

## Reprint

# Why are engineers reactionary?

The author, managing editor of the University of Waterloo *Chevron*, was a student in civil engineering until this summer when he did not write his second term exams. He is presently on academic sabbatical.

By BOB VERDUN

Why are engineers as a group so defensive? Why are engineers so protective of the status-quo?

Particularly, why are engineers so opposed to participatory democracy ideals of the new left, even as this extends to unions?

Engineers have always been typecast on most Canadian and American campuses as having the characteristics questioned above. Much of this applies to students in other technical-based programs like math and science, but the engineer's situation is usually the most blatant and the experience is closest to the author.

The first-year student entering engineering is a confused impressionable individual, but within a week of registration, he's on the way down a path to being a disillusioned, reactionary member of a class.

Conjecture a model of the typical freshman engineer. He took math and science in grade 13 because it was less complicated to him than the so-called arts high school subjects. He's from a slightly lower socio-economic level than the average freshman and seeks a higher level. He's very unsure of what an engineer actually does. His concept of the engineering rough-time, don't-give-a-damn attitude is only based on hearsay and is probably overplayed. He apparently believes engineers are important people in a technological society that confuses him. He abhors artsy things because he doesn't understand them - writing essays seems more difficult than mechanical problem-solving because he lacks confidence and abstract conceptual ability.

All this is reinforced by the first contact with the university. The calendar is remarkably simple in its coverage of engineering. The freshman engineer registers in courses without scheduling problems because his entire timetable is preset - usually without any electives in the first year. The engineering society is there to meet him with a whole package-deal of communal spirit and a promise of fun.

Other examples of simplicity in the engineer's status-quo even include buying books from a definite list of required materials (and the bookstore conveniently has all that he needs and more all within easy reach); and of course industrial work assignments - spoon-feeding from the co-ordination department and the promise of a physically-easy job with higher pay than an artsman can get - are hard to find fault with, although in later years the engineering student usually becomes very critical of the paternalizing and relative economic exploitation of the co-operative program.

## SO PUT DOWN, IT LOOKS LIKE UP

In all this, the freshman engineer hears a lot about a put-down society but he can't relate to it because he is so much better off than the seemingly-bewildered artsies who struggle with things like scheduling, textbooks and summer jobs. He may dismiss the surface romanticism of subjects like psychology, sociology, philosophy and those other groovy-sounding things - yet he himself probably yearns to dabble a little in them. But the restrictive walls of his new class solidify around him, and when he finally takes an arts elective, the course is so emasculated he becomes completely estranged - the content is usually of little relevance - even less relevant than the average arts-course content - and the prof for the course is the one who lost out drawing lots in his department. It's all too little and too late.

There is one other significant development in the assimilation of a freshmen engineer - he walks into his first class (usually of about 300 people) and instead of feeling the alienation of being lost in the crowd, he is encouraged to revel in the fraternal

spirit of being an engineer in a key class of the technocratic society.

That's the way the reactionary engineer gets his start. Similarly throughout his so-called education, the status-quo is emphasized, enhanced and reinforced.

## PROFICIENCY IN FUTILITY

Engineering training is the farthest from the search for truth concept traditionally associated with university. Defined as applied science, engineering instruction tends to take theoretical work as a given and proceed from there in problem-solving. This lack of emphasis on developing formulae leaves more time for what is considered useful work. But many of the problem-solving courses have no relevant application to physical use in engineering. Professors will admit this, saying the object of the course is to make students more proficient in problem-solving - which seems like proficiency in futility. Many engineering students admit this but fail to see how the irrelevance of some of their courses will extend to similar irrelevance of later employment.

While they may accept the meaningless content, most engineering students love restrictive instruction methods. Seminars are abhorred as too much work, and problem assignments are just the thing to get through the course with the minimum work - just do the assignments and then cram for the final quiz.

Labs are usually completed as just another drudge with a correct answer expected and a report to be done where appearance is more important than content. Creative work in labs is non-existent.

## NUMBERS THAT REALLY COUNT

The only thing that counts in a course is the mark received. This was blatantly shown this summer when the civil-2B class insisted on at least knowing their numerical rank in the class since no complete formal-exam and release-of-marks procedure had taken place in their 2A term.

The scramble for marks - or at least rank - takes on its proper perspective when it is realized many employers announce to their newly-acquired engineering graduates, "Forget everything you ever learned in university. Your degree only proves you can complete what you're told."

## REFORM OR REVOLUTION NEEDED

This we all know, and by no means are these all the congenital deficiencies of engineering. The question to be faced is the extent of the malady and whether the plodding reforms now taking place are enough or whether a revolutionary change is necessary.

Examine the engineering student in his later years. He senses something wrong in the paternalistic co-operative program, the lack of real design work for engineers and the failure of the engineering profession to take a lead in reform in the society.

It remains only a felt need - he cannot define it - because his education has not encouraged or provided the opportunity or ability to articulate and define abstract concepts. He has had no experience or teaching in the area of searching out and evaluating alternatives - other than selecting the best combination of design and materials to meet a certain budgetary requirement and provide a defined physical facility.

## MOM'S APPLE PIE MYTHS

Basically unable to cope mentally with the socio-political changes he feels are needed, the engineer retrenches his reactionism and clings desperately to what points of reference he has. Uneducated in the ways power functions in our society, he continues to place what little political hope he still has in the myths learned in highschool - the upward mobility provided by the so-called equal-opportunity educational system, the free-market function for the fair operation of the capitalist economic system, the

effectiveness of political-party-dominated representative democracy, and the cure-all of society's ills by technical improvement.

Some will see through the myths and realize the uselessness of their engineering instruction in enabling them to deal with society. But to change their course of action now would mean admitting two or more wasted years - and restarting with younger people in arts courses that are by no means totally useful and relevant in their strictest context anyway.

Instead we have the phenomenon of engineering students decrying those who want radical change now, resolving themselves to stick with their course of action, and planning to be leaders of reform after graduation. It's the almost-cliche struggle-cycle they adopt: suffer through one stage to reach a position of power. But this is a fallacy, for the strictly-controlled environment of elementary school gives way to the mindless, disciplined high school situation, which in turn yields to course-structured, top-down corporate control of the universities. It doesn't stop there. Graduate engineers fill a powerless technocratic or bureaucratic function in industry, although many may finally make it to management but never to the real level of control in the boardroom.

Engineers especially are frustrated in their powerlessness after graduation, for their corporate-controlled professional association has no semblance of a union, and they suffer from an exploitation greater than the working class.

## ARTS PROFS WHO BUILD BRIDGES

And yet while they finish their last two or so years in engineering, the students cling desperately to what they have. They follow, as it were, their professors who pretend to know history, sociology and politics and even try to teach courses in these areas themselves. These instructors left such subjects at the grade-12 level and can be effectively challenged by a second-year arts major. It's about the same as a situation where an arts professor pretends to know the dynamics of building bridges because he's driven over them for twenty years.

Their own self-centeredness prevents engineers as a group from realizing the need for drastic change in society. And they feel those who want the drastic changes want to replace technology as well as capitalism. They feel personally threatened and defensively blind themselves to the real conditions.

## HUMANE TECHNOLOGY IS DEMANDED

There is no way this society can do without technology. The concept raised by the critics who seek alternative systems is the beneficial, productive and, most important, humane applications of technology. There is something seriously wrong with a world society that in just one year (1965) spent \$180 billion on armaments - thirty times the amount experts say is needed to break the back of world illiteracy. Someone, sometime is going to have to stop the use of productivity to kill (and the accumulation of profit from it).

Still more humane issues of naplam, and starving children in underprivileged countries, are usually greeted with criticism for those who bring to the doorstep such conscience-troubling topics. Somehow our society is able to tolerate at a distance something it doesn't have on its doorstep.

## PLANNED PROFIT PRESERVATION

The same reasoning must be applied as well to planned obsolescence of such things as cars and appliances. This is a game played by capitalists for profit that not only perverts the design capabilities of engineers, creates an inflationary economy and misdirects the system's productive capacity, but also preserves the control of the society in a small, but very powerful, corporate elite.

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That is where the society stands with respect to the engineer. Our way of life is committed to technology, but if man and technology are to co-exist in any humane system, the engineer has an extremely significant and important part to play.

The engineer, however, will only be as valuable as his desire for change, and his perceived degree of necessary change, is radical.

This is a challenge engineers must answer with more than a hurled invective. To say "if you don't like it, get out" is not a sufficient reply this time.