

LEGISLATIVE ASSEMBLY OF ALBERTA

Title: **Thursday, April 30, 1987 8:00 p.m.**

Date: 87/04/30

[The Committee of Supply met at 8 p.m.]

head: **COMMITTEE OF SUPPLY**

[Mr. Musgreave in the Chair]

MR. DEPUTY CHAIRMAN: Hon. members, the Committee of Supply will come to order.

**Department of
Technology, Research and Telecommunications**

MR. DEPUTY CHAIRMAN: Mr. Minister, would you like to lead off?

MR. YOUNG: Thank you very much, Mr. Chairman. I'd like to make a few opening comments, more as an overview, I believe I could say it will be, than to get into depth. I think my comments will be followed by some brief comments from the chairman of the Alberta Research Council, Fred Bradley, and then we will be open to questions.

I'd like to start by indicating some of the responsibilities of the ministry first. The first one to touch on briefly is the responsibility of the ministry for Alberta Government Telephones in the sense of the government as owner and my responsibility as representative of the owner in terms of this Assembly and, secondly, the responsibility of the department in terms of telecommunications policy.

Very briefly, I'd like to indicate that the extended flat rate calling program, which is a program that was announced a year ago, approximately, is proceeding as quickly as can be accomplished, and I think quite quickly. Just for clarification I should indicate that the purpose of the extended flat rate calling program is to make it possible for subscribers in one telephone exchange to be able to call subscribers in another telephone exchange on a flat rate charge -- in most cases there is some additional charge -- rather than to have each telephone call between exchanges on a toll basis. So it is important to keep in mind that it is a system that arranges calls between telephone exchanges. Often I get letters and phone calls from individuals who are confused about that and believe that if a particular exchange has a route to another exchange and that second exchange has a route to a third exchange, when they get from exchange A to exchange B, they're automatically exchange A to B to C. And of course that isn't the way it works.

There are some criteria that have been laid down. The Public Utilities Board limits the extent of the routes to exchanges within 40 miles, one of the other, and that distance is measured by the location of the switch in the exchange -- from switch to switch, in other words. And that also is a source of misunderstanding from time to time, because people would prefer to measure from boundary of exchange to boundary of exchange, which of course could make quite a substantial difference.

I would indicate that there is one area of sensitivity, and that is that the program originally tried to identify exchanges most commonly used by subscribers to neighbouring exchanges, and

that was originally not intended to bypass a market area. What I'm now finding is that there has been more centralization, and we all know that rural Alberta farm machinery services have tended to become more distant and far between. We are now finding some circumstances in which the distance in northern, eastern, and some southern parts of the province is so great that subscribers in one exchange do not have an extended flat rate route to another exchange, and they can't understand that.

I think that if we had to revise the program at any time in the future, assuming the program is kept, without undergoing some greater change, we would have to take into account the effective geography and the fact that there are some people today who are unable to call the school where their children attend, the hospital on which they depend, or their municipal office, without going long distance. That to me is something that would have to be assessed very carefully in any future extension of the program or any future revision of the program, rather than just being governed by the distance between exchanges. Because that means, in fact, that some people theoretically are eligible to have flat rate routes between a variety of places while others aren't eligible at all.

In correction with the individual line service program, this program, as I indicated last summer in estimates, was intended and is intended to provide individual line service of a quality capable of providing computer hookup, and that means that the exchange switches generally have to be modernized in rural Alberta. It was for that reason that Alberta Government Telephones undertook a program which resulted in ordering \$90 million, approximately, of the very latest in telephone switches. That was done, I believe, earlier in 1987. Despite some discussion earlier this week, the order stands, the work proceeds, and the system will be modernized as quickly as those switches are available.

With respect to turning up some of the system, as you know, the work proceeded apace last year, and I imagine that between 16,000 and 20,000 subscribers could be put on individual line service as soon as the Public Utilities Board renders its decision on what the charges could be, and as soon after that that the residences for those subscribers can be provided with the telephone jacks which are current nowadays, which subscriber-owned telephones can be plugged into. I do not know when we'll get a decision from the Public Utilities Board, but I would imagine within 60 days would be a good guess.

With respect to telecommunications policy, just a quick word about that. There was a meeting of ministers of telecommunications in April, and that meeting resulted in agreement upon some principles -- I won't go into them because they were available by press release -- and agreement that ministers would take back to their respective governments some further items for consideration which would enable consistent national policies on interconnection and reasonable access to telecommunication systems and services across the country; also that it would result in effective sharing of governmental responsibilities for telecommunications policy. Of course, it will be some time before we know whether all governments will support the agreement which was arrived at.

I'd now like to refer to the second item of ministerial responsibility for which I report to the Legislature, and that has to do with the Alberta Heritage Foundation for Medical Research. I am very pleased to note to members -- and I think all members received a copy of the two reports -- that this was the first [inaudible] review by an international advisory body of the work of the Alberta Heritage Foundation for Medical Research. The

chairman was Dr. Jack Laidlaw, and I commend the reading of that to all members. I would point out to you in terms of its significance and its employment significance that in the two medical faculties at the University of Calgary and the University of Alberta there are, supported by this program, this fund, more than 100 medical doctors employed in full-time research sponsored by the Alberta Heritage Foundation for Medical Research. The international advisory board in its report provided a very glowing account of the foundation, of the management of the foundation, and of the direction for research that was taken.

Again, I won't go into the recommendations. You may want to raise some of them in the Assembly tonight, and I welcome questions on it. But I would suggest to you that that is a major success, the Alberta Heritage Foundation for Medical Research, which has received very little publicity in our province and which is not sufficiently understood. And I say that in terms of the business leaders in our community and also of the leaders of our community who are trying to promote Alberta, because it is a very significant and unique facet of Alberta research life, of Alberta medical services, and of Alberta's potential commerce.

The third agency for which I have responsibility on behalf of the Legislature is the ACCESS Network. I think the element of the ACCESS Network which will have the most interest for members this evening, and about which there may be some questions, has to do with the dubbing service. I would indicate that in past years the practice, as I understand it, was for schools to pay for a new tape which would be dubbed by ACCESS -- a videotape or audiotape, but in fact most of it was video -- or the school could send a used tape which would be redubbed with a different program. The only cost to the school was the cost of the tape. ACCESS paid the transportation to and from and the cost of dubbing as well. The volume of tapes increased tremendously over a period of time and has in fact increased in the order, I believe, of about 12,000 tapes per year from year to year in the last several years, maybe even more than that, and in the decision to constrain the budget increases this year, a dubbing fee was applied.

Now, I would just say a word about the practice that had been prevalent. Since the largest cost was for transportation and then for dubbing, the school was in fact able to recycle a tape over and over again. If I may draw this analogy: like buying a blank book, sending it in, getting it printed, reading it once, sending it in, having it reprinted, reading it again, and sending it -- you see the analogy, I'm sure. The result, I am told, is that very few schools, despite the virtually free service, built up much in the way of an audiovisual resources library -- this is some of the information that's come to me -- because they didn't have to. From the taxpayers' point of view it was not an efficient use of tax funds.

What ACCESS now proposes with the dubbing charge is two directions of service. One, to prepare block programs so that a particular program that might have, let's say, a series of 50 or any number of studies -- but I gather they go in units: 50 units, 70 units, 30 units -- that whole series would be available at much, much less than the dubbing cost for any single unit of the series, if a school wanted to purchase it. Secondly, it is proposed to deliver to schools -- or anybody, I guess, could tape them -- over the ACCESS television network between the hours of midnight and 6 or 7 a.m., school programming which can be recorded in the schools directly. So that if a school or, I suppose, a staff member or a friend of the school -- whoever -- wants to preset their recorder to pick up these programs, they would be downloaded over the air, could be recorded in schools

right across this province and used that way, and the school is still paying for literally very little more than the cost of the tape. That would be the most economic and most efficient way to deliver that kind of programming. The reviews and reports of that proposition so far have been very positive as far as ACCESS is concerned.

I'd now like to touch briefly on the Alberta Research Council, and I will deal only with that element of the Research Council related to budget, because that is a responsibility more directly of government, and my colleague Fred Bradley will deal with some of the activities of the council.

I'd like to indicate first of all that the Research Council -- and by the way, that estimate, if you're tracking it in the book, is the one I believe called natural sciences and engineering research. You'll note there that the grant involved under operating is a 5.6 percent reduction, so still holding at \$21.5 million-plus. The council, however, depends upon outside contracts for in the order of 50 percent of its revenue, and earlier this year was faced with the prospect of a potential, substantial reduction in its contract revenue. The council acted to adjust its expenditure patterns to accommodate the revenue that it then foresaw, and I would indicate as well that a very explicit decision was made to discontinue the hail studies program, or the weather modification program.

At that time, obviously there were some very talented researchers whose talents did not lend themselves to other areas of activity, and so there were some layoffs in that area. There has also over the last several years been a significant redirection of the council's research efforts towards some of the more highly technological areas such as electronics. So we saw a shift occurring which happened to pick up momentum just at the time of the Research Council's concern about its budget. It is my hope that some of the staff who had to receive notices of termination may, in fact, be rehired as the contract revenues for the council increase throughout the year and its contracts are renewed. I should point out that contracts terminate at staggered times throughout the year, the contract research element, and so it doesn't necessarily tie specifically to a fiscal-year basis.

Finally, I would like to make some comments about the Department of Technology, Research and Telecommunications. I realize that I've already run more time than I had intended to, so I will keep them very succinct and say that we are striving, with a department which has not had the expansion originally intended, nevertheless to accomplish the same objectives through the department.

Six areas have been particularly selected for attention; that is, telecommunications, biotechnology, electronics, computers, software, advanced materials, and processing in cold regions. Some of these are much more advanced than others, and we believe that as a matter of fact there's been very substantial development and again I would, I think, not get into any detail on it, I imagine there will be questions, because the centres and institutes, a good number of them, are listed, and if there are questions on specific ones, I would take those questions.

But I want to indicate to you that in the area of biotechnology particularly, in the area of electronics: those are two very rapidly advancing areas. That's not to take away from others, but if you're looking for the most active areas, those would be the areas. As you can tell from the estimates and from press releases that have been going forward throughout the year, a number of centres have been opened, such as the Laser Institute and the Alberta Telecommunications Research Centre, the Electronics Test Centre. These are all building blocks, all founda-

tions which do several things. One is, hopefully -- and I am quite confident that they achieve this -- they reduce the up-front capital cost that some companies may have to undergo otherwise. They provide expertise in areas, expertise which ties to the universities, which ties to industry and thereby is a source of ideas and research knowledge. They are training grounds for graduate students and students in the sciences, which is very important for us in the future.

A centre such as the Electronics Test Centre has the great advantage that it enables products to be tested in Alberta for entry into markets elsewhere, and the testing is important for these reasons. First of all, there's a very fast turnaround because it's occurring here, which, second, makes it cheaper. Thirdly, it is a turnaround which enables the client to learn from the test centre what difficulty there was with the product. Now, if the testing is done in a distant location, that is very much more awkward to obtain, that kind of information. The result of it is that we have developed from the Electronics Test Centre a series of identified problem areas for our Alberta -- and western Canada, for that matter -- manufacturers, and that centre is now starting to put on seminars for manufacturers so that they can improve the manufacturability of their products, the testability of the products, the longevity of service or the warranty guarantee element of them.

Mr. Chairman, I have taken more time than I would like to do, and I have barely scratched the surface of a very interesting subject. I'd like to give my colleague the hon. Fred Bradley an opportunity to discuss for a few moments the Alberta Research Centre activity.

MR. DEPUTY CHAIRMAN: The hon. Member for Pincher Creek-Crowsnest.

MR. BRADLEY: Thank you, Mr. Chairman. I want to talk as briefly as I can about some of the activities of the Alberta Research Council. It's a very comprehensive research organization, and I'm going to try to just mention the highlights.

But before I do, I'd like to acknowledge the efforts of Dr. Bob Stewart, who is the president of the Alberta Research Council. He's in the gallery this evening. Dr. Stewart is going to be retiring at the end of May. He is a distinguished world-class scientist in oceanography, and we've been very thankful for his stewardship and leadership at the Alberta Research Council over the last three years. Thank you, Dr. Stewart. He's going to remain active, though; he's going to be at the University of Victoria in British Columbia.

We are very fortunate to have a very eminent successor to Dr. Stewart in Dr. Clem Bowman, who many members know in his position formerly as chairman of the Alberta Oil Sands Technology and Research Authority, and most recently he has been vice-president of research for Esso.

I'd also like to acknowledge the dedication and involvement of the board of directors of the Alberta Research Council. They provide us with very wise input in terms of the overall management and direction in terms of policies of the Research Council. And also, Mr. Chairman, I'd like to acknowledge the efforts of our senior management and all of the staff at the Alberta Research Council whose work has contributed significantly to the advancement of the Alberta economy over the past number of years.

Last September we had the opening of the new laboratory administration facilities for the Research Council, located at Mill Woods. That facility cost some \$65.6 million, including

the land cost for the building; I should note that it came under budget. It is some 30,000 square metres of space there, and there are 96 bench-scale laboratories in the Research Council facilities there. One should note that this is probably the largest expenditure on a research facility in Canada in the last decade, in terms of the commitment of the Alberta government to this research organization. I should also note that the Alberta Research Council is the largest of the provincial research organizations in Canada.

Some of our other facilities include our heavy oil and oil sands hydrocarbon facilities at Clover Bar. We also have coal and hydrocarbon research facilities at Nisku. We're involved in the coal research centre at Devon. Our advanced technologies department is located in Calgary, and we also have an office in Lethbridge. So the Alberta Research Council facilities are placed, in fact, throughout the province.

The minister mentioned the activities of the Electronics Test Centre. That is managed by the Alberta Research Council. There is a separate Electronics Test Centre management committee, and we provide the services which the minister has mentioned. I should also note that another exciting facility within the Alberta Research Council facilities at Mill Woods is our biotechnology pilot plant; I intend to talk about that a little bit further. Also, we manage the Electronic Industry Information Centre, which provides up-to-date information to Alberta industry. So this is part of the infrastructure which we have at the Alberta Research Council to aid in research and development and to assist industry in the province.

The minister has mentioned the effect in terms of budget decisions with regards to weather modification, and I should also like to acknowledge the efforts of the scientists who worked in the weather modification program. They're certainly worthy of notable mention in terms of their efforts and contribution to weather modification research in the world. The atmospheric sciences department and the civil engineering department have now been combined into a new department called the resource technologies department, and they will be looking at work in terms of meteorology and hydrotechnology and continuing their work in transportation.

One of the exciting initiatives which the Research Council has come forward with over the past number of years is the joint research venture program, and this program basically provides an instrument for the transfer of technologies to private industry. There have been to date some nine joint research ventures worth approximately \$16 million since the inception of that program in 1983, and the funds are contributed equally by the research council and the private sector. It should be noted that to date the funds for this exciting initiative are committed, but as projects are completed, we will have the opportunity to get involved in some other exciting initiatives.

Some of the areas which the joint research ventures have covered to date -- and I'd like to list some of the companies and some of the activities so the members will have an appreciation of the type of joint research ventures we're involved in. One is with Intera, and it is involved in the down-link display of synthetic aperture radar. This company has had contracts not only in this province but also offshore, particularly in Greece. So they are benefiting from their association with the Alberta Research Council, and it's bringing recognition to Alberta industry in terms of outside province, outside of country international contracts.

The second one is with ens Biologicals, which was with regard to research and development in the field of advanced en-

zymology. We have one with Q.C. Data, involved in vector-editing work stations. We have one with Nortech Surveys, which looks at the very exciting area of global positioning satellites and laser profiling. This is going to be very exciting in the field of surveying in the years to come, and we expect that this company will be able to gain a significant market share in terms of global positioning system satellite surveying in the future.

Another joint research venture is with D & S Petroleum, and it deals with expert system well log analysis. We have one with a company called CBTS, which looks at expert systems for computer-managed learning.

There were two new exciting joint research ventures which I wanted to share with the members, which we just have recently become involved in. One is with the Western Geophysical Company of Canada, which is a Calgary-based integrated geological and geophysical company, and it's a member of the Litton group of companies. It's considered a leader in the field of advanced seismic techniques and processing, and it has developed expertise in high resolution D seismic surveying for both exploration and production applications. The Alberta Research Council and Western Geophysical have undertaken an 18-month research project designed to improve the success rate and economic viability of miscible oil recovery. The joint research venture partners will combine their geophysical, geological, and engineering expertise in an effort to find a reliable method of monitoring the behaviour of fluids used to recover oil from Alberta's maturing oil fields.

They'll be using CAT scan equipment and techniques which have normally been employed to visualize the human brain. They will be examining oil field cores to learn what actually happens when flooding is used to push part of the remaining crude to the surface. This knowledge will enable engineers to control the flow of various solvents and gases now commonly used to dislodge the oil, making enhanced recovery a more efficient and cost-effective process. Geological survey personnel at the Alberta Research Council will contribute an in-depth view of Alberta's geological scene as well as an expertise in identifying oil reservoirs which promise high recovery levels.

The potential benefits to the province, Mr. Chairman, are that there are an estimated 3.4 billion barrels of oil in Alberta which are recoverable only by miscible flood methods. An improvement to this process will be reflected in increased production and improved royalties for the province. The success of the project is seen in improving the opportunity for Alberta's geophysical industry generally, generating techniques with worldwide application. It's anticipated that there will be future applications of this technology to heavy oil and oil sands recovery.

The other exciting, newly initiated joint research venture is with Pelorus Aviation Supplies Canada Ltd. Pelorus Aviation Supplies is an Alberta company which is headquartered in Calgary. It maintains a presence on Canada's east and west coasts and has sales offices in Toronto. Since its establishment in 1981 as a specialist in navigation systems for the aviation industry, Pelorus has developed extensive distributorship arrangements with the leading electronics companies, secured markets, and developed a reputable manufacturing organization. What's exciting about this joint research venture, Mr. Chairman, is that Pelorus has pioneered microwave landing system installation technology, having installed the first microwave landing system in Canada at the Jasper-Hinton airport in Alberta. By undertaking an aggressive research and development program at this time, Pelorus intends to capture a significant share of the general

aviation market for airborne microwave landing system receivers and has identified a sales potential of some 90,000 out of the 200,000 units likely to be required worldwide by the year 2000.

The Research Council and Pelorus will collaborate on a 24-month project to research and develop an aircraft microwave landing system receiver and guidance control system. The technology is being developed in response to a 1978 decision by the International Civil Aviation Organization, the world body for aviation standardization with some 189 member nations, to standardize the time reference scanning beam. Microwave landing systems haven't developed as a replacement for the existing instrument landing systems. Conversion to the new electronic system is already under way. All new airports are equipped with microwave landing systems, and instrument landing systems are to be completely phased out by the year 2000.

So, Mr. Chairman, this is a very exciting joint research venture. The project involves the integration of various technologies, including embedded microprocessors, electronics, and control systems. Research is going to be conducted at Pelorus' Calgary headquarters and the Research Council's advanced technologies department in Calgary and making use of the Electronics Test Centre in Edmonton. This project is expected to contribute to the economic diversification of Alberta through the encouragement of a nonenergy related industry with strong job creation and export possibilities.

There are some other interesting things, Mr. Chairman, which the Research Council is involved in which is leading involvement in terms of developments in Canada. I'd like to advise the members of the Assembly that the Alberta Research Council has become a founding member of Intelligence Systems Incorporated, Canada. It's my understanding that there's a widespread agreement among observers of emerging technologies that robotics and artificial intelligence are likely to have a significant impact on mankind that has had no parallel in recent history. There is excellent research and development ongoing within universities and government laboratories throughout Canada, and because it is still in the embryonic stage, it is open and receptive to new forms of support and alliances.

A key element for the bridging of fundamental research to the final product must be a greatly enhanced appreciation by Canadian industry of its dependence upon such technologies and a collaborative effort to work with universities and governments to design and implement a truly national effort in longer term precompetitive research. As such, Mr. Chairman, the Alberta Research Council has joined 21 Canadian corporations to fund research in robotics and intelligence systems, known as artificial intelligence. The corporations range from small high-tech operations to some of Canada's largest resource utilities and manufacturing companies. The consortium's name, as I mentioned earlier, is Intelligence Systems Incorporated, Canada and has been initiated by the Canadian Institute for Advanced Research.

So, Mr. Chairman, the Alberta Research Council is involved at the beginning of a very exciting establishment of a Canada-wide effort in terms of intelligence systems.

I wanted to mention briefly some of the developments which are taking place at the biotechnology production facility, Mr. Chairman. I think we are very fortunate that the Alberta government has invested the dollars it has in the biotechnology pilot plant which is located in the Research Council facilities at Mill Woods. This is a world-class facility. I don't believe there is a similar capability to the extent possible which we have at the

Alberta Research Council in this particular area, not in western Canada and perhaps we are the leaders in Canada.

We have just recently entered into an agreement with a company from Palo Alto, California, to use the production facilities at Mill Woods. The company's name is BIOSIS, and they are a Californian pest control company. What they intend to do is to scale up and produce biological pesticides from nematodes, which are tiny insect-killing organisms. What this will lead to is a natural method of insect control for food crops, lawns, gardens, greenhouses, and homes, which could find a wide commercial market. This is a very exciting research contract, utilizing the production facilities in our biotechnology pilot plant at Mill Woods. Biotechnology is certainly an area which is going to play an increased role in terms of the new technology in the world and in terms of economy throughout the world. So we have one of the best facilities, in my judgment, in terms of our 15,000-litre fermenter which is under construction at Mill Woods, with a total capacity of 30,000 litres in this fermenting process, which is unparalleled in Canada and which is going to contribute significantly to the advancement of the economy in the province.

Mr. Chairman, I did want to talk briefly about coal research, but I know that there are members who wish to get into the discussion, so I'll be as brief as I can. We have some very exciting research going on in the coal area at the Alberta Research Council facilities. One of them is a coal/oil agglomeration research project which sees the use of our heavy oils and our coal in an agglomeration process which upgrades the coal. We are able, through this process, to use our heavy oil from our bitumens and also our lower grade coals, upgrading them.

In terms of the environmental problems which are being faced in eastern Canada with regard to production of electricity by higher sulfur content U.S. coals, we think this is a cutting edge technology which will enable us or assist us in reducing costs so that we can get into that very important eastern Canadian marketplace. It should be noted that the research which is taking place at the research centre is in conjunction with the Electric Power Research Institute of the United States of America. It is situated in Palo Alto, California, and they, along with a consortium of 20 other research groups, including utility companies, have engaged upon this research. We will be engaging upon this research; we expect the contracts will be concluded shortly. This will be leading research in this area of the upgrading of coals, which we hope will lead to breakthroughs which will provide us with access to the eastern Canadian marketplace.

I want to briefly mention some of the developments with regard to the forest products development which is taking place at the Research Council. Members are well aware of the oriented strandboard which has been developed, and we have manufacturing facilities, I believe, at Hinton and Drayton Valley, with regard to oriented strandboard. There is a new product which the Research Council has been involved in; it was on the cover of the Research Council's annual report. It's a waveboard, and it has been developed through the efforts of Dr. Lars Bach at the Alberta Research Council. It's a very exciting new application of the oriented strandboard technology. It's basically a corrugated board, and we think that it can replace existing uses of metal and other wood-panel products in terms of the construction industry.

So, Mr. Chairman, the Research Council is engaged in many different areas of activity which have an effect on the current Alberta economy and the future Alberta economy. In conclu-

sion, the Research Council is involved in the development of our natural resources, through co-operation with industry and universities, and advancing the economy of the province of Alberta.

Thank you, Mr. Chairman.

MR. DEPUTY CHAIRMAN: The Member for Edmonton Mill Woods.

MR. GIBEAULT: Thank you, Mr. Chairman. I'd like to begin my comments on the debate this evening for the Department of Technology, Research and Telecommunications by making two comments that are very positive, two expressions of gratitude, I guess we could say. One is that in reviewing the estimates today, I think we have to be quite pleased that the minister's office is showing a substantial reduction, much more than other parts of the budget. I think that is certainly a very positive sign, to show that kind of leadership, even though the minister's own salary, I notice, went untouched, which a lot of my constituents would be pleased to have had this year. But the minister's office shows a sizeable reduction, and he is to be commended for taking that initiative.

The second thing I want to commend the minister for, and his department and ACCESS Network, is the fact that they now, after suggestions from us and many others last session, cover question period for the citizens of the province of Alberta. I know that many of my colleagues have received feedback from their constituents to the effect that they find this is very, very interesting. It helps them follow the government of the day and the issues of the day, the government's response to the issues, and they generally have a very positive feeling towards it. It's actually very surprising to me, Mr. Chairman, just how many of my constituents do watch it. Perhaps part of the reason is that so many now unfortunately are suffering from unemployment. But be that as it may, I think it is very much a step forward, and the department and ACCESS are to be congratulated for that.

In terms of the budget estimates more directly, there are a number of questions that we'd like to put to the minister. The first one is that we notice in this year's estimates that the allocation for investments is increasing from \$6 million to \$12 million, and that's an interesting part of the budget, I think. I would like the minister, if he would, to explain to the Assembly and to the members here what form that is to take. Is that to take some sort of a share offering with various corporate entities in the province? If so, what companies will be affected by that? And I guess I'd ask as well, in a more general sense: does the minister see this as being a trend in his department to increase the amount of assistance as budgeted under the investment category as opposed to grants and perhaps others? So I'd appreciate the minister's comments on that.

Going to the element section, under vote 1. Under vote 1.0.3, we notice that financial and administrative services are increasing 9 percent, and I have to wonder why that is, Mr. Chairman, when the whole department budget is being reduced fairly substantially. Why is it that we need to spend almost 9 percent more administering a total budget that's substantially less than it was the previous year?

In terms of item 1.0.5, technology commercialization, this is showing a 10 percent reduction, and I would ask the minister if he could explain why that is, because it seems to us that we want to give a high priority to technology commercialization. There's no point in having new technologies that sit in the laboratory; we've got to get them into commercial production

where there are jobs created in the engineering, the production, the distribution, and the transportation sectors all the way through the economy. So a 10 percent reduction is something that seems inconsistent with the emphasis that I think the government has tried to tell us, that technology is going to be one of the new pillars of economic diversification in the province.

Finally under vote 1, vote 1.0.8, human resources, an increase of 28 percent. Again I have to ask, Mr. Chairman, why is it that we need a 28.5 percent increase under that budget item when we have 10 percent less staff in the department?

Moving on to vote 2, Mr. Chairman, and some of the specific projects there. We notice that in vote 2.0.1, grants for technology and research projects, there's no change there: \$2.5 million. I would like to ask the minister if this means that these will be the same projects continuing from last year, or are there any that will be new this year, replacing some that have been terminated last year? And if he could give us some examples of the projects that are being funded under vote 2.0.1., that would be helpful, and any evaluations that may have been done of them to date.

Vote 2.0.2, Alberta Telecommunications Research Centre, shows a 22.5 percent increase in their allocation. Perhaps the minister could explain what that represents. Are there going to be some new services provided by the centre this year? Will there be an expansion of their program activities? Exactly what does that represent?

Vote 2.0.3, the Alberta Microelectronic Centre, the microchip design and fabrication facilities, is showing a 5 percent decrease in the coming fiscal year. I wonder if the minister could tell us, because they were new facilities last year, how they are performing, both the one in Edmonton and in Calgary. Can you give us an idea of how many chip designs have been produced from the centres? How many have gone into production? What kind of applications for chip designs have come out of the centres? Are there any commercially successful chips yet at this point in time? Any answers to questions like that I think would be very helpful.

In item 2.0.4, the Alberta Microelectronic Centre, we see a substantial decrease there of 28.6 percent. It would be interesting to find out from the minister if he could explain simply why that is. That's a major reduction, and certainly computer software, computer technology applications, are ones that the minister has mentioned before as being a priority.

Item 2.0.5, the Supercomputer Centre, shows a decrease of almost half, and again it would be helpful to understand why that is.

Items 2.0.6. through 2.0.8 show no change; that is, the Alberta Laser Institute, Centre for Frontier Engineering Research, and advanced materials and processes. Again the question would be: does this mean that the funding is simply to extend the current activities of those three projects, or are there any changes in emphasis in those particular programs? If so, could he elaborate on them?

Item 2.0.9. This question of satellite receivers is an interesting one. We're terminating that allocation this year, according to the minister's budget estimates here, and my understanding of that was that this was to allow rural schools throughout the province to put in satellite receivers in order that they could benefit, principally from our ACCESS Network. The implication of terminating that program is that all rural schools in Alberta now have satellite receivers and now can pick up the ACCESS Network, so I'd like the minister to confirm if in fact that is the case. And if it is not the case, can he explain why that

program is being terminated?

Item 2.0.11, computer systems development, shows a new item of some \$500,000, and it would be helpful if the minister could make some comments on what that represents. What will that be used for?

Item 2.0.13, the SPURT Investment Fund, is another new allocation here of some half million dollars. Again, in the news release that went with that, there was an indication that two projects had been funded under the allocation at the time when this press release went out. Could the minister explain to us how those two projects are coming along now and whether or not there are any new ones that have been funded subsequent to that?

Under 2.0.14, the research park multi-tenant facilities and the high-tech incubator program, it would be helpful if the minister could give us some explanation of that particular allocation. I recall his earlier press release making reference to that and the indication that the idea was that new high-tech firms would take part at the research park facility and after a couple of years would expand and develop to the point where they would move out and grow on their own. Since the time this funding announcement was made, some time ago, I wonder if the minister could explain to the members of the Assembly how that particular project is coming along.

In terms of budget item 2.0.15, genetics research, another new item of \$3.5 million. A substantial allocation there, Mr. Chairman, and it would be interesting if he could explain to us exactly what that is for. Where will this genetic research take place? Who will be involved in that, and can the minister give us some assurance that the research that will be undertaken will follow the national guidelines that exist regarding genetic research? Because I'm sure he appreciates that that is a very important area of research, but one that also has potential for some serious problems if not handled in a very careful manner.

Budget item 2.0.16, medical/pharmaceutical research: \$7.5 million, an increase of 34 percent over the allocation last year. Again the question is, Mr. Chairman, if the minister could advise us what the nature of that increase is. Again, is it an expansion of the existing research that is being done? A new program? Exactly what does that represent?

One of the other things that I think would be useful, Mr. Chairman, is if the minister could advise us, in terms of all of these projects, all of which I think have merit to one degree or another, if in fact in any of the evaluation that's taking place on these, which I'm sure there must be on an ongoing basis, is one of the criteria -- I would certainly hope it is, for the substantial amounts of money that we are allocating here -- is there any review of the job cost-effectiveness regarding these allocations? Are we in fact contributing to direct enhancement of technical research, engineering, employment opportunities, and the spin-off opportunities that will come from that? Or are we spending a very high amount of money, in some of these cases, for very little return in the way of employment for the citizens of our province?

The general question then is: for all of these projects under vote 2, what evaluation has been done of their job cost-effectiveness, if you like?

In this whole area of technology projects, the province of course is involved in co-operative efforts with the federal government, and they have a number of programs. One of them is the technological opportunities in Europe program, and I wonder if the minister could comment as to what involvement his department and the institutions for research, the ARC and so on,

have had with that program. It seems to me that that had a lot of promise, in the sense that it made sure that we had good contacts in the research communities with the European communities as well as our neighbours to the south. I'd appreciate any kind of feedback he can give us on the department's involvement with that, or any kind of feedback he may have had from the ARC or our universities or other people who have been able to take advantage of that particular program.

In terms of the Alberta Microelectronic Centre, the press release that the minister put out September 19, 1986, indicated that

The design centre, with a business manager and two design engineers on staff, expects a full complement of some 200 employees, including programmers, technicians, and graduate students by 1987.

My question is: is this in fact still the current staffing plan for the Alberta Microelectronic Centre in Calgary? Or has that been changed in terms of the new fiscal environment that the province now finds itself in? The commitment in his release of September 19 was for 200 employees by 1987. My question again, to summarize: is that in fact still the plan?

In terms of the area of the press release that the minister issued on October 16 regarding the electronic industry information system in Calgary, that has now been in operation apparently some five months, and it would be interesting to know if he could advise us how many firms or institutions have made use of this new facility. How many inquiries has it handled? What feedback has the minister or his department received regarding this particular new centre's usefulness to firms or institutions doing research in the electronic industry in Alberta?

Another area that I must commend the minister and his department for is the exchange of scientists with other countries. I refer to his January 28, '87 release regarding the Chinese scientists who arrived in Alberta. My question to the minister on that is: will that exchange process be continued in the current year? If so, is there a possibility that the exchange might be broadened to include scientists from other countries?

Another area I'd like to ask in terms of this whole area of support for high-technology projects, Mr. Chairman, is the minister's interest to date, if any, in organizations such as the Alberta Interprovincial Association for Telematics, telematics being the integration of communications and computer technologies with sound educational theory and practice to produce low-cost, flexible, and highly effective learning systems. I know many of the educators who are in the province of Alberta and have been working in educational media- and computer-assisted instruction, computer-managed learning and so on, have a very great interest in this whole area. As far as I'm aware, the minister and his department -- at least his estimates do not indicate any sort of support for groups like Alberta IPAT or others, and I wonder if he might comment on why that is the case.

Turning to vote 3, the natural sciences and engineering research area, the Alberta Research Council being the main one. We had some overview of the activities of the Alberta Research Council earlier, and certainly there's no question that the Alberta Research Council has done some excellent work, continues to do excellent work, in a variety of areas. Certainly I'm very pleased that their major research facility is of course located in the constituency of Edmonton Mill Woods. I'm somewhat disheartened, though, to see that in the minister's estimates he's proposing in the element details a reduction of 8.8 percent in the allocation for the ARC. It seems to me again, Mr. Chairman, that if we're really serious about an attempt to diversify

the economy, it does not make sense to be reducing the kind of applied and important research being done by the ARC. In fact, we had press reports just a little while ago that these cuts now were going to result in some 72 jobs that are going to be lost at the centre, many of these engineers and scientists, some of them in my own constituency, Mr. Chairman; PhDs who are now without productive work. And I kind of wonder if it is really wise to deal with a short-term problem in this manner, because when highly trained, skilled, educated people get a message from the government that there's no place for their talents here in Alberta, they look at other locations, whether it be eastern Canada, the United States, Europe, or elsewhere. These are people who are very highly trained, with very specialized education, people who've done a lot of work for our province over the years, and some of these people are now being released. It seems to me that this is certainly not an effort that will contribute to the diversification of our economy, and I would appreciate some kind of a response in that regard.

I think that if we continue this sort of reduction in our Research Council support, we're going to end up with a very serious brain-drain phenomenon, and I think that, in combination with the cuts by the minister's colleague the Minister of Advanced Education, is really going to leave the research community with a very curious message, Mr. Chairman. I think the message is going to be that research in this province is being downgraded. I think that is the wrong message to send at this time of economic downturn and when we're trying particularly hard to try to get away from the primary resource industries of this province to a more diversified and balanced economy.

One of the other areas that the minister advised in terms of a recent news release was this area of the technology inflow program in co-operation with our federal counterparts, and I would be interested if the minister could give us some indication of how effective the technology inflow program has been to date, how many Alberta companies have been involved, what scale is this operating on, and with what countries have we had arrangements for technological inflow or exchange.

Two other areas that I want to touch on in terms of the ARC, Mr. Chairman, are the recommendations of the Auditor General. Recommendation 44 in the Auditor General's most recent report suggested that the Alberta Research Council Act may be deficient in the sense that it does not provide for partnerships with ARC and other entities which ARC had been engaged in. I wonder if the minister can advise the House if he will in fact be bringing forward some amendment to the Alberta Research Council Act, which we notice has not been updated since 1981, to deal with that recommendation of the Auditor General. If not, perhaps he could tell us why not.

Auditor General recommendation 45

recommended that the Alberta Research Council:

- develop and implement immediately procedures which will facilitate the identification of fixed assets held but not owned by the Council,
- be as specific as possible concerning the amount and types of costs which are chargeable to projects in research contracts, and
- establish a system to control, in a cost effective manner, the custody and use of materials and supplies.

I would ask the minister simply if he can advise us what progress has been made by ARC in complying with recommendation 45 of the Auditor General.

Now, to move to vote 4, which is multimedia education ser-

vices, primarily ACCESS Network, I think the minister was quite right; I have a few comments to make about that. It's of concern to us, Mr. Chairman, that here under vote 4.2, development and production, the minister is proposing to us to reduce the allocation some 5.6 percent. It seems that if we allow this to go through, we're going to be denying opportunities to the producers, the directors, the artists, the technicians: all the people who are responsible for the production of Alberta-oriented educational material for the students in this province. I think that would be a sad, sad development, because we just heard in the paper the other day, for example, that new teachers in this province have no future here and that they might as well go down east or across the border south of the country. Construction workers are in the same situation. There's virtually no work here, so they're going down east and south of the border. Now it looks like we're adding some other people to that list of people who are going to have to migrate out of our province because there's a lack of opportunities here. That, I think, talks to the performing arts, the cultural arts, the media arts community. That's going to be simply less opportunity for them. I think, Mr. Chairman, that is a mistake.

Item 4.3, media utilization: the minister referred to that in his comments; a 21 percent reduction. I think really what that means is simply that the government is proposing to transfer the responsibility for media educational materials from his department, from ACCESS, to the schools. Because what ACCESS has done is to implement, as the minister mentioned, new user fees, because before, schools simply had to provide the cost of tape. Now on top of that they have to provide the \$12.50 duplication fee. If there's a teacher guide with it, it's an extra \$5. Postage and handling is an extra \$5. So that's \$22.50 on top of the \$6.50 for a 30-minute VHS tape: \$29 now, Mr. Chairman, for an item that last year cost \$6.50. That's an increase of 400 percent in a single year. I would ask the minister: where does he expect schools to get this kind of money? His comrade the Minister of Education has proposed reductions of 3 percent across the board. So where are the schools going to get this money, Mr. Minister? A 400 percent increase: do you think that the schools have some new source of money that they're going to be able to provide resources here?

On top of this increase, the Minister of Education also cut the Regional Film Centre. She's proposing to virtually eliminate their provincial support within the next two years. On top of that, we've got this move here, which is going to have a very, very negative impact on schools picking up media materials from ACCESS. So you add all those factors together, Mr. Chairman, and I think that sends a very strong signal to the schools of this province. I think the message is that this government, through its Department of Education, through its Department of Technology, Research and Telecommunications, under ACCESS, really is moving out of the educational sector, is moving away from the original mandate. Mr. Chairman, of ACCESS Network, which was to serve the educational media needs of Alberta students.

I think there's no question that this very substantial increase at a time when resources to schools are otherwise being reduced -- there's just no question about it -- is going to mean a reduction in the utilization of educational media materials in the province. I would suggest, Mr. Chairman, that this is penny-wise and pound-foolish. We're going to be saving a few dollars here, and at the same time we're going to compromise the very substantial investment that ACCESS Network has built up in its educational material inventory, because now schools will not be

in a position to avail themselves of those materials.

Mr. Chairman, recognizing that there are many other people who want to participate in the estimates of this department tonight, I have only one more question, and that relates to telecommunications policy. The minister referred to that briefly in his comments. I would like to ask the minister one question in terms of telecommunications policy, and that is simply this. There are rumours that telephone companies are looking at introducing toll service for residential clients, whether it be in Alberta or other jurisdictions in Canada. Certainly Bell Canada in eastern Canada has promoted that concept. I would like to ask the minister directly if it is the policy of his government and his department that under no circumstances will residential users be allowed to be charged toll fees for local service. I'm not talking about long-distance service, but for local service. There have been rumours to that effect, particularly in eastern Canada, and I think many Albertans reading these reports are concerned that in Alberta that may be the same circumstance. Perhaps the minister can clarify that for us.

The last thing I want to ask the minister this evening in terms of telecommunications policy is simply this. I understand that in the city of Edmonton there is no competition for telecommunication suppliers to the Alberta government, that it all goes to Edmonton Telephones, and I know that there are many of my constituents and others around the province who work with telecommunication interconnect suppliers who are very disturbed about this particular situation. They feel it is an unfair competition environment, that they are not able to compete and offer their services to the provincial government in the city of Edmonton. I would appreciate it if he could clarify what the position of the government of Alberta is in terms of acquiring telecommunication services in Edmonton city.

Thank you, Mr. Chairman.

MR. DEPUTY CHAIRMAN: The hon. Member for Ponoka-Rimbey.

MR. JONSON: Yes, Mr. Chairman. I just have four or five items that I'd like to speak about and pose a few questions to the minister on.

First of all, though, I would like to comment on this matter of the dubbing service provided by ACCESS and the additional fees being charged. Certainly we are in a situation right now where money is short and has to be very, very carefully used, but my estimation of the situation is that this is not going to be a particular hardship for the schools. In fact, I think it is going to have some benefit, because it will lead to, as you indicated, more careful selection of tapes and films. I would just make the suggestion that perhaps in the catalogues that are provided from the film centres and from ACCESS, there could be additional attention paid to the description of the items being ordered so that people can assess these things carefully before investing money and ordering these items. But I think it has to be recognized that a good program on tape or a good book today is a costly item and has to be selected and ordered with care, and I do not think that the charges being levied at the moment are excessive.

However, Mr. Chairman, I do have a couple of other questions related to this area of ACCESS and educational media, if I could call it that. I have a concern that perhaps we are not progressing as quickly as we should be in a co-ordinated effort to provide distance education to isolated parts of this province. As I see it, at the moment we have the ACCESS Network in this

field; we have CKUA radio, that has a limited clientele in the educational sphere; we have the Correspondence School, which is working in another area of distance education; and we have Athabasca University, which in some ways has put the technology and the paper materials together as well as anybody, but they're only working in the area of advanced education. On top of that, we have the computer learning centre in Calgary, which has some of the technology that could be used in an overall planned distance education effort. I noticed that there are a number of other activities around the province, people that are developing material that could be used in this overall effort.

So, Mr. Chairman, my question to the minister is: what co-ordination is taking place, if any, in a planned approach to providing good quality distance education services to the parts of the province that particularly need it as soon as possible? I see a large number of very promising, very exciting things going on in this area, but I just do not see it coming to a focus where it's going to bring readily usable, practically applicable programs to help the teachers and the students and the communities where this kind of education is needed.

One other question in this area related to education, as it applies to this department: I'm curious to know if the minister's department has any role in setting down the requirements whereby cable companies get their licences in a particular area. It was my understanding that there were certain obligations that went with obtaining a cable licence, one of which was to provide educational services at no cost to the community, to the school. I find it curious that an urban member just previous to me mentioned a concern about how extensive these dishes are. I'm asking about an urban problem, and that is: is there an obligation on the part of cable companies to provide cost-free cable hookups to schools to convey ACCESS and other educational programming to them?

Mr. Chairman, to the minister, I think that you'll get quite a few questions in the discussion of your debates about AGT and private lines and extended flat rate calling. I would like to just quickly pose three or four that keep coming up in my constituency. When the private line service reaches your area, does an individual have the opportunity to opt out of the program; that is, not take a private line? That seems like an odd question, but I guess some people like the party associations that they have at the moment, a good way of spreading the news perhaps. Secondly, what is the arrangement going to be for those people that already have paid for their private lines? Will they be compensated the amount that they originally paid to get the private line in, or will they get some type of an average amount rebated to them? What will be the approach to that particular issue? Also, of course, Mr. Chairman, I would like to know the minister's best estimate of the time line for complete private line installation across the province. I hope it is within the five years projected, although I realize we have to work under rigorous budget constraints at this present time.

I have one question about the extended flat rate calling, and that is that I'm not quite clear as to whether the reason that extended flat rate calling cannot be extended to a greater degree across the province is purely a matter of Alberta Government Telephone's having to watch what they're doing in terms of adjusting revenues and so on to keep up with the loss that occurs from individual long-distance calls not being charged for or whether there actually is a great deal of equipment and manpower that is required to provide this service. Because if it is only or primarily the first, I would think that Alberta Government Telephones might be extending extended flat rate calling a

little bit more widely and a little more quickly than they are at the present time.

I have, Mr. Chairman, just two other quick questions. One pertains to the Alberta Research Council. One of my areas of interest here has been the work that the Alberta Research Council has been doing on weather modification. I just wonder if there is any activity at all being conducted during this budget year in the whole area of weather modification and hail suppression. Is any kind of entity being kept operating within the Alberta Research Council which will preserve, sort of, our research presence in that area in the province of Alberta now that budgets have been cut in the Department of Agriculture?

Finally, a question that pertains to the Alberta Heritage Foundation for Medical Research. Mr. Chairman, perhaps I did not read the publications that have come out as thoroughly as I might, but I noticed that the great preponderance of research projects has to do with what I would refer to as active treatment and physical health. I wonder if there are any projects and any guidelines whereby there would be some balance to provide research money to projects which have to do with mental health and preventative health. I think that perhaps the submissions aren't there. Perhaps the foundation operates on the requests and the ideas that come in, but if there are those submissions, if there are those ideas and proposals, I think that there should always be a balance there in the different areas of health care.

Finally, Mr. Chairman, I note that there is an investment in pharmaceutical research, and that is certainly to be commended. I wonder if there are any identifiable products that have come out of that research and are being manufactured and marketed within Alberta. I would be interested to know whether there is the follow-through there into actual production in Alberta.

Thank you, Mr. Chairman.

MR. DEPUTY CHAIRMAN: Mr. Minister.

MR. YOUNG: Thank you, Mr. Chairman. This presents a bit of a challenge as to where to start on the few questions that have been asked. It was my intent to be brief in responses. I will have to be brief in responses to these various questions to even get through the list of questions. But let's first of all take a try at some of the questions. I will try to follow the order in which they were delivered, and I'm not sure that I'll be able to get them all, but I will do my best.

First of all, I'd make a comment with respect to ACCESS Network and its televising of the question period, that while I accept the credit -- and so would ACCESS, with gratitude -- from the hon. Member for Edmonton Mill Woods, some credit ought also to go to the budget of the Legislative Assembly, which paid something in the order, I believe, of \$5,000 for costs associated with this particular televising of the question period. I want that to go on record, as it is not particularly seen as a unique responsibility of ACCESS to provide that coverage but rather, in this case, there has been an acceptance of responsibility by the Speaker from the budget of the Assembly.

The allocation of investment or of expenditure was asked about, and as I understand it, it was one of the I think \$12.4 million. How much of that is in purchase of shares, how much of it is in loans, et cetera? The answer to that is that \$11.5 million, approximately, is in share purchase and about \$900,000, therefore, in loans. And I can say that that provision exists in the budget for that money to be paid out in loan, but it has not been issued because the companies have not fulfilled the obligations necessary for the release of the funds.

With respect to item 1.0.3, the question there had to do with financial and administrative services and why there is an increase there of 9 percent. The reason is that the definition -- and I regret this change -- and the allocation of expenditures within the department have shifted. There were some expenditures formerly in other components, other elements, which are now covered in this 1.0.3 for purposes of administrative control, ease of control, within the department. The change is explained by that change in administrative responsibility and allocation of financial expenditure.

With respect to technology commercialization, a question was asked: why a reduction in technology commercialization? I think one would read too much into that to suggest that there is any backing away from technology commercialization. I guess it depends upon how one perceives some of the items which we will shortly come to under vote 2 and whether that is technology commercialization or not. But I can indicate that we consider the commercialization of technology to be one of the major challenges of the department and that we are very pleased at developments at universities and, to some extent, colleges. But in particular, I would note that the University of Calgary and the University of Alberta both have technology development or technology commercialization offices wherein they try to create an awareness among staff of the significance of some of their initiatives. They try to assist in suggestions of how to commercialize. They provide assistance in terms of protecting the proprietary information that is there. So we believe there has been a substantial greater awareness currently than there was heretofore in respect of that area.

Vote 2.0.1 -- I'm sorry; I've got a note here and I was scratching away so quickly, hon. member. I'll take my seat if you can tell me very quickly what your question was about 2.0.1, because I didn't get it written down. I've got a note that there's a problem or a question about 2.0.1.

MR. GIBEAULT: Mr. Chairman, I was simply asking -- there's \$2.5 million in expenditure indicated there the same as the previous fiscal year. Does that indicate that the same projects are going to go ahead this coming fiscal year as last year, or are there some that will be dropped and others implemented or initiated in the coming fiscal year? And if not, if the minister can indicate just exactly what the projects are that vote 2.0.1 is funding.

MR. YOUNG: Mr. Chairman, vote 2.0.1 is an unallocated fund, if you will, primarily for grant purposes, but not necessarily for grant purposes, for small allocations, some for companies. Some of it goes to assist in the purchase, for instance, of a particular piece of equipment which might be necessary at a university for the completion of some research project. Some of it may be of a similar vein to one of the centres. But it is that kind of thing, and it is parceled out in relatively small amounts. It also was in the past used to -- if we need to bring certain people into the province for a special program, that's the kind of usage of that particular vote.

With respect to vote 2.0.2, the Alberta Telecommunications Research Centre, again a series of questions were asked about the Alberta Telecommunications Research Centre, and I guess what I would indicate there is that that centre had a sort of a rebirth, if I can express it that way. The centre is now flourishing with considerable vigour, over the last six months in particular. It has attracted the support of a number of companies, and that is in various levels. Some companies pay a quarter of a

million dollars to become affiliated with the centre. There are smaller sums. I think, for instance, that Edmonton Telephones recently developed a form of affiliation at a \$50,000 cost. Our funding, as committed over a five-year program, is at this level simply because of the configuration and flow of funding over five years.

If you want, I have a considerable amount of data which I could provide, but I think I will limit my observations this evening, or at this point in this evening, to say that the focus of the centre is on training students and staff in this particular applied area and doing research. The research is of a very applied type, and if I can describe the telephone network as this being the core network, and this being from the local exchange to the subscriber, the focus of the Telecommunications Research Centre is on this element of it: the link between the subscriber and the exchange. In that connection it is balancing between research directed at improving services, reducing costs, and increasing capacity. There is some long-term research involved, but the main focus is in these other areas. The reason for that is that when we get into trunk systems and major switches, that is a big dollar gain, and quite frankly it is the view of the Telecommunications Research Centre that in Alberta, with our distances that we have to cover and with the kinds of challenges which that presents, we can get a better return and more immediate application by having a focus as I have described it.

The hon. Member for Edmonton Mill Woods asked about the Alberta Microelectronic Centre, a whole variety of questions. The Alberta Microelectronic Centre is a two-component operation in the sense that there are components in both Calgary and Edmonton, design in Calgary and Edmonton both, but with the focus more for design in Calgary and the manufacture of reticles. That plant in Edmonton -- I think you asked had any chips been produced there. As a matter of fact, the plant has successfully produced some chips, or the component for which it has responsibility for, and has done so with -- I don't know how to express it except to say "a quality rating," which surprised people in the industry; in other words, a very high level of achievement. So I think that in that sense it is performing to expectations. Again, we get into -- well, I think I'll allow for further questions on the Microelectronic Centre, if you want to get into it in more detail.

Vote 2.0.4: again, computer software, and I've already mentioned the design role. I don't know what your other question was, but I may have to leave that and let you raise it again.

MR. GIBEAULT: Why a 30 percent cut?

MR. YOUNG: Oh. Where you see in respect of any of the centres or institutes a change in funding flow, it is representative of the configuration or the schedule of funding flow that was built into the original commitment. Normally, that is not a level flow of funds, and the goal in all of these instances was to try to make these centres and institutes self-sufficient over a period of five years. Some of them may not achieve that, but in the interim, at least to this point, I think that all of the dollars that you see are quite faithful to the original contracts with those establishments. That may answer a series of questions. That's the explanation, by the way, for the supercomputer in Calgary, item 2.0.5.

With respect to 2.0.9, satellite receivers, the program of provision of grants was an incentive for schools and communities to access the network, if you will, and it had, we believed, satisfied quite a bit of the demand that was there. The demand, I think,

was deemed to have tapered off, at least by way of flow of applications in a normal sense, until we announced the termination of the program. Then there was a flurry of applications at that point, and all of those which came in prior to the deadline are being honoured. I'm sure there will be some others who have not got that facility, and for whatever reason didn't, within the time frames of the operation of the program, make an application. Only time will tell, and we'll get some reaction on how many of those people there may be, or those situations.

Vote 2.0.11 refers to an arrangement with one company. That's computer software development. It is for the development of a fourth generation geophysical, geological interpretation system, almost -- in fact I think it is all software. The amount of \$500,000 completes an agreement made June 20, 1986, and involves the purchase of shares. It is the conclusion and totals \$1.5 million, and it is with Teknica Resource Development.

Item 2.0.13: I wasn't quite clear on all the questions being raised there, but SPURT Investment Fund is an investment fund being managed by Alta-Can Telecom Inc., and has investment in it from a number of companies, as well as government, and as well as the Alberta Research Council. It is for support of quite speculative or quite high-risk technological development areas or companies at stages of proving the research through, especially at the bench level, if I can use that expression for it. But it's in the pre-commercialization area. The fund will be treated as a closed-in fund and in a period of -- I can tell you in just one second. I think I can. The fund is a closed-in fund, and -- my notes don't say. But in any event, I think in five years' time or seven years' time, at the end of seven years it will be closed-out, and all of the assets of the fund and the return to the fund will be apportioned to the original investors. The purpose of it is seed capital in relatively small amounts which would not in the normal sense I think be considered to be a commercially viable approach to high-risk investment.

With respect to the multi-tenant research park -- I'm sorry; I have forgotten your question. Do you want to give it to me or shall I give you a general answer?

MR. GIBEAULT: I was asking, Mr. Chairman -- here we're being asked for an allocation of \$2.8 million, a sizable amount, and this was announced some months ago. I wondered if the minister could give us an update on the status of those facilities?

MR. YOUNG: Yes, I can. First of all, the provincial government funds, public funds flowing through the provincial government, have to be matched in some respect by funds otherwise obtained by the research parks. Edmonton's facility is proceeding and I think it's partly under construction -- just commencing construction, I gather. The Calgary facility is still in the discussion stage as far as the contract with the government is concerned, and I think, as a matter of fact, in terms of raising the necessary local funds. So my guess is it will be the better part of a year before there is activity in one of these facilities.

With respect to 2.0.15, that refers to advanced genetics research. I think your question -- and the funding there, by the way, is to a company located in Calgary by the name of Alberta Genetics Inc., and it was used for the purchase of preferred shares. It deals specifically in livestock embryo transfer, and cloning I guess would be an expression to use, or reproduction technology. You asked whether that research would follow national guidelines, and I am confident that I can say unalterably that the company will be very scrupulous in observing whatever

research guidelines there may be in this respect. Because first of all, it is dealing in an international marketplace, it's got a very good reputation to maintain, and there is a transfer of technology, research, and information from the medical field into, if I can put it this way, the veterinary field in this particular instance.

With respect to Chembiomed, which is the company to which 2.0.16 refers, I'm not sure what your question was there -- I think about the increase. Again, that is just pursuing or executing an agreement earlier arrived at under the arrangements with Chembiomed. It's part of a multiyear contractual arrangement.

I would advance these observations with respect to your question: is one of the criteria job effectiveness for all of these areas? There is consideration given specifically now to every one of these applications as to what the job creation will be, both in the near term and the longer term, I know that you appreciate how difficult the circumstances are for PhDs and other researchers, and we are trying to maintain, obviously, the best of those researchers. When you speak of "Is there a job implication?" there certainly is in that sense. But I would have to add that we also look at the growth potential and whether any of these applications can lead to, for instance, export or other development and how they relate to companies or research in the same field, because we try as much as possible to look for synergism. We also require that there be a considerable portion, in most cases, of proprietors' private investment in any of the companies that are funded.

I would like to take the opportunity here to add that it is important that we not look at technology and research just in terms of new industry. We ought to be very concerned to assure that our existing industry, particularly agriculture but also oil and energy, keeps up to date and is on the cutting edge of the developments for those established industries, I think that's very, very important, because we have been much helped through the recent recession by the fact that we have so many very talented engineers who, through the better days of the energy industry, developed and honed their skills to a very high degree, I don't know how many members know, but we have in Alberta roughly 20,000 engineers, which gives us, going from memory, almost twice as many engineers per thousand of population as is usually found in North America. So we have a very major bank of talent, which is quite unique to our province.

You asked about technological opportunities in Europe. We have, in fact, had involvements with three or four Alberta companies, encouraging them and assisting them to go to Europe to discuss research-sharing opportunities. So if your concern was whether we were aware of the program and active in it, the answer is yes.

You asked about Chinese exchange students and scientists and could that be broadened. I suppose it could be broadened, but I think I would want to reflect what I believe to have been the driving force in the current exchange, and that was the twinning, the extensive work that's been done over a period of five or six years to get a foot in the door to the Chinese market and Chinese community and try to build bridges. I don't know that that same need exists in some other parts of the world. Surely it does in some, but I suspect that China, because of its sheer size, because of the lack, if you will, of intercourse with the rest of the world, would present a pretty unique situation.

You asked about the Alberta association for telematics. There has been some involvement with them through Junior Achievement, the library association, and some other contacts

trying to link computers and telecommunications.

You've expressed a concern about the employment of PhDs. I think it would be fair to say that we're concerned about the employment of any individual, regardless of their particular talents and training, and no less so about PhDs. I think we gave some explanation of shifts in programming and of reductions. There is a very fertile, vigorous, and vital community in Alberta of researchers and educators. We're aware of that. We believe very strongly that that's one of the great strengths of the province, which has enabled us to create as much technological development as is now occurring. So we're very much alert to the concern you have raised.

You raised a question about the Auditor General report on the Alberta Research Council and the question of partnership and the limitations of the existing statute. The actions taken are these. First, I am having that checked by our own Attorney General staff to see if our interpretations of legalities are concurrent with the interpretations of the Auditor General's staff. If they are, then we will be addressing legislation in terms of the Alberta Research Council Act, and we will also be addressing policy because there is a policy question raised. That will not be in this spring session, but I hope that we may be able to do so by the next session.

On the matter of fixed assets, that has been a matter the council has given some attention and continues to give attention, I think one can say more assiduously now than in times past, because the big focus was on getting new facilities and changed facilities, and with that work behind it's easier to get on with some of these other tasks.

Mr. Chairman, you have indicated to me that I've run out of time. I haven't run out of questions; I've still got several pages. So it is up to the Assembly. I've been trying to move speedily through those questions, but there were a lot of them from the member.

MR. DEPUTY CHAIRMAN: The Member for Edmonton Meadowlark.

MR. MITCHELL: Thank you very much, Mr. Chairman. I would like to begin by saying that I'm always impressed by the minister's diligence in answering questions and his manner in doing that. He always makes us feel that our questions are actually worth asking.

AN HON. MEMBER: Like all of us.

MR. MITCHELL: Well, some of his colleagues do that as well; they can't all claim to do that. And I think that most of us on this side of the House, having acknowledged the diligence of his effort, would find it acceptable that he submit answers to these questions in writing afterwards so that we can ask further questions and make more comments as the case may be.

Last year I recall speaking on these estimates and being quite positive about the initiatives of this department. I am still positive about many of the initiatives of this department. I think the Alberta telecommunications research council is perhaps at the forefront of this industry in the way it has been structured and in some of the things it has accomplished. I believe that the Microelectronic Centre's initiatives are equally inspired and truly are achievements about which this government can be quite proud.

Having said that, however, I believe that to continue to be positive would be to repeat myself, because there is little new

about which I can be positive. I believe that this department's past record is acceptable and represents significant achievements in many respects. I am concerned, however, about the future. And in stating that, I believe I address a broader problem of this budget, of which this minister is as much a victim as perhaps the people of Alberta and the future development of this province.

We have a one-track budget, a budget that represents no investment in the future, and nowhere is this more evident than in the case of this department, the Department of Technology, Research and Telecommunications, which is fundamentally a department of the future of this province. It shares that distinction with the Economic Development and Trade Department and the Department of Tourism, as it does with the two departments of education. But when it comes to economic development and the need to diversify our economy and the need to be creative and innovative into the future, the responsibility for that falls upon the shoulders of this minister and upon his Department of Technology, Research and Telecommunications. This budget and the estimates of this department, in being cut as they have been, represent a dismal failure in the ability of this department and this minister to rise to this challenge and to meet this responsibility in the way that it must be met at this time in this province if we are to have a prosperous, aggressive economic future and therefore a social future as well. This budget not only has been cut but also reflects a failure by this department to aggressively confront its mandate to diversify this economy, to broaden this province's economic base.

[Mrs. Koper in the Chair]

Let me give you some statistics to argue my case. The total budget of this department will be \$72.5 million for 1987-88. Of that, \$21.5 million goes to the Alberta Research Council. The greatest focus of the Alberta Research Council is on agriculture, energy, natural resources of various kinds. This does not reflect diversification. Despite the fact that these are in and of themselves worthwhile initiatives, they do not reflect diversification. Another \$15 million of this department's budget will be allocated to ACCESS. While ACCESS has many redeeming qualities and makes a tremendous contribution to the broader concept of education offered by this government to the people of Alberta, it does not represent diversification.

Excluding those two sections of this department, we are left with \$36 million applied to science technology research initiatives which could in any way be construed as representing real diversification. Let's compare that to the amount of money we put into economic development in other traditional sectors of our economy. Two billion dollars was committed to farmers over the last year. I'm not criticizing that commitment; that's an excellent idea. By comparison . . .

AN HON. MEMBER: They never gave it to them. They lent it to them.

MR. MITCHELL: Lent it to them. By comparison, \$36 million pales. Two billion dollars has been accorded to the energy industry in the form of a royalty tax reduction. By comparison, \$36 billion pales into the negligible. Five hundred million dollars was provided as an incentive to drilling programs last year in the energy industry. One hundred and forty million dollars has been put into the energy department alone this year.

Thirty-six million dollars into real diversification initiatives

under the technology/telecommunications research rubric is negligible. It will not accomplish what has to be accomplished for the future of this province in terms of economic diversification. Imagine for a moment if we made that level of commitment to science policy, to research and telecommunications policy. What a tremendous initiative that would be. What results could we imagine? What steps and successes could we achieve in diversifying our economic base?

Ontario has just announced a \$1 billion centres of excellence program. There is something to be learned by that. I believe that we shy away from investment in this area in an aggressive way for a number of reasons. We view energy so positively. We accept it. It is a traditional and conventional way that we view the world. It is easy to accept investing in it, and we say that we can put money into drilling programs because they are investment in future revenues for this government. Successful technological investment becomes investment in the future in the same way and will result in revenue returns to this province through income taxes due to job creation -- long-term, stable job creation -- through corporate income taxes due to the success of corporations in this new, evolving area of the future.

We have no problem looking at risk positively when it is considered in the context of the energy industry. Risk is something that wildcat drillers accept. It's a way of life. It's something that we eulogize. It becomes a legend in this province. When we view risk in the telecommunications/high-tech area, however, we seem to shy away from the fact that investment in a certain high-tech enterprise which doesn't work is no worse than an investment in a well that is dry. We know that if we drill enough dry wells, the law of averages has it that we will hit oil. The same is true in the research and development area. We have a sufficient number of failures; we are only getting closer to successes. If it's six or seven or eight or nine or 10 failures, those simply mean that we are one failure closer to success, and the law of averages in that industry dictates that one success will more than pay for the failures that are required in order to achieve that success. I believe that we have to look at telecommunications research technology under this department as a new frontier, a new area of risk, and it must become an area of risk that we eulogize and that we create as an legend in this province.

There is, I believe, in this government no vision of science policy. There's no co-ordinated approach, there's no true direction, there's little creativity, and there is precious little financial commitment. There seems to be little measure of success, little excitement in that success, and perhaps the level of success is directly proportional to the level of financial commitment, which is dismally small.

I would like to provide further comments structured around what I believe to be 10 or 11 elements of a science policy that need to be addressed, some of which are addressed in varying stages of depth by this government, to create a comprehensive science policy that can work in the '80s and the '90s and into the next century in this province. This policy must address infrastructure needs.

The government has made a commitment this year of \$2.8 million to research park, multi-tenant facilities. What will that provide specifically? Will what it does provide be enough? How are the needs for these facilities assessed? What is the policy focus behind the facilities that will be provided? Specifically in Edmonton, with respect to the electronics industry, we are not meeting the day-to-day infrastructure needs of that industry. The city requires a circuit board shop. It requires a cir-

cuit board layout and design centre. It requires a local inventory of components and a metalware shop. Could the minister please comment on his plans for providing this kind of infrastructure for the electronic sector in Edmonton and for meeting similar needs for this industry in Calgary, where those needs are not being met by infrastructure provisions?

Secondly, this science policy needs a marketing assistance component. There is no commitment, as I can see it, to high-tech marketing in the department's estimates. There's \$1 million in Economic Development to marketing assistance to a range of entrepreneurs in this province. One million dollars is almost negligible and, given that it's in another department, probably not particularly accessible to the initiatives undertaken under the rubric of this particular department.

There's \$1.6 million available to assist exports. Again, that's in the economic development department, and perhaps what's worse is that it's been reduced by 53 percent. Could the minister please indicate what access programs that come under this department have to those two funding mechanisms, whether there are additional funds within his department somewhere that we have missed beyond the technology commercialization vote, which I am led to believe does not address marketing as much as it addresses the process of getting a product from the research design stage to a commercial stage? It is extremely important that the area of marketing assistance be addressed. One of the fundamental difficulties in developing a high technology industry is taking the ideas of technical individuals and turning them into entrepreneurially successful ideas. Marketing is an important component of that formula.

The technology commercialization vote addresses an important area of science policy. Yes, it is essential to find ways to get researchers with ideas to entrepreneurs who can market and develop those ideas and make them commercial. The commercialization vote has been reduced. Could the minister please indicate how it is that that reduction is consistent with the demands in this area?

I would like to speak briefly for a moment about a constituent of mine who, coming from eastern Europe, has brought with him an idea to sterilize water. It's an idea that would do that much more cheaply than current chemical methods, and, for example, in the case of sterilizing water in swimming pools, much more pleasantly for those who swim. It's also an idea that has applications to the sterilization of meat or to the cleansing of meat. This constituent has had tremendous difficulty finding any kind of success with funding for that idea, with technological expertise for that idea, with assistance in getting it through the federal government, the standards, requirements of the federal government before he could even begin to market let alone further develop that idea.

[Mr. Musgreave in the Chair]

The fourth area of science policy: we require a clear-cut policy on the relationship of ideas funded by the government, created through funding by the government, and government return revenue income from those ideas. The Alberta Telecommunications Research Centre is a classic example. If I'm not mistaken, companies contribute to the activities of that centre. The university contributes to it, and judging by this budget, the government contributes to it in the order of \$772,000 proposed for next year. I am led to believe that any idea that is created by the Alberta Telecommunications Research Centre can be picked up by any of the contributing companies. Those companies can develop

those ideas without having to pay any royalty or without having to commit to any equity share by the government that has funded significantly the process which has developed those ideas. Similarly, there is no requirement on the part of the companies that undertake to develop those ideas to produce the product in Alberta, to create the jobs in Alberta, to make the investment in Alberta so that we can enjoy the spin-offs and the consequent economic development that's inherent in those kinds of activities.

I would specifically like to ask the minister whether he is considering a policy in this relationship. If he has one, what is that policy? How would it apply to the Alberta Telecommunications Research Centre initiatives, and how would it apply to the case earlier this year or late last year of the special grass seed that was developed by a professor at the university? I believe that there was a tremendous price involved in the sale of that grass seed. I would like to know whether Albertans, the government of Alberta, the University of Alberta, beyond that professor, benefited in any way from the development of that seed and its subsequent commercialization.

Fifthly, it's extremely important that the government focus on finding areas of competitive advantage or areas that are simply forgotten in the high-tech development world. The Alberta Telecommunications Research Centre has premised its work on exactly that. They have found areas that are not being considered by other researchers in the world, areas that they believe to therefore have some potential for development, and they're experiencing some success in approaching the high-tech world in that way. I am jumping to the conclusion that the research, planning, and co-ordination vote, 1.0.4, would be the area of the department under which that function would lie. I am concerned therefore that this particular area has been cut 15.5 per cent. It seems to me that this could perhaps be the most important function of the department, a department that should be creating a vision of the future in the area of research and development. It should be identifying for the various sectors of our industry -- entrepreneurs, the university -- working in co-ordination with the university to identify areas of opportunity for the future.

I get a sense, in looking at this department's budget and in reviewing some of that which I know about its staffing, that it may be a department that is focusing on management rather than on creativity and innovation in the way that it might. I'm impressed by the record of the deputy minister, Mr. Broadfoot. I know his work elsewhere to have been competent and capable. I know him to be a competent and capable manager. I'm not certain that he brings to this department the kind of technological, scientific research background that might be required, whether or not he personally needs it. Could the minister please confirm that that function is supplemented in this department to a level that would be acceptable in the minister's estimation? This is not a management department. This is a department that must focus on creativity and innovation and a vision of the future.

Next, there is an important relationship that science policy by this government must encompass with the university. There have been some tremendous successes. The Alberta Telecommunications Research Centre, the Laser Centre: these are initiatives that are a model for the future, a model in creating a successful relationship between governments and universities and industry in developing initiatives for the future. Is there room for more? Is the government considering other such centres? There are a range of them; I know that. Has the government got

plans for creating further such centres in the future? I believe that there is a role for universities in this province to analyze what is working in these centres, what is not working in these centres. Is it not time to perhaps assess that from an objective, academic, theoretical point of view?

A further question that university academics might be able to consider is the relationship between the scientist and the entrepreneur. At what point does a technological idea, a new idea, become economically feasible? At what point does it become an idea with commercial potential? How do we make that jump? How is that being done elsewhere in the world? How do we create high-technology entrepreneurs? There is a real conundrum in education for entrepreneurship in the high-technology area. I think it can be said that technical education doesn't necessarily create in the people being educated the kind of general perspective and vision that is required of an entrepreneur. At the same time, an entrepreneur's more general focus doesn't necessarily lend itself to the creation of technological ideas. How is it that these two can be married? How is it that we can educate people in our universities and our technical facilities to make the jump between technical expertise and entrepreneurial initiative? What is the relationship between a successful science policy and a science and engineering education?

The minister made the point that we have a particularly high per capita ratio of engineers, research scientists, compared to North American experience. What about compared to the Japanese experience? In Japan today there are in the order of 350,000 research scientists and engineers. In Canada in total there are 14,000. That's extremely small compared to the relative size of our populations. Japan is particularly successful in its industrial innovation, an industrial innovation that goes somewhat beyond simply a narrowly defined sense of high-technology innovation.

Next feature of science policy: the relationship with the federal government and other provinces. This, of course, is critical. The three successful technological centres in this country -- Montreal, Toronto, Ottawa -- can all be grateful in a great degree for their success to federal government commitments to invest in high technology in their areas.

ANHON. MEMBER: The largesse of the former Liberal government.

MR. MITCHELL: With great success by the former Liberal government, in fact.

What is the implication for the much-touted western diversification policy that we all await with bated breath from the federal Conservative government for high technology development in Alberta? What is being done on the part of this government and this department to have input in the development of that diversification policy? What has been learned by this government? Perhaps the minister could comment on the CF-18 fiasco. It was clear that very little of this department's resources were put to negotiating with the federal government to establish that the CF-18 contract should go to Manitoba because that was where it should properly have been allocated, economically should have been allocated. And more than that, there were spin-off benefits in the allocation of that contract to Manitoba for economic research and development in Alberta. What is being done in the future for projects of this nature? Has the minister a policy, an initiative? Has he assigned somebody in this department to watch for this and create a strategy?

There is a federal/provincial relations agreement on science policy which is being negotiated. I'm not certain whether it's been signed; I think it hasn't. Could the minister please inform us of the status of that agreement? What has been our input, the process of it, our position on it? What will this agreement do? For example, will it pick further regions? Will it identify focuses and directions for federal government spending in the area of science policy, high-technology research in Alberta?

It's important next that science policy not only emphasize new initiatives but also have a clear focus on retaining existing high-technology firms. The government should be congratulated, I think, although it's difficult to get the details of its bailout of General Systems Research. I would like to emphasize that, in nature, perhaps is the kind of risk that a government has to take on behalf of a high-technology entrepreneur. General Systems Research has played a tremendous role in the development of high-technology initiative in this province. It's been a long haul. It represents the difficulties that can be encountered. The government has struggled. It's to be congratulated for having done so.

What happened, however, to the Bell-Northern Research project here? Why did it leave? Was it possible that this government made commitments to purchase technology and product from that company through that project. If so, what was purchased and why not enough? There needs to be a co-ordination role in our science policy. There is a sense from the outside, I think, of competition amongst the various centres that have been set up by this government in this province. Planning co-ordination, once again, has been cut by 15.5 percent. Will this co-ordination role suffer further? Ontario has established a special council on innovation for the future. It's a model that we perhaps should study and emulate. Could the minister please make a commitment to doing that?

Finally, this government has to view as paramount importance its financial commitment to science policy. That's not evident in this set of estimates. This department's budget has been cut. This is one department's budget that should not be cut. This is a department that is an investment in the future. Internally one can question the priorities that are evident in the cuts and increases under vote 1. What's been increased? Human resources. What's been increased? Corporate and public relations. Public relations has been increased. What's been increased? Financial and administrative services. What's been decreased? Research planning and co-ordination, technology commercialization. There is a fundamental error in what those increases and decreases represent by way of the priority commitments of this department.

Finally, this government has to have a very clear focus on how it intervenes in science and technology. I think it's had some successes in that respect; not enough, but it cannot confuse intervention with competition. I raise the Altel Data case; it's no longer Altel Data; it's somewhere else in that department. Altel Data sells computers, sells software and software in consulting services as well in direct competition against the private sector. If we are to develop that area of our high-tech industry, it seems absurd that we would compete in the way that AGT competes with private-sector entrepreneurs in that particular area of entrepreneurial endeavour. Could the minister please indicate what is Altel Data's budget -- or its new counterpart in the department -- what is its revenue, what is its profit, and why it is that in any sense that would be a necessary endeavour for government?

MR. YOUNG: Mr. Chairman, very briefly, given the hour, I'd like to make a few comments before the committee rises.

First of all, with respect to the questions which are raised by the hon. Member for Edmonton Mill Woods and his comments about the provision of educational services supportive of teachers and students, I want to just say that I covered that in my opening comments. I indicated that if one looked at the previous system and the manner in which it was apparently being used, it was not an efficient system -- it was not co-ordinated in a manner which took into good account taxpayers' funds from different sources -- and that the existing system proposed to download programs by a television transmitter which is already in place and therefore has almost nil additional costs for operation for that purpose, with advanced indication to schools as to what programs will be downloaded when, is the most efficient system there could possibly be. And if school systems organized properly for those programs that can be transmitted in that way, it should actually be cheaper for them because they don't have to run to and fro the bus depot or wherever else to get the videotapes. They'll be able to record them on their own equipment at no more cost than prevailed earlier.

With respect to a telecommunications policy there were a couple of questions raised, and I want to mention it very briefly. I think the hon. Member for Edmonton Mill Woods was talking about the concept known as local measured service when he asked about toll for local service. The fact is that telecommunications is becoming so important now and has so many uses in different ways that it's possible for subscribers to tie up the telephone line for a very long period of time. There must be some way at some point to try to have a user-pay element in the telephone charges. And quite frankly, in those areas where local measured service has been introduced, it has for well over half of the subscribers had the net effect of lowering the cost to subscribers. For those who call relatives for brief periods of time or use a telephone in that manner for minor business reasons, it has resulted in lower charges. So before we get all excited about the possibility of local measured service resulting in higher cost to subscribers, we should take a long look at how we're going to ever control and balance fairly the cost for telephones if there's going to be the continuing trend now evident of more and more extensive use by certain subscribers at no additional cost to them. Somebody has to pay some way for the increased capacity, and for those who don't increase capacity and don't use it, then the charges will be reduced or not increased under local measured service, presuming it's introduced in a fair and equitable manner.

The question from the hon. Member for Ponoka about the additional care in the selection of tapes: I think the point was that you'd like to see a better and more comprehensive description of the tapes so that schools could order with better knowledge, and I'm sure that point has been noted.

With respect to distance education: that is a challenge, to try to relate, and I will accede to the point being made. I think that across government we have not co-ordinated the effort to the degree that could be achieved there, and I accept the suggestion that we do better.

With respect to whether the department has any role in cable licensing, imposing any conditions, I think the answer to that is no, there is no role. And as a matter of fact, we're often in situations where there can be competitors for a particular location, and we try to avoid favouring any situation.

With respect to the people who have purchased their own private lines and what will happen to them when the individual

line service comes in, the application by ACT to the Public Utilities Board indicated that they asked to have those charges discontinued effective April 30, 1986. So that's last year, about a year ago now. So if the Public Utilities Board accedes to the request of Alberta government Telephones -- and in this sense the expression of government policy -- the charges will be reimbursed, in my understanding, that have run for this last year for those people who took out individual line service prior to April 30, 1986.

Why not extend EFRC further and faster? Extended flat rate calling gets us back into who pays for the system. There are questions there which today I can't answer. I can indicate that the intraprovincial long-distance charges are a significant component of AGT's revenues, and the more extended flat rate, the more reduction in those revenues. Somebody has to pay. Additionally, there is the addition -- with every extended flat rate route there is always a surge in demand on the route, and that surge is a multiple of former usage so that additional capacity has to be built in to accommodate the additional talking that then goes on. Because it's a free good at that point from their point of view.

Weather modification. Is any kind of entity being kept at all at the Research Council? A very small component of the senior researchers. I think two or three are being kept for this year to clean up work and process data that have been generated earlier. Whether or not they will be continued on much beyond that in that kind of activity turns completely upon the budget situation and the priority given to that particular program. But the current intention is to wind down and terminate that program.

With respect to the Alberta Heritage Foundation for Medical Research, what about mental and preventive implications or applications? I think they are very much in the minority of the research applications that have come forward. However, I don't know how one would classify Alzheimer's and some of those related diseases that are being worked upon, so it certainly isn't exclusively to physical illness type problems. I think this is now an area recognized as being one that needs some more balance, but to this point the applicants, I think, have not come in the balanced fashion that the hon. member would like to see.

With respect to pharmaceuticals and the developments of pharmaceuticals. Chembiomed is a spin from the University of Alberta and the research done in the biological, pharmaceutical, and chemical areas. There are at least four other companies now in an emerging stage from the university. Taiho Pharmaceutical will be over here next month -- next month being May -- to formally sign the agreement establishing a new pharmaceutical company on a partnership basis with this Japanese company because of a researcher at the University. So that is one of the very promising areas. I don't have time to get into it tonight in detail.

I wanted to make a very few -- very few -- comments in respect to some observations by the Member for Edmonton Meadowlark. First of all, I want to indicate that the amount of research in Alberta, if one just examines research and science in Alberta for the year '84-85 -- this is StatsCan, and this is expenditures on scientific activities by selected provincial governments: for Alberta, \$240 million; for British Columbia, \$57 million; for Manitoba, \$33 million; for Ontario, \$245 million. Ontario \$245 million: and if one thinks about their multiple of population in relation to ours, what this really means is what we've been saying all along, that research in this province has

been funded far better than in any other province of Canada. You can measure it on a per capita basis. And I think that should be kept in mind when we talk about Ontario's program of \$1 billion over five years. Even if they do it, they will still not come close to the kind of funding in relation to population that we have in Alberta.

I will acknowledge the point that we want, I want, the government would like to have and would like all members to share in this objective, a culture of science, if you will, in our province and in Canada. And that's also one of the objectives of the national science policy. That will come about only if we can gain a better appreciation of the achievements already under way in the province, and they are many. There are a number of what I call the "lightning rod" companies. Chembiomed is one; General Systems Research is another; LSI is yet another. Those are companies that have so much pizzazz, so much vitality that they attract into Alberta a variety of people, from researchers to companies that use their products on an international scale to companies that have problems and think maybe they can get them solved here. And when those representatives come to visit one company in Alberta, they gain an appreciation for the general milieu and scientific research support that is available through our universities and centres in the province. By doing that they contribute a very great deal to marketing and awareness, and I think that is a very important point to have on the record.

In terms of return on investment, I don't want to get into it except to say that we have striven in all of the cases where we fund companies to try to assure that we have a means of recouping that investment, presuming the success of the company. In our situations where we take shares, the obvious way is the appreciation in the share value, because we buy those shares at a relatively low price compared to what they would have otherwise.

Mr. Chairman, I don't have time to get into a lot of other questions and points raised; I simply want to say that we are dedicated to improving job opportunities both in quality and in quantity through the technology developments, and that dedication remains undiminished. We believe we have a very powerful base on which to build because of the stature of our universities and because of the initiatives already taken which are provided for on a continuing basis in our budget, and there are some funds there for added initiatives.

Mr. Chairman, I move that the committee rise, report progress, and beg leave to sit again.

[Motion carried]

[Mr. Speaker in the Chair]

MR. MUSGREAVE: Mr. Speaker, the Committee of Supply has had under consideration certain resolutions, reports progress thereon, and requests leave to sit again.

MR. SPEAKER: Having heard the report and the request for leave to sit again, does the Assembly agree?

HON. MEMBERS: Agreed.

MR. SPEAKER: Opposed? Carried.

[At 10:37 p.m. the House adjourned to Friday at 10 a.m.]