CONFIDENTIAL REPORT--

WHAT THE GOVERNMENT DOES NOT WANT YOU TO KNOW ....

Early in 1969 the National Research Council published a report entitled "Projections of Manpower Resources and Research Funds 1968-1972", which has perhaps become better known as the "Bonneau Report." It was predicted in the report that the output of Ph. D's in Science and Engineering would exceed the number of positions for which a Ph. D degree was required. This would imply that a certain number of Ph. D's, according to our present concepts, would be substantially under-employed. These predictions were considered by many at the time to be unduly pessimistic and the authors of the report were accused of being prophets of gloom.

Reviewing the question one year later, we find that the situation is in fact appreciably worse than had been predicted. Moreover, a similar situation of "oversupply" has developed in the United States and the U.K., making emigration of appreciable numbers to these countries quite improbable. Likewise, the number of Canadians doing post-graduate studies abroad approximately equals the number of foreign students studying in Canada. Thus, we may take the output of Canadian universities as being a reasonable measure of the supply of Canadian Ph.D's in Canada.

For several years the output of Ph. D's from Canadian universities has grown at a compounded rate of 23 percent. The effect has been to make Canada technologically more self-reliant, to lessen the numbers of scientists and engineers Canada has had to import.

Despite our near realization of this goal the increase in output (corresponding to a doubling in new Ph. D's every 315 years) shows no signs of diminishing. See Table I page 6.

Although yearly fluctuations may occur, we see no reason to question the overall accuracy of these figures. The Ph. D output in 1969 was 7 percent lower than predicted, for example, but it seems likely that increased graduations in 1970 will restore the balance. More than 11,000 graduate students are currently enrolled in science and engineering faculties in Canada; sooner or later, with greater or lesser qualifications, they will appear in the employment marketplace.

A considerably more accurate estimate of the demand for Ph. D's can be made than was possible two years ago. In all employment sectors the Bonneau estimates turn out to have been optimistic.

The Bonneau Report estimates that the annual growth rate of employment in science and engineering faculties would drop from 13 percent in 1968 to 8 percent in 1973.

Actual employment rates have not, until recently, differed appreciably from this model.

There are now clear indications that the rate of increase in university funding will drop more rapidly, and to lower levels, than the Bonneau Report envisaged. The lower curve in Figure 1 shows the effect on university employmeny of a 13 percent growth rate in 1968, declining to a 6 percent growth rate in 1972. This is possibly an optimistic estimate, since it corresponds to a 14 percent increase in funding over each of the next two years. Our estimate also implies that about 40 percent of each year's supply of Ph. D's will find employment in university faculty positions. This, too, is open to question: *one major Ontario university, from which 112 science and engineering Ph. D's emerged in 1969, has six new Arts and Science faculty positions in 1970.*

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Only a modest increase (4 percent per year, with essentially no growth in 1969-70) was forecast in the Bonneau Report. The actual increase in employment of Ph. D's has been exceedingly modest, as Figure 2 indicates. The discrepancy is unimportant in absolute numbers.

In 1968 two hundred companies were asked by the National Research Council to indicate their likely requirements for science and engineering Ph. D's over the period 1968-73.

In April 1970 sixty companies (including the thirty research-intensive companies collectively employing 75 percent of all Ph. D's in industry) were surveyed as part of a Science Council study of industrial innovation in Canada. Trends in scientific manpower, by degree level, were collected in this survey.

The results are shown as the lower curve in Figure 3. *Over the two-year period the net increase in employment of Ph. D's was 40, instead of the 210 originally.*

Given prevailing economic conditions, we cannot expect any significant change in this number until 1971. *For the 1971-73 period a 5 percent annual increase in employment of Ph.D's seems reasonable.*

It is worth noting that the companies that are Ph.D intensive are currently showing least increase in total research staffing. Companies with a research staff of up to ten professionals expect to grow 10 percent or more each year for the next few years; B.Sc's and M.Sc's predominate in their laboratories, however, and this pattern is expected to persist.

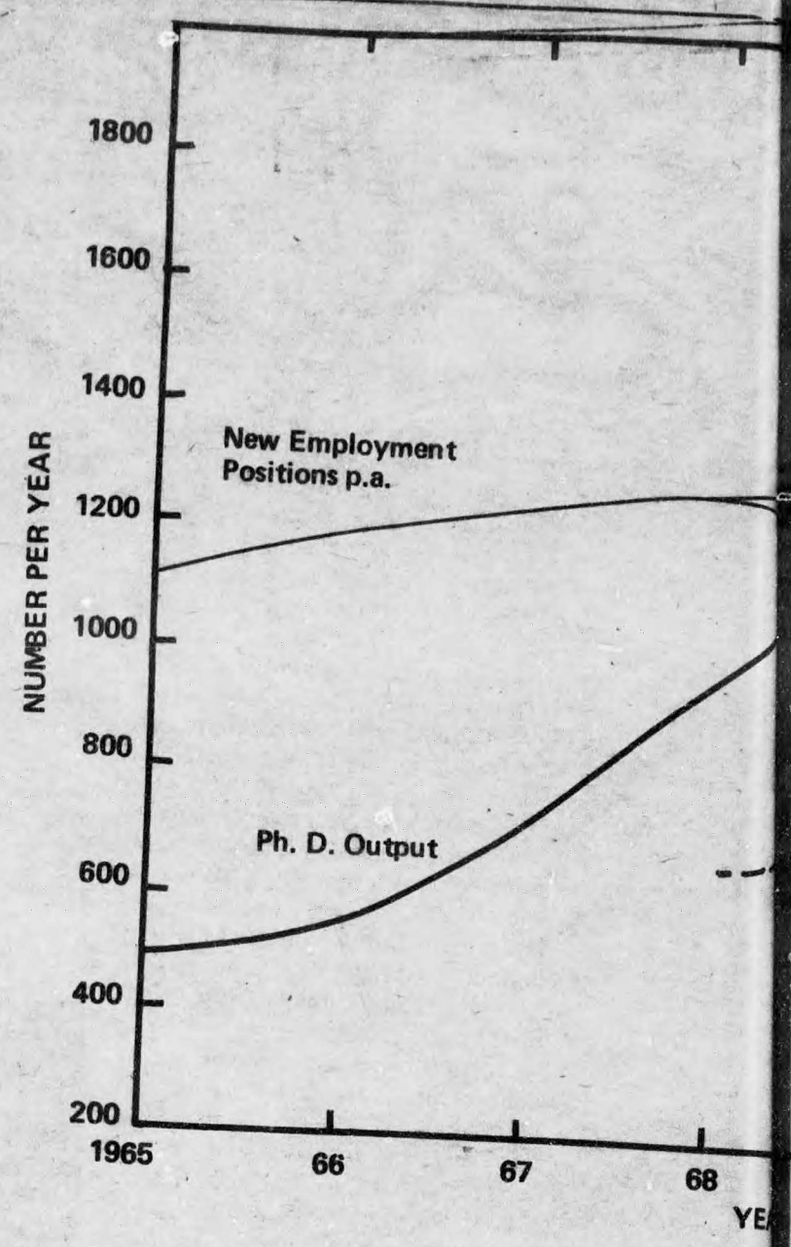
We can now combine these sectoral trends to produce a model for total employment of science and engineering Ph.D's in research and development. Figure 4 shows the gamut of the Bonneau Report projections together with our 1970 estimates.

In deriving these figures we have anticipated (as did Bonneau) a 4 percent annual attrition rate due to death, retirement, and transfer to functions other than R&D. The importance of 4 percent of the Ph.D labour force vacating their positions each year is shown in the Table II page 6.

In summary: for a variety of reasons, the annual number of new employment positions is now declining and in 1971, may be expected to reach its lowest value since 1964.

We have presented only the gloomiest Bonneau estimate for new employment positions (BCF).

Two curves are shown for annual Ph.D output: the lower assumes that 400 new postdoctoral fellowships will be created each year within



Hard Luck Story By [illegible]ttere[illegible]

SALAH HASSANIEN President Graduate Student Associat[illegible]

Thanks for the good planning, God blessings and our Big Brother in the South, it seems, that all problems (like pollution for instance) have been solved, Canada has reached the post industrial society with no social problems and everything is now great and everyone is now happy.

There is no need any more for people to spend 2-5 years studying to get some training in problem solving and what is called Masters or Doctorate degree. As for those who will be graduating soon, after finishing their graduate studies hard luck! , there is already a surplus in all fields. If you cannot pull a few strings and get a job then do not be sad. Nothing against you, it is the law of supply and demand. You should not complain for after all you have joined graduate school with your own free will (may be under different impression), and you have enjoyed spending wastefully tax payers money doing some reading and research (it is a sort of mental exercise). Of course, if you went to graduate school to get a degree then a better job and money, then you are wasting your dreams, energy, time and tax payers money (the last thing is alright it is done all the time). You better quit or if you would end up selling ski boots or working as unskilled construction worker or on welfare (these are actual cases I know). What a graduate school calendar doesn't tell you is that by getting a higher degree you are re[illegible] chances to get any[illegible] ployment. However[illegible] and administration[illegible] blame for not tellin[illegible] Federal governme[illegible] power and immigrat[illegible] ment and authoriti[illegible] think that the pro[illegible] exists (would not [illegible] rasing if it does exist[illegible] ever to show their [illegible] there are some st[illegible] starting on this m[illegible] bably by the time a[illegible] tees gather the neces[illegible] tics they will be ano[illegible] 5000 Ph. Ds who h[illegible] uated (an estimate fo[illegible] two years) so they w[illegible] start another study.

Anyhow, what if[illegible] blem exists? ? ! . Tak[illegible] old high government[illegible] and professors, they[illegible] degrees in the 30's w[illegible] ditions of employme[illegible] the same, look what[illegible] come of them, (I h[illegible] hearing this arguem[illegible] would it be safe to m[illegible] analogy between 3[illegible] now? ? Aren't things[illegible] quantitatively at leas[illegible] sides should the ec[illegible]

cycles designed by o[illegible] tors govern us, can [illegible] them to our advanta[illegible] wise people as we [illegible]

As from the point [illegible] of industry, it is doub[illegible] a Ph. D engineer can d[illegible] ter job than a B. Sc w[illegible] ing in the situation. [illegible] more the former is pa[illegible] and he is less loyal. (P[illegible]