall, 2007. These awards are given to junior faculty undertaking leading research to help build up their research teams. Kunal was awarded an ERA for his project entitled "Development of a low-cost fuel cell as an alternative energy technology."

For more information:

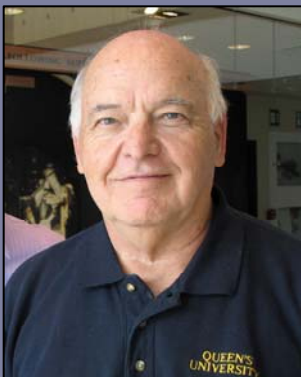
http://www.mri.gov.on.ca/english/news/Era081307_kingston_bd.asp



PARTEQ Innovations honoured Scott Parent among other inventors at their 20th birthday party last Fall. He was honoured with the Most Prolific Inventor award along with Dr. Michael Adams from the Pharmacology Department. The award was based on the number of patents filed by PARTEQ on behalf of researchers. Scott filed eight patents among these inventions; he developed new methods to chemically modify plastics through simple, environmentally friendly processes. Scott also created several new classes of synthetic elastomers that are showing promise in many consumer applications.

MORE AWARDS & ACCOMPLISHMENTS

Honouring our achievements!



Bill Newstead Wins Chancellor A. Charles Baillie Teaching Award

We are very proud of Bill Newstead (Chem Eng '68), who received the Chancellor A. Charles Baillie Teaching Award. From the award description, "this university-wide award recognizes undergraduate or graduate teaching that has had an outstanding influence on the quality of student learning at Queen's. It is awarded annually for activities that lead to improved learning, including curriculum development, educational leadership, design and delivery of out-of-classroom educational experiences, or classroom teaching and supervision."

Recipients for this award are nominated by peers, and are selected by an adjudication committee of peers. Bill is a force to be reckoned with in the teaching arena, captivating his students, and keeping them engaged throughout his lectures. Bill's love of things chemical is infectious, and his enthusiasm has been a major factor in the increased interest in Engineering Chemistry and Chemical Engineering amongst first year Applied Science students. Bill is also strongly committed to developing the teaching of others, and has organized and helped deliver workshops for instructors and teaching assistants.

Bill's success at Queen's follows on a distinguished teaching record in Kingston area high schools, notably at Frontenac Secondary School.

In addition to the Chancellor Baillie Award, Bill has won the Alumni Teaching Award for Excellence in Teaching (2003), the Frank Knox Award (highest award given by students - 2002-03), the First Year Teaching and Learning Award (4 times in the past 6 years), and a Golden Apple (2001-02). It is clear that Bill's love of things chemical is matched by a strong love of another discipline - teaching!

Golden Apple Awards

The Golden Apple Award was created in 1970 by the Engineering Society Development Committee as a means for undergraduate students to honour Faculty members. Nominees for the award should have demonstrated superior teaching abilities and concern for students on an individual level.

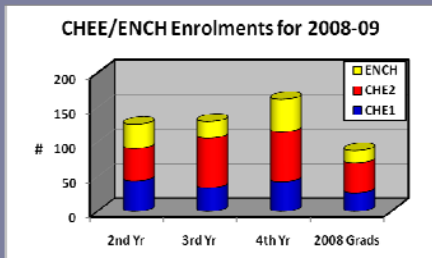
2004-2005 Kunal Karan
2004-2005 James McLellan

2005-2006 Martin Guay
2005-2006 Dave Mody

2007-2008 Kunal Karan

ENG CHEM NEWS ~ Scott Parent ~

Engineering Chemistry is an active program that saw 18 graduates this year alone; 88 when combined with CHE1 and CHE2 streams. Enrolment in the three streams has held from 2nd to 3rd to 4th years and we are pleased to see it has risen in recent years. We proudly maintain the accreditation of our programs through the Canadian Society of Chemistry and the Canadian Engineering Accreditation Board (CEAB). Fourth year thesis projects continue to be a keystone chemistry experience for all students and new core courses in Scale-up of Chemical Processes is helping students to learn how to elevate their knowledge of chemistry to meet industrial market needs.



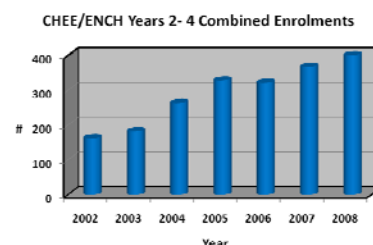
CHEM ENG NEWS ~ Ron Neufeld ~

Be careful what you wish for, because your wish may actually be answered. Historically, the Chemical Engineering (CHEE) program at Queen's has been undersubscribed in terms of undergraduate enrolments, relative to comparable departments in Canada. As a result, a number of steps have been taken by the department to address this situation, with surprising and strong results. The most significant step was the introduction of new option programs, starting in September, 2002. Students now select options in Biochemical Engineering (with Streams in Biochemical/Biomedical and in Environmental Engineering) and in Chemical Process Engineering - what has affectionately come to be known as "CHEE-classic".

Enthusiastic teaching from Bill Newstead in First Year Chemistry has kindled strong interest in Chem/Eng/Chem as well.

Changes were felt in the classroom, as we had grown comfortable with a class size of 50 students, but this presented new challenges with classes of 150 or larger. Changes were also felt in the corridors and on the streets, as it was increasingly difficult to recognize our own students. We have grown from a small department "where everybody knows your name", to one of the largest departments in Applied Science at Queen's.

Students have risen to the challenge by providing outstanding leadership, and by building community through organizing career and technical evenings, by closer coordination between the CHEE and ENCH clubs, by the organization of the annual attendance at CSCHE conference, and by means of the usual social and fun events such as the Chem-E -Car competition. The Faculty of Applied Science



has risen to the challenge by providing much needed growth in operating budgets, faculty and staff, as well as renovated space in Dupuis Hall, such as new undergraduate labs and administrative offices.

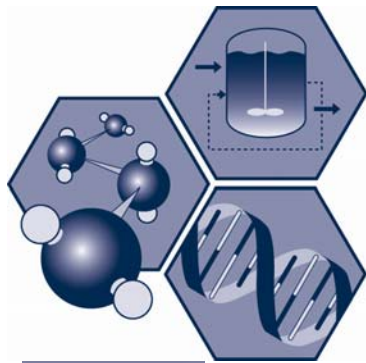
Enrolments projected for 2009/10 appear to indicate that the "blessing" of growth will continue, once again challenging us as a department and as faculty and staff to grow, and to continue to provide an outstanding educational experience for our students.

GRADUATE STUDIES NEWS ~ Mike Cunningham ~

Graduate studies continue to increase in popularity as more students seek to advance their qualifications by pursuing a Master's (M.Sc.) or Doctoral (Ph.D.) degree. The Chemical Engineering Department currently has over 80 registered graduate students, compared to 55 a decade ago. We anticipate having over 100 students within a few years as newly hired faculty members enlarge their research groups. Graduate education today presents new opportunities for students that have not been as accessible in past years, especially regarding international travel and exchanges. The Department has graduate students who have spent periods ranging from three months to a year in locales such as Zurich, Switzerland and Lyon, France as part of their doctoral research programs. Our students also benefit from having graduate students for other universities visit Queen's as members of their research group. Queen's Chemical Engineering has recently played host to students from Germany, Japan, Brazil and the Netherlands. We are pursuing initiatives to further promote opportunities for international exchanges as part of our graduate studies program.

Our graduate students received numerous prestigious awards last year, reflecting their high caliber; many awards are highly competitive. Seven NSERC (Natural Sciences and Engineering Research Council of Canada), six OGS (Ontario Graduate Scholarship), three OGSST (Ontario Graduate Scholarship in Science and Technology) and three McLaughlin awards (Queen's) are held by nearly 25% of our graduate students. Ph.D. student Nicolas Hudon was honoured with the Education Catalyst Award.

Congratulations to all award winners!



Undergraduate Events



2008 ChemECar Winners

(left to right)
Helen So, Patricia Yeung
and Nikki Apostolakis

The ChemECar competition began in 2004 and has been successful ever since. It is one of the fun spots in the year, watching various minicars designed by our own students race across the floor. They can make a mess as was the case this year with the diet coke and Mentos-powered vehicle. Regardless of the clean-up required after the event, everyone has a blast watching the cars zig, zag and sometimes peter out early.

PAST ChemECar WINNERS

2005 Stu Robinson & Kevin Tsang

Back to Back Winners 2006 & 2007 Gureet Chandhok, Tom Cooper, Emily Hanna & Gustav Johnson

STUDENT SUCCESSES – Convocation Awards 2008

Chemical Engineering

CHUNG, AUDREY

Paithouski Prize

GAUTIER, STEPHEN

B.E.C. Joyce Memorial Award

LEBEL, LUKE

University Medal and E.T. Sterne Prize

NORTHWOOD, JAMES E

The Michele Mainland Memorial Medal in Chemical Engineering

TURNER, ALLISON E B

Society of Chemical Industry Student Merit Award

VALIANT, ESTHER M

The Michele Mainland Graduating Scholarship in Chemical Engineering

Engineering Chemistry

CORKUM, LAUREN

L.A. Munro Award in Engineering Chemistry

EDWARDS, MICHELLE A

Dr. Wallace Graham Breck Memorial Prize in Engineering Chemistry & University Medal

KAMINO, BRETT

M. Sullivan and Son Limited Scholarship

LE NOBEL, GAVIN J

Society of Chemical Industry Student Merit Award

MARCOTTE, KEVIN T

L.A. Munro Award in Engineering Chemistry

MICHALOWICZ, SARAH M

H.G. Conn Award

PLEASE CHECK OUT OUR AWARD WINNERS FROM PREVIOUS YEARS AT:

<http://www.chemeng.queensu.ca/undergraduate/StudentAwardsandGrants.php>



Newsletter Feedback

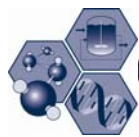
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Update your contact info at:
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click on "Update My Profile"

The Chemical Engineering Newsletter is a publication of the Department of Chemical Engineering, Queen's University, Kingston ON K7L 3N6. Its purpose is to provide news concerning faculty, staff and students in the department.

Newsworthy suggestions and comments are received at
newsletter@chee.queensu.ca

Newsletter Summer 2008



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