

FEBRUARY 3, 1983

THE QUALITY AND SUITABILITY OF ENGINEERING GRADUATES

OPENING REMARKS - P. LAPP

IT IS WITH A DEEP FEELING OF GRATITUDE THAT I WELCOME YOU HERE THIS EVENING, OFFICIALLY ON BEHALF OF APEO. I BELIEVE WE ARE ABOUT TO BEGIN A PROCESS OF IMMENSE IMPORTANCE TO THE ENGINEERING PROFESSION WHICH IN TURN, GIVEN TIME, CAN INURE TO THE BENEFIT OF OUR COUNTRY STRUGGLING AS IT IS TO RELEASE ITSELF FROM THE GRIPS OF THE WORST RECESSION SINCE THE 1930's. ENGINEERS ARE THE AGENTS OF CHANGE AND THE GENERATORS OF WEALTH - ANY PROCESS WHICH CAN EXPAND OR IMPROVE THE EFFECTIVENESS OF THE ENGINEER IN THESE TROUBLED TIMES SHOULD BE WORTH THE EFFORT AND THE VALUABLE TIME YOU ALL HAVE SO KINDLY MADE AVAILABLE FOR THIS SEMINAR. THUS I AM MOST GRATEFUL THAT YOU ARE HERE AND I ONLY HOPE THAT WE ALL WILL FIND THE EXERCISE, AND EXPERIMENT, WE ARE ABOUT TO UNDERTAKE WORTHWHILE AND MUTUALLY BENEFICIAL.

I WOULD LIKE TO TAKE A FEW MOMENTS TO FILL YOU IN ON THE BACKGROUND THAT MOTIVATED THIS SEMINAR. IT HAS BEEN AN APEO TRADITION - SOMETIMES MORE HONORED IN THE BREACH THAN IN THE OBSERVANCE - FOR EACH INCOMING PRESIDENT TO UNDERTAKE SOME NEW PROJECT OR DEPARTURE DURING HIS TERM OF OFFICE. IN TURN, COUNCIL AND STAFF HAVE INDULGED HIS WHIM IN THE FOND HOPE THAT IT WILL KEEP THE PRESIDENT BUSY DURING THE YEAR AND WILL NOT UNDULY DISTURB THE SMOOTH FLOW OF DAILY ASSOCIATION BUSINESS.

FOR SOME TIME NOW, I HAVE BEEN CONCERNED ABOUT THE PROCESS WHEREBY WE EDUCATE AND EXAMINE YOUNG PEOPLE, REQUIRE THEM TO GAIN CERTAIN ACCEPTABLE TYPES OF EXPERIENCE, AND MORE RECENTLY EXAMINE THEM FOR THEIR KNOWLEDGE OF THE PROFESSION ITSELF AND THEN REGISTER THEM AS PROFESSIONAL ENGINEERS. THE FRENCH HAVE A GOOD NAME FOR IT - THE "FORMATION" OF AN ENGINEER. THE APEO AND ITS SISTER ORGANIZATIONS ACROSS CANADA APPLY UNIFORM CRITERIA TO ENGINEERING PROGRAMS THROUGH AN ACCREDITATION PROCESS OPERATED UNDER THE AEGIS OF THE CANADIAN COUNCIL OF PROFESSIONAL ENGINEERS BY THE CANADIAN ACCREDITATION BOARD (CAB). CAB ACCREDITATION CRITERIA WHICH, BY AND LARGE, ESTABLISH AND MAINTAIN THE STRUCTURE OF ENGINEERING PROGRAMS IN UNIVERSITIES ACROSS CANADA, ARE SET BY THE BOARD ITSELF WHICH, WHILE MAINTAINING SOME INDUSTRIAL REPRESENTATION, MAINLY CONSISTS OF ACADEMICS. THIS IN ITSELF I CONSIDER TO BE ESSENTIAL FOR, AFTER ALL, THE BOARD DEALS ALMOST EXCLUSIVELY WITH ACADEMIC ISSUES. MOREOVER, ACCREDITATION CRITERIA EVOLVE VERY SLOWLY AND GENERALLY REPRESENT, A CONSENSAL VIEW OF A BROAD RANGE OF ENGINEERS - ADMITTEDLY MOST OF THEM FROM ACADEME.

WHAT DOES CONCERN ME, HOWEVER, IS THAT THERE ARE NO MECHANISMS IN PLACE WHEREIN THOSE THAT SET CRITERIA AND JUDGE ENGINEERING PROGRAMS CAN OBTAIN FEEDBACK FROM THE ULTIMATE USERS OF ENGINEERS AS TO THE SUITABILITY OF THE END PRODUCT. THOSE OF YOU FROM THE CONTROL FIELD WILL RECOGNIZE THIS AS "CLOSING THE LOOP".

WHAT I HAVE SAID ABOUT ENGINEERING EDUCATION PROGRAMS CAN BE SAID EQUALLY ABOUT THE EXPERIENCE COMPONENT. WE REQUIRE TWO YEARS OF EXPERIENCE AT THE PROFESSIONAL LEVEL BEFORE REGISTRATION AS A P.ENG. THERE MAY BE DESIRABLE COMPONENTS OF THAT EXPERIENCE THAT SHOULD BE INTRODUCED INTO THE FORMATION PROCESS. WE ARE PRESENTLY EXPERIMENTING WITH A BETTER SYSTEM OF KEEPING TRACK OF THIS EXPERIENCE ELEMENT OF THE REQUIREMENTS FOR REGISTRATION WHICH WOULD ALLOW US TO IMPOSE SPECIFIC CONDITIONS IF INDEED THEY APPEAR TO BE DESIRABLE.

FOR THOSE OF YOU THAT ARE INTERESTED IN THE CAB ACCREDITATION CRITERIA, WE HAVE COPIES OF THE CAB ANNUAL REPORT FOR EACH DISCUSSION GROUP. SLIDE 1

I THOUGHT IT MIGHT BE HELPFUL TO SHOW YOU AN OVERVIEW OF OUR ADMISSIONS PROCESS WHICH MIGHT HELP TO PLACE IN PERSPECTIVE WHAT I HAVE SAID ABOUT REQUIREMENTS FOR REGISTRATION. SLIDE 2

INCREASINGLY, ENGINEERS ARE BEING CALLED UPON TO UNDERTAKE MANAGEMENT ROLES AT AN EARLY STAGE IN THEIR CAREERS. MANAGEMENT INVOLVES LEADERSHIP. HOW DO YOU TEACH THAT AT SCHOOL? MANY ENGINEERS HAVE SUCCESSFULLY MADE THE TRANSITION FROM EMPLOYEE TO EMPLOYER OR MANAGER, AND TODAY HEAD ENTERPRISES OF CONSIDERABLE IMPORTANCE. OTHERS HAVE BEEN LESS SUCCESSFUL.

A STUDY I DID IN 1972 SHOWED THAT WHILE MOST ENGINEERING GRADUATES START IN NON-SUPERVISORY, TECHNICAL JOBS, WITHIN 10 YEARS OVER TWO-THIRDS MOVE INTO SUPERVISORY, MANAGEMENT OR EXECUTIVE POSITIONS.

MANY COMPANIES SAY THEY HIRE ENGINEERS FOR MANAGEMENT AND THAT A MEASURE OF SUCCESS IS BASED ON THE ENGINEER'S ABILITY TO ACHIEVE MANAGEMENT STATUS. LEADERSHIP IS A BASIC REQUIREMENT FOR MANAGEMENT - THE BEST METHOD OF ACQUIRING IT, UNLESS IT IS AN INNATE CHARACTERISTIC, IS LESS CERTAIN.

I DON'T HAVE TO REMIND YOU OF THE RAPID PACE OF TECHNOLOGICAL CHANGE AND HOW QUICKLY OBSOLESCENCE CAN OVERTAKE US. THE "HALF-LIFE" OF AN ENGINEERING CURRICULUM TODAY HAS BEEN ESTIMATED AS ABOUT 5 YEARS (HALF THE COURSE MATERIAL WILL BE OBSOLETE IN 5 YEARS).

PERHAPS THE MOST STARTLING AND YET SUBTLE CHANGE OVER THE PAST DECADE IS THE INVASION OF THE MICROPROCESSOR CHIP INTO OUR LIVES. IT CAN BE FOUND EVERYWHERE - IN EVERY ROOM IN YOUR HOUSE (YES EVEN THE BATHROOM IF YOU HAVE ELECTRONIC SCALES), IN THE OFFICE AND FACTORY - EVERYWHERE. WHAT'S MORE IMPORTANT IS THAT THE CHIP IS CREATING STRUCTURAL CHANGES TO OUR EMPLOYMENT PATTERNS LEADING TO THE NEW IN-TERM "TECHNOLOGICALLY UNEMPLOYED".

IN THINKING ABOUT THIS "CHIP" REVOLUTION THAT IS OCCURRING, I BELIEVE THE ENGINEER HAS A MAJOR RESPONSIBILITY. THE CHIP UNDOUBTEDLY CAN AND WILL CONTRIBUTE TO OUR PRODUCTIVITY AS AN INDUSTRIAL AND EXPORTING NATION. THUS WHILE THE CHIP IS CREATING UNEMPLOYMENT PRINCIPALLY IN THE SERVICE SECTOR, IT SHOULD BE CONTRIBUTING TO OUR OVERALL OUTPUT SUFFICIENTLY TO

RE-ABSORB APPROPRIATELY TRAINED WORKERS IN ALL SEGMENTS OF THE ECONOMY.

THE CHIP IS INVADING ALL WALKS OF ENGINEERING - AND ON AN INTERNATIONAL SCALE. IT WILL HAVE AN IMPACT ON VIRTUALLY ALL NEW PRODUCTS OF THE 1980s, AND EVEN ON THE DESIGN PROCESS ITSELF - FOR EXAMPLE, THE RAPID EVOLUTION OF CAD/CAM AND ROBOTICS TECHNOLOGY. IN MY OPINION, THE PROFESSION NEEDS TO RECOGNIZE THIS REVOLUTION, EMBRACE MICROELECTRONICS TO THE FULLEST EXTENT, AND INCULCATE THE NECESSARY KNOWLEDGE AND AWARENESS AMONG OUR BUDDING ENGINEERS DURING THE "FORMATION" PROCESS. I INTEND TO SAY MORE ABOUT THIS SUBJECT EDITORIALY OVER THE NEXT FEW WEEKS.

TOMORROW, WE NEED TO FACE A NUMBER OF QUESTIONS. IS OUR TRAINING OF ENGINEERS ADEQUATE TO MEET NEW TECHNOLOGICAL DEMANDS? HOW DIVERSE CAN IT BE WITHOUT BEING SUPERFICIAL? CAN WE THROW THE MAIN RESPONSIBILITY ON OUR ENGINEERING SCHOOLS? OR MUST THE PROFESSION, THROUGH ITS GOVERNING BODIES, PLAY A LARGER ROLE? WHAT IS THE FUNCTION OF INDUSTRY IN THIS RESPECT? ARE EMPLOYERS MAKING THE MOST EFFECTIVE USE OF ENGINEERS AND HOW CAN THEY DO A BETTER JOB?

THESE ARE SOME OF THE QUESTIONS TO WHICH WE ARE SEEKING ANSWERS AT THIS SEMINAR, AS WELL AS THE LARGER ONE OF MEETING USER NEEDS. OFTEN WHEN WE THINK WE HAVE FOUND THE ANSWERS, THE QUESTIONS CHANGE.

IN EXERCISING MY PRESIDENTIAL PEROGATIVE TO UNDERTAKE A PROJECT WHICH I BELIEVE TO BE OF BENEFIT TO THE PROFESSIONAL AND THE PUBLIC, I AM AWARE THAT SOLUTIONS CANNOT BE FOUND IN ISOLATION, THERE HAS TO BE AN EXCHANGE OF INFORMATION, WE HAVE TO SEEK THE VIEWS OF OTHERS, ESPECIALLY OUR CLIENTS, THOSE WHO USE OUR SERVICES.

THE LARGEST PERCENTAGE OF OUR MEMBERS WORK IN INDUSTRY, AND INDUSTRY IS THE LIFE BLOOD OF OUR ECONOMY. UPON IT DEPENDS THE MAINTENANCE OF CANADA'S POSITION AS A WORLD TRADING NATION. IT IS APPROPRIATE THAT WE SHOULD GET TOGETHER, THE PROFESSION AND EMPLOYERS, AND DISCUSS OUR RELATIONSHIP--WHAT YOU REQUIRE OF US AND WHAT WE LOOK TO FROM YOU.

AT THE BEGINNING I REFERRED TO THE NOTION THAT WHAT WE ARE ABOUT TO EMBARK ON TOMORROW IS IN THE NATURE OF AN EXPERIMENT AND THE START OF A PROCESS. I AM CONVINCED THAT WE MUST ARRIVE AT SOME FORM OF FEEDBACK PROCESS FROM THE USERS OF ENGINEERS AND BELIEVE THAT WE COULD FIND NO BETTER PERSON THAN GORDON McHENRY TO LEAD US THROUGH OUR "EXPERIMENT". I AM GRATEFUL TO GORDON FOR THE TIME AND EFFORT HE HAS PUT IN ON OUR BEHALF AND AGAIN THANK YOU FOR ATTENDING. I LOOK FORWARD TO SOME MUTUALLY BENEFICIAL RESULTS FLOWING FROM OUR DISCUSSIONS.