

Political interest again

This year's elections for Arts Rep. on the Student Council were an excellent indication of the possible revitalization of political interest on our campus. With seven candidates to choose from, the Arts Faculty had the perfect opportunity to choose strength and commitment as well as a clear voice to represent it on Council.

I would like to congratulate Mr. Reynolds and Mr. McKenzie on their victory last Friday. They set forth an interesting platform and they now have the chance to achieve their goals. They have my support and help in the upcoming year in order to help attain that which is possible.

Most of all I would like to thank all of those students who gave me their support. To those

students who nominated me, and those who voted for me I tell you we did "all right." To those who helped on the campaign, making and re-making banners it could not have been done without you.

In entering this campaign I had only one goal in mind and that was to give the Arts Faculty the representation it needs on Council and on campus. As a candidate for election I was allowed a specified amount of funds to campaign with to be reimbursed to me by the Students' Union. I would like to donate the amount back to the Union as a member of the Union from the Arts Faculty.

Once again, congratulations go out to the winners.

Greg Schmidt

Jackson's commercial again

A few of my friends (yes, I do have some!) are wondering what I'll do about the recent letters in *Gateway* questioning my identity and mental competence. My identity is not that of a 'typical' Commerce student. I don't believe there is a typical image for Commerce. What you deem to be typical is a product of your mind, Joe. Real Commerce students are as different and varied as people tend to be - a 'typical' human trait.

Joe, I am not going to claim I'm a genius but I'm no cretin either. I am concerned though that 'this type' of attitude is prevalent within our faculty. If only one student out of two thousand cares, then I would appreciate that you (whether you're fictitious or not) would help to turn the tide rather than

maintain the status quo. Other students have expressed a desire to help in any small or large way they can. They have shown willingness to work for something they feel is worthwhile. Perhaps that's not 'typical' of what you think a Commerce student would do?

Ken Jackson
Incoming President
Business Administration and
Commerce Undergraduate
Society

P.S. I might add Joe that you and all the other 'typical' Commerce students are members of BACUS and if you feel so inclined you can reach us at 432-1454 or in CAB 329 and talk about what we can do for you and how you can help us do it.

Ten forty-three.
In exactly TWO MINUTES
I'll ring the
FIRST BELL and
they'll all
stand still!



All, that is, except
your potential DEVIATE!
Your fledgling REBEL!
Your incipient BOAT-
ROCKER! THEY'LL try
to move all right!
THEY'LL have to
learn the HARD
way not to move!



So I'll SCREAM at 'em
and take their NAMES
and give them FIVE
DEPENTIONS and EXTRA
HOMEWORK! NEXT time
they won't move
after the first
bell!



Because when they've
learned not to question
the FIRST BELL, they'll
learn not to question
their TEXTS! Their
TEACHERS! Their
COURSES!
EXAMINATIONS!



They'll grow up to accept
TAXES! HOUSING DEVELOP-
MENTS! INSURANCE! WAR!
MEN ON THE MOON! LIQUOR!
LAWS! POLITICAL SPEECHES!
PARKING METERS!
TELEVISION!
FUNERALS!



Non-movement
after
the first
bell is
the
backbone
of Western
democracy.



Turn of the century madness

by Ken Larsen

The turn of the century is now a mere 24 years away. It is interesting to speculate on the type of things from NOW that will be pertinent THEN. One legacy we need not speculate on, however, has to do with one of our more elaborate solutions to the so-called energy crisis: nuclear fission power stations.

By the spring of 1974, the United States had 42 operational nuclear fission plants with 80 more under construction. Canada currently has 7 plants producing about 12% of Ontario's electric needs. The major difference between the U.S. and Canadian-designed plants is that the U.S. design uses ordinary water as a moderator, the "CANDU" (Canadian) reactor uses heavy water (deuterium oxide). Consequently, U.S. reactors must use uranium which has been "enriched" in fissionable U 235, while the CANDU can use natural uranium (U 238). Both types of reactors produce three things: 1) electricity, 2) heat (a 3,000 megawatt CANDU uses 6 million gallons of water a minute for cooling), and 3) what are rather blandly termed — "radioactive wastes."¹

These wastes fall into two categories. One: "fission products," formed from uranium and plutonium, and two: "actinides," which include actinium, thorium, uranium, and most importantly plutonium 239.

The main fission products consist of strontium 90, cesium 137, iodine 131, and krypton 85, all of which are lethal for 700 years. The actinides are very much more toxic and remain lethal for about 500,000 years. These two groups are chemically separated and the uranium is re-cycled as fuel and the plutonium is usually sold for use in atomic bombs or stockpiled.² The remaining liquid is highly radioactive — it boils on its own. Over 50 million gallons of these actinide wastes were stored in Hanford, Washington as of 1973.

The main fission products, strontium 90 and cesium 137, are of interest because both are what might be termed biologically active, that is, they are physically integrated into the food chains. At each level of the food chain these fission products are concentrated. For example, cesium 137, when introduced into a marine food chain, is concentrated by a factor of 1,000 by the time it is part of the fish. Assuming a level of cesium 137 considered "safe" by the U.S. Atomic Energy Commission in 1973, it has been found that a man eating one pound of such fish a week would receive a yearly dose of 15 "rems." (A "rem" or "roentgen equivalent man" is a measure of energy of radiation absorbed per gram of human tissue.)³ The pre-1945 "background radiation level" is .01 rems. A fatal dosage is about 600 roentgens

over the entire body.

Iodine 131 is also subject to this process and is found in milk. A child drinking one quart of milk each day from a cow in a pasture exposed to these 1973 "safe" levels would receive a phenomenal 2500 rems a year.⁴ Not to worry however, our collective dosage so far from the 375 atmospheric nuclear tests carried out since 1945 has amounted to some 4 million per year.⁵

Secondly, radioactive pollutants will never break-down ("never" in practical terms; the products will break-down in seven centuries or fourteen generations of man). With the projected increase of conventional fission plants in the future, we can expect our known uranium reserves to be exhausted shortly after 2000 A.D.⁶ The breeder reactor essentially compounds the problems of waste storage. Is the short term gain in terms of energy generated worth the immediate and long-term risks of contamination?

With an active life of 700 years, this is not a representative sample of things to come. According to a study on "DDT Movement in the Global Environment," it took over twenty years for the applied chemical (DDT) to move to the top of the food chains; authorities agree that strontium, cesium and other biologically-active radioisotopes would behave in a similar fashion.⁷

This brings us to the assumption that dilution of such wastes will keep concentration levels "safe." There are at least two things wrong with this: firstly, as our demand for power increases geometrically, the use of nuclear fission stations will also increase and thus, at some point we will reach a saturation level.

As was mentioned, in addition to fission products vented into the atmosphere and directly taken into the food chains, there is a huge amount of fission products produced as waste. After the plutonium and uranium are separated from the actinides, the remaining, highly-volatile wastes must be stored in absolute isolation from the living environment for 500,000 years.

The present solution is to use refrigerated steel tanks — hardly a long term solution. The "final solution" proposed by the A.E.E. is to distil this waste down into glassite blocks (basically, blocks of compressed radioactive dust) and then find a spot on the earth that will remain dry and geologically inactive (only the Canadian Shield has remained inactive (aside from frequent meteor strikes) for a suitable period, but that offers no guarantee for the future. The absurdity of this hope only pales when one considers the danger involved. According to an October 1975 bulletin from the American Association for the Advancement of Science, the U.S. Geological Survey is still searching for a suitable site.

Remember, however, there is already a considerable amount of the wastes in storage. The Hanford, Wash. facility (one of three in the continental U.S.) contains about 10 billion curies of radiation — fatal doses are measures in millionths of a curie.⁸ Similar amounts are stored by Russia, France and other Nuclear powers.

One last problem ought to be aired. Given the potential use of plutonium as a blackmail weapon ("do as I say or my friend will dump a vial of plutonium on your city"), not to mention the very real possibility of making atomic bombs with the stuff (e.g. India) — how much security will be necessary as production levels increase over the next 15 years? The handling of nuclear fuel and wastes so far have been largely left in the hands of business men and the story reads like a macabre Buster Keaton Movie.⁹

The handling of nuclear power plants themselves also leaves much to be desired. The Tennessee Valley Authority runs a station at Browns Ferry; while using a candle to check for air leaks, a fire was accidentally set to the polyurethane caulking material around a control cable. This caused all five of the emergency core cooling systems (designed to prevent a "melt down") to fail. Two days later the same thing happened again.¹⁰ "To err is human."

Lastly: there is nowhere to run. Radioactive elements, once released, are distributed throughout the biosphere — some physically but many, strontium, cesium, phosphorous, iodine and carbon 14, taken up in the food chains. We are at the top of those systems. The emigration office for Mars will be a long time coming. As one sign at an English anti-nuclear protest last year said: "Be active now or radioactive later." Canada is at present busily selling CANDU reactors to Argentina, South Korea and other such "calm" areas of the world.

Science fiction anyone?

FOOTNOTES:

- Rowland, Wade. *Fuelling Canada's Future*.
- Science*, 21, Dec. 1973: "Disposal of Nuclear Wastes," Kubo & Rose.
- Dasmann, R. *The Conservation Alternative*.
- Giddings, J. C. *Chemistry, Man & Environmental Change*.
- Rowland, W. *Op. Cit.*
- Rowland, W. *Op. Cit.* Giddings, *Op. Cit.*
- Randers, Jorgen. "DDT Movement in the Global Environment" from *Towards Global Equilibrium*, edited by D. Meadows.
- Giddings, *Op. Cit.*
- Curtis, R. & Hogan E. *Perils of The Peaceful Atom*.
- Undercurrents*: "Not so brief candle" Sept.-Oct. 1975.