[Chairman: Mr. Kowalski] [10:02 a.m.]

MR. CHAIRMAN: Good morning, ladies and gentlemen, and welcome to another meeting of the Standing Committee on the Alberta Heritage Savings Trust Fund Act. This morning we have two gentlemen with us representing the Alberta Heritage Foundation for Medical Research: the chairman of the board of trustees, Mr. Eric Geddes, and the president of the foundation, Dr. Lionel McLeod. Gentlemen, welcome.

Perhaps I might introduce the members of our committee to you. I'll begin on my extreme right with the Leader of the Opposition, Mr. Notley, representing Spirit River-Fairview, Mr. Ray Martin from Edmonton Norwood, Mr. Bud Zip and Mr. Stan Nelson from Calgary, Mrs. Shirley Cripps from Drayton Valley, Mr. Rollie Cook from Edmonton, Mr. John Gogo from Lethbridge, Mr. Henry Kroeger from Chinook, Mr. John Thompson from Cardston, Mr. Alan Hyland from Cypress, and Mr. Ron Moore from Lacombe.

Your presentation today is really the first opportunity you've had to represent the Alberta Heritage Foundation for Medical Research. Earlier this year you issued your first triennial report, covering the period 1980 to 1983, and in recent days a copy of the report was recirculated to all members of the committee. It's always been our tradition to invite those who appear before us to present an overview of the work of their foundation. We would ask you to do that, gentlemen, and following that we'll go to questions from committee members.

MR. GEDDES: Thank you, Mr. Chairman. Good morning, ladies and gentlemen. I would first like to tell you how much we have looked forward to this first opportunity to appear in person before your committee in order to report to you and through you to the Legislative Assembly of Alberta. I am accompanied this morning by Dr. Lionel McLeod, the president of our foundation, who will join with me in providing responses to your questions. At the conclusion of my opening remarks, Dr. McLeod will summarize our programs, their purposes, and the progress to date.

I'm sure you'll be interested to know that Dr. McLeod, a native Albertan, is a graduate of the University of Alberta's medical school. He was formerly Dean of Medicine at the University of Calgary and was one of the principal architects in the development of what has emerged as one of Canada's outstanding medical schools, one in which we have a great deal of pride. He is currently completing a two-year term as president of the Royal College of Physicians and Surgeons, one of a very small number of Albertans who has ever held that prestigious appointment. I am glad to report this morning that Dr. McLeod has made a very significant contribution to the success of our foundation through his very strong leadership. I am sure you would wish to have that acknowledged on the public record.

Ladies and gentlemen, as you will know, the objects of our foundation are to establish and support a balanced, long-term program of medical research based in Alberta, directed to the discovery of new knowledge and the application of that knowledge to improve health and the quality of health services in Alberta, to stimulate research in medical sciences, to implement effective means of using in Alberta the scientific resources available in medical sciences, to support medical research laboratories and related facilities in Alberta, to promote co-operation in research in medical sciences in order to minimize duplication in and promote concentration of effort in that research, and to encourage young Albertans to pursue careers in research in medical sciences.

I think the triennial report, which is in front of you, and the report for the most recently completed fiscal year, which will be in front of you shortly, should provide encouraging evidence that that mandate has been significantly achieved over the course of the first four and a half years.

In our first three years of operations, a total of $39.6 million was expended under the heading of scientific affairs. Details of those expenditures are shown in the table on page 38 of our triennial report. I can now report that our expenditures on scientific affairs in the most recent fiscal year of the foundation, the year ended March 31, 1984, amounted to a further $27.6 million, bringing the total expended to the end of last March to $67 million. These expenditures, then, have grown in each year, from $5 million in our first year to $13 million in the second year, to $21.5 million in the third year — covered by the triennial report — and to $27.5 million in the fourth year. We are forecasting a significant increase in expenditures in the current year, ending March 31, 1985, when expenditures on scientific affairs are estimated to be $40.36 million, an increase of some 50 percent over the 1983-84 year, bringing total expenditures to the end of the current year, the year in which we are now operating, to a total of $100 million since the foundation was first established.

In the final five years of this decade, expenditures will increase further, not only to provide for increasingly larger allocations to the traditional areas of support within our grants and award program but as well to include funds for construction of two clinical research buildings, one in Calgary and one in Edmonton. I would like to make further reference to those buildings later in my remarks. Therefore our planning horizons and our financial forecasting extend to the end of this decade, and I am sure that members of the committee would wish at this time to have some preliminary indication of our forecast of the adequacy of our endowment fund at that time.

Forecasting is an uncertain art at the best of times, and it's particularly difficult when it involves a combination of predicted investment returns from our portfolio over the future years, in either nominal or real terms, and the predicted amounts of awards that will be made in a variety of grant categories. Our forecasts therefore represent our best estimates of future events, based on the most likely outcome that is apparent to us today.

It will be recalled that the original endowment fund that was established by the Legislature amounted to $300 million. At March 31, 1984, the conclusion of our most recent fiscal year end, the $300 million endowment fund had increased by a further $118 million; hence, the accumulated amount in the endowment fund at March 31, 1984, amounted to $418 million.

In the current year, the year ending March 31,

1985, we are predicting that the endowment fund will earn a further $48.5 million in income. After expenditures of $42.2 million in the current year, we expect that the endowment fund will increase by a further $6.3 million. So at the end of March 1985, it is our expectation that the endowment fund will in fact amount to approximately $424 million.

Commencing in 1985-86, however, we are predicting that in that year and for the final five years of this decade, expenditures will increase and will exceed income by approximately $85.4 million. We will therefore have reached a crossover point in the final five years, which will see the endowment fund decrease to the amount of $85.4 million. As a result, our endowment fund at the end of this decade, unless increased before that time by the Legislature, will amount to $338 million.

In the last year of the 10-year period under review since our incorporation, the income from our endowment fund is forecast at $39 million, while expenditures are forecast to be $54.9 million; hence, in the 10th year there will be a shortfall of $15.9 million. That shortfall, or difference between projected income and expenditure, will increase significantly in the following years unless the endowment fund is increased. If we are to maintain expenditures at the minimum level of $55 million — and that is the amount of our predicted outlays in 1989, based on the assumptions described earlier — and see the level of expenditures grow throughout the next decade, it will clearly require that the endowment fund be increased in order to maintain the integrity of our program of grants and awards in the decade of the 1990s and beyond. So, ladies and gentlemen, I think I can safely predict that the question of our endowment fund will be a matter of great importance when our foundation appears before you at the time of our next appearance in 1987.

Our reports will indicate to you significant allocations that have been made available for personnel support, for establishment grants for scientists at Alberta universities and, in limited instances, Alberta scientists studying at other universities. To complement those programs of personnel support, we have expended significant sums on capital equipment. The timing of those expenditures is particularly important, coming when there has been severe limitation on the funding available from national granting organizations to Alberta universities. So our ability to provide significant funding for major equipment with the endowment fund has been a very important ingredient in the success of the programs to date. In addition to the $7.9 million expended on major equipment in our first three years, a further $5.7 million was expended on major equipment and maintenance grants in the year ended March 31, 1984, bringing the total to date to $13.6 million.

There are two developments of particular interest which I would like to comment upon for your further interest. These developments are referred to in rather general terms in our triennial report, but they have now reached a state of more clear definition in their development. I am pleased to be able to provide the following more detailed information to you.

In the fall of 1983, the trustees announced a new program for clinical research which extends support to clinician scientists, all the way from studentships to the establishment of new centres of clinical research. This new clinical program is designed to further fulfill the foundation's mandate to provide a balanced, long-term program of medical research in Alberta. For many years there has been an observable imbalance between basic and clinical research throughout Canada, which has led to a very serious shortage of clinician scientists. The programs announced by the trustees are expected to play a very significant part in helping to redress this imbalance between the basic and clinical scientist.

The second recent development is related in an important way to the first development, of which I have just spoken. The second development concerns the decision of the trustees to provide institutional grants to each of the two major Alberta universities with medical schools, to permit each institution to construct between 5,000 and 5,500 square metres of net usable space for clinical research, at a cost not to exceed $30 million to $32 million in the case of each institution, including the costs of planning, design, construction, and the provision of basic equipment in each institution.

The need to provide institutional funding to the universities to develop such space arises from a shortage of a particular kind of clinical research space, which is modular in design with central support systems. Clearly such space must be located and, hence, available in close proximity to patients. That will have something to do with the siting of those facilities in both Edmonton and Calgary. Moreover, the buildings must be compatible with the needs of multidisciplinary teams of scientists, relating as well to the basic science departments located in the medical schools at the universities.

The foundation has required from the universities that the foundation's approval be obtained for a period of 10 years in respect of the allocation of completed space. Planning is well under way at the universities and, at the request of our foundation, arrangements are in place to keep the foundation closely informed of the planning and design phases in order that we can keep a close watch on the expenditures for these two buildings.

With the release in the summer of 1984 of the government's white paper on science and technology in Alberta, the trustees have given consideration to those aspects of government science and technology policy where the foundation has a contribution to make. I can say that we are very supportive of the main thrust of the white paper. We remain convinced that our foundation has some role to play, as yet undefined pending the delineation of the role which the Alberta Research Council will play in the development of innovation centres. But we clearly believe we have some role to play in fostering the commercialization of discoveries based within the university community in Alberta. The shape and nature of the programs that we will be involved with will become clearer over the next few weeks. As I have indicated, we intend to make some response to the white paper, and that response will be forthcoming shortly.

Section 23 of our Act requires that an international board of review consisting of not less than six members be appointed to review the operations of the foundation at intervals of six years after the coming into force of our Act. The Act requires that we commence that process four and a

half years after the date of our Act. I can now advise you that that four and a half year period has expired and we are vigorously at work in the process of identifying medical scientists of national and international repute to serve on this prestigious body as required by our Act. We expect no difficulties in arranging for the review to be carried out within the requirements of the Act. In the fall of 1984, we expect to be confirming appointments to that international board of review, whose findings will be reported to the Legislature at the same time as the second triennial report will be laid before you.

I would like to take this opportunity to place on the public record our appreciation for the tireless efforts on behalf of the foundation of those members of the Alberta scientific community who have served on the foundation's panels, committees, and advisory boards. This constitutes a very large number of dedicated individuals, in the main from Alberta. Their names, their representation on these panels and committees, are recorded in the triennial report.

In particular we would like to acknowledge the help and guidance of the members of the ad hoc scientific advisory committee who made it possible for us to become fully functional within our first year. I think it was a remarkable accomplishment to have our program of grants and awards in place and functioning within the first year, in full and complete co-operation with the Alberta university community. The names of those individuals are included in our triennial report as well.

Among the many outstanding individuals from the Alberta scientific community who served our foundation I would like to mention one name, the man who exemplified as much as anyone I can think of the spirit of dedication and hard work to our cause. That was the late Dr. George Ira Drummond, the distinguished Killam Professor from the University of Calgary, whose loss to us during the past year was particularly grievous.

I've no hesitation in saying that our relationships with the Alberta universities are excellent. We work in partnership with them in an atmosphere of co-operation and a sense that we are enrolled together in a very important cause on behalf of the people of Alberta. I know I speak for all the trustees of the foundation in expressing our appreciation for the opportunity to serve in the important role which has been assigned to us. As well I would like to acknowledge the exceedingly hard and dedicated work done by each and every trustee. Again, their names are recorded in the annual report.

Perhaps I could conclude my remarks by referring to just two comments received by us out of the many encouraging and supportive observations about our program to date. These are received from a wide number of sources. As you may know, one of the things our foundation does is support a great many conferences in both universities, which bring distinguished medical scientists from around the world to our province to see what's happening in this province and to gain some appreciation of the excitement felt by the Alberta academic community. We take the opportunity to speak to these distinguished visitors, to gain from them, not in any sense of trying to elicit only the favourable remarks from them. We want to know the clear and candid assessment of these people of the results being accomplished in Alberta. So I think the remarks I would conclude by offering are very representative of the many remarks which are offered to me in my role as chairman of this foundation.

Dr. Michael Waterfield of the imperial cancer fund in England has said:

> I've been tremendously surprised at the quality of science and scientists here. You have some of the best scientists in the world.

And from Dr. David Sackett of the McMaster medical school, a pre-eminent figure in medical research as it applies to medical care:

> What impresses me even more than the excellence of the Senior Scientists who have been brought to Alberta is the spirit of excitement and optimism that has been created among the young Alberta investigators who are just entering the field of medical research. Alberta and Canada will be reaping the benefits of this excitement and optimism for decades to come.

Mr. Chairman, I would like to conclude at that point and invite my colleague Dr. McLeod to provide further comments about the foundation's programs.

DR. McLEOD: Thank you, Mr. Geddes. I'd also like to record my pleasure at being here and being able to act in the capacity I have in the last few years with the foundation. It struck me that I should make an additional acknowledgment of an administrative nature. I entered the office of the foundation in June 1981 and was guided, by the nose and by the hand, by Dr. John E. Bradley. I found that an interesting experience, as my first venture into general practice was in Wainwright, Alberta, and guess who guided me into the office at that time? It was the same Dr. John E. Bradley. So Dr. Bradley not only receives much credit for the administrative structure of the college, but I also am personally indebted to him for his help in two important phases in my life.

Mr. Geddes has outlined the objectives of the foundation well. I will try to briefly summarize its programs. In our response to the objectives, we have established studentship fellowship programs, support for young people in order to try to interest and stimulate both the selection of a long-term career and also training in medical research. The second most important program, I suppose, would be the staff positions that have been created within the universities and their closely affiliated institutions which provide full stipend and support for those who are prepared to commit 75 percent of their time to medical research. It's expected that they would contribute the remaining 25 percent to teaching and other ventures which would enrich their research and keep it apace.

The principle under which we have invited our panels to function is that the brightest, best trained, with the best ideas, should receive the primary support. That should be the first judgment taken. The second judgment should be based on the environment in which they would do their research and the disciplines and approaches to disease which they would take. We've been very insistent that these individuals be able to act in a collaborative way, to be able to work in research teams and to support the ongoing development of research in the

clinical areas. As Mr. Geddes indicated, we've considered this a national if not an international problem. We consider it important to address in this province.

The third set of programs which you will notice in the publication really deals with enrichment of the intellectual community in which our scientists work and our students participate and also ensures that there is a very broad range of communication in the scientific community nationally and internationally and especially between the two centres in Alberta.

So there are three kinds of programs which I would address.

I would like to note for you that we now have supported about 900 students in Alberta in the studentship program as either full-time or part-time students, medical students who are in their medical course but are prepared to take part of their time to engage in research, and then the summer student program — the medical student, the nursing student, the pharmacy student — who is prepared to work in a medical research area in the course of their summer. About 900 students have been influenced, if you wish, by this program.

There have been some 400 postdoctoral fellows — again, experience in Alberta. These are people who have largely been trained elsewhere, who come here to gain further training, to gain the benefit of particular programs in Alberta. But I think you would recognize the important role they bring. They've been trained in other centres, so they bring the advantages, the attitudes, and new advances of those other centres to the Alberta community. This has been supplemented by visiting scientists in a varying number of ways. There have been about 54 of those kinds of people, experts who have spent three months or more in the province, some of them spending as long as one to two years before returning to their home laboratories. There have been over 600 scientists who have spent a brief period in Alberta just communicating, bringing their advances and exchanging information. That's been supplemented by some 66 conferences that have been held in the province for the same purposes. I've provided those new figures, which go beyond the triennial report, to bring you really up to date to the end of March 1983.

The equipment grant program, to which Mr. Geddes referred, has now spent approximately $12 million. It represented probably one of the most important initial programs, because in Canada the national agencies had been squeezed to the point where equipment had disappeared from their grant opportunities in order that they could maintain their personnel support. So departments like the Department of Biochemistry at the University of Alberta were functioning with ultracentrifuges which were outdated and had enormously protracted downtimes due to wear and tear. They had been unable to acquire the newest advances, especially the application of software to some of the analytical measurements that are necessary to good development.

So that was an important program. It flourished and is now appearing to diminish somewhat, I suppose as a result of the fact that we've caught up to the need. That does not, however, preclude the need for equipment funds for the new people who come in who must have a fresh start in order that they can be competitive.

As of March there were 70 to 75 new people in Alberta. The figure is a little soft, because we approve a scientist's application and then the application is implemented as that individual establishes a laboratory within the province. We don't quite know whether the five are in the province or are on their way into the province. Nine of those positions are very senior and prestigious awards that have been established at considerable cost. All the positions function under a five-year renewability clause. They are reviewed in the fourth year by external peer review, by the best people we can find in the world. Those people provide the recommendation to the foundation as to whether those positions should be renewed.

The 75 people now cover practically the entire waterfront, from biochemists, geneticists, molecular biologists, and physiologists of a number of types, all the way across to pediatric nutritionists, cardiologists, a plastic surgeon, chest and gastrointestinal experts, infectious disease — the list is almost endless. However, despite that wide range, it is very reassuring to us that they are beginning to develop into clusters or groupings of people with overlapping interests. For your interest, I would like to pick a few of those and demonstrate how they have come together.

These are generally people of multidisciplinary background. It may be a pediatrician next door to a biochemist, who is next door to a geneticist, who may be across the hall from a surgeon. One example that might interest you is the neuroscience group. This is a group of people who began with perhaps four academic positions doing research. They now must number 18 or 19 individuals. Their interests range from a clinical behaviourist psychologist who is trying to understand some of the functions of human behaviour and response to perceived images by vision, to individuals who are trying very hard to understand what happens to the light impulse that runs across the retina and is converted from a light signal to a chemical signal to an electrical modulation of a nerve which is then perceived in the brain, how the brain manages that particular incoming bit of information, and what happens when that pathway is diseased. That group also has individuals in it who are primarily concerned with motion. It sounds simple when you walk across the floor. But as all of us know, walking across the floor can sometimes become a problem with advancing age. There are individuals within that group whose prime interest is how disorder comes about in that particular group.

As I said, that group has gone from three or four hardworking, reasonably capable people who had very heavy teaching loads, to what I would now accept is a national research resource. This is probably the largest, strongest single group of neurophysiologists, neurochemists, and neuroanatomists in the country.

Another example which is a little easier for me to run over into the clinical areas, which of course is an important objective, is in the cardiovascular area. This is an important area for us all, especially as we pass 40. In this one particular centre we started with two or three struggling cardiologists, with facilities that approximated those of a modest-sized North American community teaching hospital, supplemented by diagnostic and surgical facilities of interest. Approximately $150,000 per year was spent in medical research in what has to be one of the most

important topics to man today, namely in the heart disease field. In the interim, that group has grown to the point where the foundation has made a commitment of $4 million in research over the next three years.

In addition to that, I think it's important to point out to you that the Alberta Heritage Savings Trust Fund applied heart disease program was an important base upon which this research could be grafted. The applied heart disease program, with which you're more familiar than I, was fashioned for a particular purpose, but in the process it developed a very excellent diagnostic facility. That, along with the foundation, became a major attraction to a cadre of people who have now modernized an entity to the point where I believe it to be as good as one can find anywhere.

I'd like to draw your attention to the example that I think best demonstrates the ultimate goal of the foundation. There is a man who, interestingly, was educated in Westlock, Alberta. He took his preliminary training in Alberta and appeared at some point in his career in Galveston, Texas. He is probably one of the few people in the world who can work with single cells, can pull one single cell out of the heart in the area which is the most important sets of cells that cause the heart to pump by an electrical impulse. He is able to take clusters of those cells and deal with the channels in the cells by which the cell manages its own metabolic processes, by which it manages drugs, chemicals, and so forth. In a tissue culture plate in a laboratory, he's able to take a cell or a set of cells and do some very remarkable things in manipulating how that cell manages life around it.

A heritage colleague of his is a clinically qualified person who, because of his clinical background, is interested in the whole heart and how it functions. In using an animal model, he is able to take the information coming from the basic molecular-based scientist, fashion a response of the whole heart model in an animal, and again manipulate the system to allow those new drugs to be tested.

That then moved on with the acquisition of two clinically qualified scientists who were able, unfortunately by invasive methods, to test those individuals who have irregular heart action. Irregular heart action is unfortunately one of the prodromata of sudden death, and that is one of the commonest causes of death today in people of my age. By dealing with the information from these two basic approaches and prior experience they are able to select, for the first time without by guess and by gosh, the very best medication for the particular patient's disordered cardiac rhythm. Simultaneously, another individual funded by the foundation is working at measurements that can be taken from the outside so that the patient's body need not be violated in order to gain the same information.

What's happened with this system? A number of things. One, because there's a system that runs from a single cell to the human patient, there is a great deal of interest on the part of national and international drug companies in this setting, because there they see the best opportunity to look at new drug development. That means that the Alberta citizen with a difficulty has an opportunity to be treated by the most modern medication that's available, not that which comes in having been tested in a number of other centres for five to 10 years. It's a frontier area. Number two, there is a reasonable probability that in the near future, the patient with that difficulty will not need invasive procedures but rather will be able to have the diagnosis established and the best treatment determined without invasion and the discomfort and risk that must ensue with invasion. Third, it's probably the most exciting area I can think of offhand for students and young people to enter, because it's modern, it's doing new things, and it's being run in a very high quality fashion. So student interest peaks. The best students wish to have opportunity to gain experience in that centre.

If you're interested in figures, when the centre opened in 1980 I think they examined about 200 patients that year. They now examine 1,000 patients. They come from all over the province, from adjacent provinces, and from the neighbouring provinces of the United States. They estimate — difficult figures, but they believe they have 200 lives per year that would not be in existence in the absence of that unit, and they have no question at all that they have improved the quality of life of a very large number of people. That's the best example I can give you of the impact of medical research funding across the whole range of activity.

Another example I'd like to bring to your attention was referred to by the chairman, namely the use of nuclear magnetic resonance. The foundation has now committed approximately $2.2 million for the use and investigation of the place of nuclear magnetic resonance as an imaging device for whole organs within the Alberta community. There are many NMRs about, most of which image. But this one has a special characteristic. Not only will it fashion an image of the organ — the heart, the liver — on a plate by using electromagnetic force but we are hopeful that it will also display what that organ is doing with molecules from moment to moment as those molecules go through that organ. In other words, it may be able to convert the information from a single momentary picture, a snapshot, of an organ, into a determination of the function of that organ. If it works, this will be a remarkable advance in diagnostic ability, not only within our community but elsewhere.

A final couple. One that is of great interest to us all is the application of molecular biology and oncology to research on cancer. We have now put in place approximately eight or nine different individuals who are dealing in the basic sciences that should or could lead to important breakthroughs in the cancer field. Recently, in collaboration with the Alberta Cancer Board, we offered a very senior, prestigious appointment to an individual who is one of the North American experts on the environment and its relationship to the genetic breaks that may result in cancer. We're extremely pleased with this and hope that comes to fruition in the very near future.

I've offered a few examples of highlights that I believe are of interest. I would only like to emphasize, as Mr. Geddes has, the enthusiasm and excitement that's come about in this province in rather stark contrast to the late 1970s. I think we would also have to acknowledge the remarkable co-operation of institutions and people both inside and outside Alberta, and I would like to especially mention the Medical Research Council of Canada, which has been exceedingly supportive of this

endeavour. Finally — I suppose it's my background — I can't help but point out to you the impact of the teaching of these individuals who, as far as I'm concerned, are some of the very brightest people who have ever been established in the province of Alberta. Their teaching capacity and their attitudes have to have some long term impact on tomorrow's medical practitioner, and hence on to those patients, wherever those patients might be.

I'd like to thank you very much, Mr. Chairman, for this opportunity.

MR. CHAIRMAN: Thank you very much. Mr. Geddes and Dr. McLeod, you've obviously sparked a tremendous interest in committee members. I have 12 on my list, and we'll get to that in just a second. First of all, I'd like to introduce three members who are also trustees of the Alberta Heritage Foundation for Medical Research, who are with us today in the gallery: Mr. Bill Dickie, who is vice-chairman of the board of trustees and a former distinguished member of this Legislative Assembly; Dr. LeRoy le Riche, registrar of the College of Physicians and Surgeons of Alberta; and Dr. Norman Wagner, president of the University of Calgary.

We'll proceed in this order. We'll begin with Mr. Zip, to be followed by Mr. Moore, and then 10 other members.

MR. ZIP: Thank you, Mr. Chairman. First of all, I wish to compliment the wisdom of all those who, five years or so ago, helped to formulate and launch the Alberta Heritage Foundation for Medical Research. I'm also most pleased with the excellent progress the people involved with this foundation over the past four and a half years have made in fostering medical research in Alberta and in gaining world recognition for our province in this important area.

However, I'm very concerned about the enormous burden of health care costs to taxpayers in the province at the present time. From all indications, these costs are still rapidly rising, and I wonder to what extent the Alberta heritage foundation is directing its attention to people's life-styles as they relate to health problems and costs. I don't think I need to cite too many instances. I'll just cite the instance of stress and 'hyperattitude', to put it in a layman's way, towards the way people do things, their attitudes, and of course abuse of alcohol. I'm very impressed to find out what a small amount of alcohol, 40 millilitres of pure alcohol, starts to seriously damage your liver; yet we have such an enormous abuse in this area. Smoking as it relates to asthma and allergies - and you can just go on and on. Of course these all cost an enormous amount to correct. I would like to have some response on this.

DR. McLEOD: That's a difficult question and is a perfectly appropriate one. I think most of us believe that we must pursue what has become an historical fact, and that is that the bulk of our preventive ability today has found its origin in an understanding of how disease comes about. One needs only to look at the classical example of the Salk vaccine for poliomyelitis. In fact I could even argue, perhaps on personal grounds, that the best reason for discontinuing smoking came about because individuals were concerned with why elastic tissue is destroyed in lung and hence caused it to be unable to contract after expansion, producing the classical disease emphysema. Oddly enough, the cessation of smoking and its importance to prevention in some way had its origin in a basic approach to why it was that the lung collapsed in this fashion. Most of us are hopeful that the major breakthroughs will come about by a fundamental understanding of how disease is generated within cells and organs, and hence from that information provide the mechanisms or the approaches to how to prevent the disease.

It's an easy topic to address when one considers a subject like cancer. One sees a cell. It's been growing normally, and then it begins not to grow normally but abnormally and to acquire new characteristics. It seems like an easy approach, one that hopefully is going to have a good solid answer in the not too distant future. When one looks at stress, it becomes much more difficult because it's difficult to pin down stress's effects on a specific tissue, a specific cell, or a specific set of cells as an organ. So there we are interested and have funded — again on the premise of the very best people with the very best training with the very best ideas, at least as best as one can make that judgment — individuals who are interested in research into behaviour.

The difficulty with that area and the reason it hasn't progressed as rapidly, I suppose, is that the tools, the devices, the workshops of scientists in that particular arena are very difficult to navigate. It's very hard to get a captive population of 1,000 people who are going to behave in a particularly prescribed way and compare them to another 1,000 people who are going to behave in another fashion. Unfortunately we don't behave that way. So we do have difficulty. I would only like to emphasize for you that we hope the basic technique will provide some of the greatest breakthroughs in prevention and, number two, that the foundation does stand ready to fund those programs of research into behaviour and life-style patterns which can convince the scientific community they have a reasonable, plausible chance of a good outcome.

Your point is exceedingly well taken, and we remain very interested in it.

MR. ZIP: Thank you. I have noted that certain people always seem to be visiting doctors' offices and seeking medical help. At the same time there are others who never seem to need to go. Has any analysis been made of health care claims to determine to what extent these claims are related to life-styles and to what extent preventative programs may be instituted to help enhance the health of people in Alberta and to reduce the cost of health care to taxpayers in this province?

DR. McLEOD: Mr. Zip, I took the liberty of reading the Hansard report of your meeting with Mr. Russell. I noticed he took the occasion to refer a number of questions to us. I wonder if I could refer that question to him, he having the primary responsibility. Let me just conclude my facetious response by saying we do agree that research into the health care delivery system is an important but equally difficult approach. But I would also be interested in others' answers to that question.

MR. ZIP: Thank you.

MR. R. MOORE: Gentlemen, that was a very interesting and informative overview. It was an excellent overview and answered a lot of the questions and some of the concerns that I had in mind. However, just to follow on Mr. Zip's thoughts, is there a balance between cure and preventive medical research, or do you react more to the public demand for cure?

DR. McLEOD: I think there is a balance. It is not a balance that is designed or fashioned in a deliberative manner. Unfortunately, medical research advances have not come out very well in the past by deliberate decisions to attack deliberate problems, unless you talk about the development of research in the broad fields of genetics or recombinant DNA technology or whatever. Rather, I think the balance comes in the other way. The balance comes by ensuring that the people who are interested in the curative approach and so forth are constantly working in an environment where patients and people responsible for patients are also working, in order that whatever their fundamental findings are, they will be constantly reminded that the problem is prevention.

So my answer is that by ensuring that the environment is appropriate, that those people are constantly reminded of what their main long-term goal is, I think we create a balance in that way.

MR. R. MOORE: Mr. Chairman, I appreciated the direction and the planning you've indicated to us in the demand for funding. Have you a long-term plan or long-term goals for the fund that you work towards, or are you subject to yearly policy decisions that change direction from time to time?

MR. GEDDES: Largely speaking we are responsive to the applications made to us by the scientific community, the universities principally — not exclusively but largely. Our long-term planning is really based on our best judgment of the number of scientists within each category of award that we believe ideally should be in place over the 10-year span, over the five years in the future. Our expenditure model is really geared to specific numbers of scientists in specific award categories, so we make some prediction of that.

That in turn is based upon discussions which our president and members of our advisory committees have with the medical schools as to the likelihood of major research groups being put into place in the two major centres. Consequently all our decisions about funding are a function of the predicted outcome of actions to be taken at the universities, where they are being encouraged by us to build on strengths that exist in certain areas.

So there is, if you like — and I hope this is a clear answer to your question — a prediction of the number of scientists that are going to be in place over the years to come. At least for now, we've been able to accommodate within our financial resources the expected requirements that are going to come forth from the universities.

MR. R. MOORE: Thank you.

MR. NOTLEY: First of all, Dr. McLeod, I'd like to apologize; I had to be out for your review. It may be that you covered part of this. I understand you gave a report on the space question. Mr. Geddes made the observation about a shortage of clinical research space. I am interested in what your review has been of the Walter C. Mackenzie centre. Has it been adequate in terms of the research space as it relates to the foundation? I've had some indication that there may be a shortage, or at least some dispute as to the amount of space that should have been provided. Could you give us any comment on that?

MR. GEDDES: Mr. Notley, the amount of space for research at the Walter C. Mackenzie is limited. Our review, carried out in conjunction with the universities, was that there simply wasn't in place, or under any reasonable set of circumstances could there be brought into being, space of the kind that was needed for the sorts of programs we were bent upon encouraging. Those programs, as described earlier, are programs with a relatively small number of clinician scientists working in a multidisciplinary environment, interacting with basic scientists at the basic departments at the university. There just simply wasn't space that permitted that kind of research to be carried out. It simply didn't exist. The medical research space at the Walter C. Mackenzie is very limited in any event. The requirements that emerged from our examination were for clinical research space in a new kind of setting, compatible with the sorts of thrusts that our foundation believes are important.

In addition, I might say we have expended significant sums of money to permit the universities to either renovate existing space, largely at the University of Alberta, or to complete undeveloped space at the University of Calgary, principally for the use of the basic science departments.

So there was a space problem. I think we've taken the appropriate steps to rectify it. But clearly there was a space problem and clearly the Walter C. Mackenzie did not have space which would permit carrying out the sorts of programs our foundation considers appropriate and necessary in conjunction with the opinions of the medical schools of the two universities.

MR. NOTLEY: Mr. Geddes, I don't raise this in an argumentative sense at all but to try to elicit from you gentlemen your assessment of the situation. It may be that I have misunderstood the mandate, but it always struck me that the basic argument for the Walter C. Mackenzie centre and the enormous public investment we've made in it is that it was more than essentially just the new University hospital. It had to have a larger component which would include medical research. If there are problems with the space, I'm wondering why that would be. Would it be that there is a time-frame difficulty here between the establishment of the research foundation, and the priorities that you people quite appropriately set, and the planning of Walter C. Mackenzie?

What I'm looking at is that we have a lot of public funds that we're putting forward. As members of the Legislature, I think we have to be assured that those public funds are invested in a way that gets the maximum return so we can achieve our objectives, which we all support. So I'm wondering if there was some overlapping or time-frame problem between the foundation and the planning of Walter C. Mackenzie.

MR. GEDDES: I'm not sure I'd describe it as a problem, but certainly within the first 24 months of our incorporation, I would think, by the time our attention was drawn to this issue, Walter C. Mackenzie, Phase I at least, was nearing completion. The planning for that would extend back a good many years. When our attention was first directed toward the adequacy of space for medical research in Edmonton, the construction and the final completion of Walter C. Mackenzie had reached a state of no return. As you would understand, we were not in being when the planning took place for the Walter C. Mackenzie and, for that reason, took no part. I think that's about the only response we can provide you.

Why space of this nature was not provided perhaps lies in the nature of the consultations which took place between the space planners and the medical school, and perhaps the ability to predict at that time, when the appropriate inputs could have been received, what the needs were going to be as they would emerge in the future and whether or not particular consideration was given to future needs as compared to the traditional needs of the past.

MR. NOTLEY: If you were in a position to make recommendations to us, and through us to the government, would you see changes in the planning approach to major capital construction as a consequence of the experience you people have gained?

MR. GEDDES: Certainly with respect to any research components, I would expect our foundation to have a very significant ability to provide comment and counsel. Perhaps we would have a pre-eminent role to play in planning future public buildings where there was any element of medical research involved.

MRS. CRIPPS: What is the situation of medical research in Alberta and in Canada in comparison to the worldwide situation, given the effects of the Alberta Heritage Foundation for Medical Research?

DR. McLEOD: That's a very large question. I wonder if I could ask if you could just focus that a little bit. You're interested in the impact of the foundation and the outcome of research in Alberta relative to research in similar jurisdictions elsewhere in the country?

MRS. CRIPPS: No, I'm more interested in Alberta's role in the total Canadian and worldwide situation.

DR. McLEOD: Co-operation.

MRS. CRIPPS: In co-operation and — I was going to say prestige, but that's not what I'm interested in. I guess I'm interested in our worldwide capability.

DR. McLEOD: The short answer is that it's a dramatic improvement in the sense that there are contributions now being made and flowing outward from Alberta that far exceed the outward flow of five years ago. It's an exceedingly dramatic change, and that reflects the fact that the existing scientists in Alberta have an opportunity to do more because they have more productive machinery to work with than they had. They have more postdoctoral fellows that are major contributors to the advancement of research — more people doing research and especially there are more people doing research who have a major time commitment to research. If you are a busy faculty member in a medical school funded in the usual way, you're very fortunate if you can spend even a third of your time in research. We are now funding people, insisting that they spend up to three-quarters of their time in medical research. So the productivity per dollar, if you wish, invested in an individual is much greater. There is a remarkable difference.

Compare that to other Canadian centres. If you were to take Alberta and Calgary, put them together into one unit, and compare that with other centres in Canada, I think you would find it to be on a par with anything now in this country. Calgary is a smaller school; Edmonton is a larger, older school. If you were to combine the two, I'm sure the research productivity would match anything in Canada. If you add the United States to that, rank the U.S. medical schools, you would find that that joint, amalgamated medical school of Edmonton-Calgary would have moved from probably a low mid-position to somewhere in the upper third — not the big ten and not the big twenty, but it certainly would have moved considerably up that scale.

There are now collaborative projects, research going on between scientists in Alberta, scientists in Harvard, in Stanford, in Scripps Institute, and in Texas. There are a number of collaborative programs going on where a very substantial part of the contribution is being made by Albertans. Those are the examples that come to my mind, Mrs. Cripps. I would certainly be happy to try to answer anything further that you might wish to address.

MRS. CRIPPS: Given the makeup of the advisory council — I notice it's made up of people from all over the world and some pretty prestigious medical schools — exactly what is the role of the advisory council and how does that affect the ultimate end, I suppose, of research excellence in Alberta?

DR. McLEOD: The Scientific Advisory Council has both breadth and some limits. By choice, these are very prestigious and therefore very busy people. They have a major impact by addressing the policies of the foundation, the creation of new programs, the criteria under which one would continue a program, the criteria under which you would renew an appointment, the criteria under which you would decide not to proceed with a program. They also monitor the individuals who provide specific kinds of recommendations.

Let me use an example. To make a decision to appoint a scholar to the program, an application is created by a potential scholar and the university. That application is received and is provided to three or four external referees, experts within the particular field of that scholar; they may be anywhere in the world. That's a request for a written appraisal of the application and the applicant. That application and the results of that review then go to a panel of Alberta-based scientists, drawn from both the University of Calgary and the University of Alberta, not necessarily all from the medical school. Those people do their own appraisal of the application — a multidisciplinary approach, which is

somewhat unique in North America; it's not usually done quite as forcefully — along with the external referees. Then a recommendation is provided to the trustees to fund or not to fund, and if to fund, at what level it should be funded. That whole process — the people who make those decisions, the process that's used, the criteria that are used — is monitored by that internationally based Scientific Advisory Council.

So there is a constant way of bringing to bear on the decisions of the foundation the opinions of that group of individuals from afar. I think it is comparable. It's a product of the experience of the last 20 years. At the same time, it's refined a little bit in two ways. One, as I mentioned, is the multidisciplinary assessment which is imposed upon the so-called peer review, which I think broadens the benefit of the review. I might add another factor, and that is that we do not have an administrative science staff within the foundation, such as occurs in many of the granting agencies, for the simple reason that if you do that you begin to impose the biases of an in-house scientific staff and tend to diminish the pressure and the weight that can be brought to bear by the outside world. We believe, correctly I think — I hope; I'm almost certain — that that system has some very significant advantages.

MR. GEDDES: Perhaps I could supplement what Dr. McLeod has just said. One of the things that for me has been tremendously encouraging — I know you'd like to hear about it — is the reaction of the members of our scientific advisory committee when they come to Alberta. It's the interest and dedication of these men that I find so rewarding. They're busy, productive men in their own lives, but they make a very special attempt to come to Alberta. They attend the meetings faithfully, whether it's Dr. Maloney from UCLA, Dr. Martin from Boston, or Sir Alastair Currie from Edinburgh. These are busy, important men, as you've correctly said.

In addition, what it provides to the members of the board of trustees is an important opportunity to continually gain assurance from them that we're following the right kinds of procedures and policies in a general way. We are given these opportunities on a very personal, direct level in many ways during their visits to Alberta. That's enormously encouraging to those who, like many of us, are lay people plowing new ground here. To have the ability to interact with men of this quality is a very important supportive thing to us as trustees. They've been unstinting in their ability to help and guide us in our deliberations.

MRS. CRIPPS: Thank you. That's a very useful overview. I appreciate it. By the way, I think you are following the right line.

Having been the road of hoping and praying for a medical breakthrough and given the long-term nature of medical research, have any breakthroughs been made in Alberta which could be attributed to the Alberta Heritage Foundation for Medical Research that probably wouldn't have been made otherwise, given your earlier description that you are collecting together cores of people who are working, I guess, in unison?

DR. McLEOD: I think there are some breakthroughs in one sense and not yet in the other sense. In the sense that there's a breakthrough, there have been a number of advantages brought to the patient in Alberta that were occurring in a limited number of other centres. I use the example I used in the cardiovascular area, namely the management of arrhythmias, disordered rhythms of the heart. The advantages that have been created by that group have spread practically throughout the province. That advantage was probably only present at that particular level in maybe two or three centres in Canada. I could make the argument as a clinician that, darn it, that's a breakthrough; that's a very significant breakthrough.

On the other hand I know the context of the word "breakthrough". The word "breakthrough" most often implies: have you made the acid observation that will show us the way in which a cell multiplies incorrectly and hence produces malignancy? The answer is no; I can't identify a breakthrough of that order as yet. But I can see a whole sequence of steps that have been taken by a large number of people that give me anyway, as a former — I had better use the word "former" — clinician a great deal of encouragement. It won't necessarily occur here. The information that may be gained here may go elsewhere and the breakthrough occur elsewhere. But I'm quite confident I know of people in Alberta who are going to participate in a breakthrough, whether it happens here or somewhere else.

MRS. CRIPPS: If I could editorialize, Mr. Chairman, I believe that that is the major benefit of the Alberta Heritage Savings Trust Fund foundation for medical research, in that the scientists are assured, breakthrough or not — because it's so tenuous — of continued funding.

MR. HYLAND: Mr. Chairman, with an overview such as the gentlemen gave when they started and some of the well-answered questions and the extent of the answers, it doesn't leave one too many questions to ask. I think there is one. I forget which one got into it a little bit when you were talking about equipment and facilities. My question relates to what percentage of this money is used for the operation of a program or a research facility.

DR. McLEOD: Could I ask for a little clarification? Do you mean operating costs of a facility? In my language, operating costs are the costs of the technicians, the chemicals, the supplies, et cetera. That's one kind of operating cost.

MR. HYLAND: Let's say total operating costs of a program. Do you fund the total operating costs when somebody comes to you with a program? I shouldn't say program; project is the right word. Will you fund the total operating costs, or does he have to look elsewhere?

MR. GEDDES: I think that's an important point because it raises a further important point. Our granting programs essentially provide two things to an individual investigator: first, stipend support, which is the salary paid through the institution with which the researcher is associated; secondly, we pay an establishment grant. An establishment grant is for the purpose of establishing the laboratory of the

scientist. Therefore our support to individual investigators starts with support of that character. In addition we provide significant assistance with equipment.

But as a matter of policy we do not provide operating grants. We believe — and it's a matter of very great importance to us — that if we're successful in attracting to Alberta and continuing to finance first-class investigators, they will be successful in obtaining further funds from national granting agencies such as the Medical Research Council of Canada, the Canadian Red Cross, the National Cancer Institute, or indeed from the United States. We have investigators in Alberta who get significant moneys from the United States. We believe that if we follow that course, our people, who hopefully are of a high level of excellence, will be successful in attracting operating grants from outside the province.

That is a rather lengthy answer to your question, but it touched on an important matter. I felt I should elaborate that we do not pay the operating costs on programs after the initial start-up, which, as I've said, is encompassed through the provision of an establishment grant.

MR. HYLAND: My second question — and I think you touched partly on it. When we had Farming for the Future, the Minister of Agriculture, before the committee, there was concern expressed by me and others — a concern I've had for quite a while, at least in agricultural research — that the more money the provincial government seems to put in it, the more the federal government seems to back out of it and our net gain is just the status quo. Is this happening? Are we in the medical research field remaining at the status quo, or has this program actually produced, in your opinion, a net gain of abilities, research, papers, and the things that can be done? You gave one example of actual clinical work.

MR. GEDDES: Again you have raised a question of very great seriousness and one which we have had under surveillance right from the start. That is the risk, of course; that people regard Alberta as being a very rich province, which can take care of its own. If provinces that are less blessed than ours are not able to provide funding, the possibility is that national granting agencies will show some bias against Alberta scientists. We've been concerned about that. We've not felt that was the case; rather to the contrary. We have felt that because we've been able to attract gifted and successful and productive scientists to our province and fund them in the ways I've just described, they ought to be more competitive than hitherto and hence should be able to get increased funding rather than decreased funding from national agencies.

Having said that, just within recent days an officer of the Medical Research Council of Canada was quoted in the press to the effect that researchers at the University of Alberta were going to get approximately $1 million less from the Medical Research Council of Canada in the current year than in the previous year. The order of magnitude was that it would be down from approximately $5.9 million to $4.8 million, a decrease that would concern us slightly. The officer who made this comment in the press was not able to comment on why that occurred, whether it represents any part of a trend. But I can assure you that we're going to review that situation and ensure that explanations, at least to our satisfaction, are obtained. But in the longer term, I would think that rather than seeing any decrease in relative moneys coming to Alberta from national granting organizations, we should see increases, in absolute terms and relatively.

DR. McLEOD: Mr. Chairman, I wonder if I could add one comment to that. This of course is the reason we are very apprehensive about getting into the operating grant program. I just want to emphasize that we've taken a deliberate policy and are monitoring it very carefully. We are prepared to change, given sufficient evidence, but we do believe it's an important policy.

MR. COOK: Mr. Chairman, this is probably the most exciting report we've had before this committee, and I want to congratulate the gentlemen here and their colleagues in the gallery for an outstanding piece of work. I think there's a basic attitudinal change taking place in the province. We're starting to appreciate ourselves as a little more of a maturing society, where we're actually making a contribution to the upward march of humanity instead of simply drawing on the expertise of people from outside our community. That's tremendous. I think your work has to be complimented, and not just in medicine. Having been through a couple of our universities, I think the attitudinal changes in the chemistry and physics departments and in computing science all bear some relevance to the work you're doing. I just want to say that parenthetically.

I have three questions. The first deals with the funding of innovations leading to the development stage. The white paper suggests that there is a gap in the funding between the work done in a research lab and then taking that bright idea and developing it to a prototype stage where someone like Vencap can pick it up and run with it. How do we in this province bridge that gap in your area of medical research? I understand from the former Dean of Engineering at the University of Alberta that your activities have developed new products, new equipment needed for calibrating very fine amounts of materials. How do we take that support equipment or that bright idea in medical research and fund it?

MR. GEDDES: Let me try to answer that question; it is one of very current import. The release of the government's white paper on science and technology has created a sense of urgency on our part as a foundation to respond to a range of questions that has preoccupied us throughout the summer of 1984. We have in fact had three successive meetings of our foundation at which these very issues of technology transfer have been addressed, and we're trying to grapple with what to us is a very serious issue and one that does not suggest glib or quick answers. We have to play our role in coming forward with well-reasoned and sensible responses to the difficulties that are present.

We do understand very clearly that innovation needs help in this province. We recognize that there is a need for innovation support. We have identified, and the white paper does a very good job in identifying, what those needs are. In the case of

medical science, the needs might range anywhere from very early stage support to an investigator, in terms of providing additional funding to carry on work that has some glimmering of potential outcome attached to it, all the way through to work that's involved in perhaps assessing the market for goods and products. So we understand very clearly what the range of support is. We also understand that the innovation process lies at the heart of this, and we have to examine the innovation process. To us the innovation process involves all those steps that lie between conceptualization and commercialization.

In terms of the recommendations in the white paper, we met as recently as yesterday with the president of the Alberta Research Council to further examine the thinking, as he has been able to describe it to us, of the members of his board and the early deliberations that have taken place within the ARC about innovation centres. We have some observations to make about that and will be reporting those observations within a very short period of time as part of the process of public input that takes place in connection with the white paper.

However, as an interim step we believe that we should do the following, and are taking steps to do so. Our foundation has agreed in principle to provide for one or two, probably two, further individuals who will serve our foundation under contract and whose mandate will be to go to the two universities and examine from all the health sciences faculties as well as from other faculties which are carrying out research work that will have some impact on medical care — that might include the Faculty of Engineering, for example; certainly it includes the faculties of dentistry and pharmacy and so forth, but it will certainly include all the basic science departments and all the health care faculties. That examination will be carried out to assess the state of market readiness of any discoveries, whether they're funded by our foundation or by outside agencies. We're going to try to make a deliberate and careful assessment of the state of affairs in this province. In our judgment, that assessment and work is best done on the campuses of the universities, and hence it will be done in close collaboration and close conjunction with officials at the universities. I'm encouraged to be able to report that both universities have made significant contributions to this whole technology transfer process by putting into place on both campuses people who are directly concerned with technology transfer. After having done that examination of the state of affairs, we're going to be in a better position to specify precisely what kind of innovation help will be needed, based upon the state of affairs as we find it.

As to funding, that will also be a function of the need as it will emerge. It's quite within the realm of possibility that further work on the development of pharmaceuticals might be identified. There may be medical devices at some stage of development. There might be computer software programs that require further work done on them. We simply don't know yet. We have some general assessment of it.

Having done all of that, we have formed a tentative opinion that it is likely that the process of medical innovation will require some separate attention. We have some concern that if there be one — or perhaps two, located in the major centres of Alberta — omnibus innovation centre, the particular problems and needs of medical innovation might be overlooked in that scenario. We hope there would be a particular focus given to innovation in the medical field. Furthermore, we hope our foundation would have a significant role to play and that that role would at least include the provision, through the means available to us through our various evaluative panels and advisory bodies, of some assessment of the technical merits of a proposal, the additional funding required, the way in which funding will be provided, and the way in which innovators will interact with the wider community, the venture capital community, the business community generally. The ways in which that will all come into being will depend upon the form and the shape that is given to the sorts of bodies that will emerge under the umbrella of the technology authority which is contemplated by the white paper.

Dr. McLeod, do you have any further comments?

DR. McLEOD: I don't.

MR. COOK: Mr. Chairman, if I could ask a second question. It seems that you're doing a review of the market readiness of some of the research activities. Is it possible also to do a review of some of the building blocks, if you like, at universities to give us the ability to conduct some basic research? I'm concerned that there may be some departments at some universities that aren't up to scratch. If we're contemplating world-class research activity — for example, if the genetics department of the university needs beefing up, that becomes a limiting factor in our ability to make some major breakthroughs. Perhaps either of you gentlemen could tell me how we go about assessing the relative strengths of the departments and then magnetizing the universities and those departments so we can conduct forefront research in all the exciting areas.

DR. McLEOD: That's a difficult question. I happen to have great faith in the entrepreneurial attitudes of what one might call energetic academics. I think it has been fascinating to watch the response to the existence of the foundation with the funds that have been available to it. Your point is well made. There are areas of the universities that have exploited this opportunity at almost unbelievable rates, and there are other areas that have lagged behind. But I think universities are communities of scholars, and it is not possible for areas to remain behind and to fail to exploit opportunities that are in front of them for more than a limited time before the institutional mechanisms that are in place in universities begin to bring pressure to bear. There is clear evidence now — as they say, unequivocal evidence — that that in fact has taken place.

When one looks at a specific area — and I could also list a number. One which has troubled me for a long time is so-called epidemiology and biostatistics. That's generally research into health care delivery, the place of modern technology in patient care, what's good and what's not so good, and so on. That kind of research takes place. That seems to be slow to get off the ground. But when I look at that particular example, there are bases for it. Number one, the manpower, or personpower, pool is not very large in that discipline, so we're setting out to try to create the climate that would allow young

people to decide to take that position. So I think there is a mechanism in place and that it is having its effect and will have its effect.

When I mentioned manpower and personpower, I probably should have indicated earlier for the benefit of the committee that our scholars and heritage scientists are not all men; there is a very significant number of excellent ladies who have been attracted to the province, just for the record.

MR. COOK: Mr. Chairman, can I get my third question in? I have been arguing that we should be using your model, your foundation, for the construction of other foundations in areas like genetic research, biotechnology engineering, pure sciences. Are there some limitations? You've had a chance to work with the foundation for a number of years now. Are there some changes in the basic structure of the organization that you would suggest to us, so we might profit from your experience if we do contemplate the creation of other foundations in other areas of activity?

MR. GEDDES: I don't think so. I know I gave that some thought at the time there were proposals. I'm not certain whether they emanated entirely from the University of Alberta or from the Alberta university community, but I saw proposals that came forward or that were circulating a couple of years ago for the establishment of two foundations, one for engineering and one for — the purpose of the other one escapes me just at the moment.

MR. COOK: Social sciences.

MR. GEDDES: The social sciences generally; I think that's correct. I did have discussions with a number of people at that time, and I read their proposals. I concluded that they were modelling their proposals very much after our own foundation. I felt they were good models, and I felt there was nothing in the way in which our foundation was brought into being or the way we've operated that I would want to change in any significant way. So the issue was considered, at least by me. I think the authors of the legislation and those who advised at that time had done their homework well. I think the foundation was well put together, and there are no inherent limiting factors that I would want to refer to.

Did you have more information?

DR. McLEOD: No, I was going to agree. I was only going to make one additional comment; that is, when a group of us attacked this question of how one might best address the support of medical research, we recognized at the time that medical research has its own particular configurations in the country, relationships to outside agencies, interactions within the scientific community, and that some of those might not necessarily best fit another discipline, another system. But I believe that what I have watched unfold has probably been one of the most interesting things I've ever participated in in my life. So I feel very strongly that it shouldn't be mucked up, if you accept that expression.

MR. MARTIN: Mr. Chairman, just to follow up in a very complicated area. I commend people in, I think, an excellent concept and excellent work being done. Medical research of course is going on in other parts of Canada and all over the world. I understand that part of what you look at in terms of what you're getting in research is, as you mentioned, the people and their qualifications. Your advisory board is international, which I think is important.

I'm sort of curious as to how you would decide what you're going to research. In saying that, I guess I'm worried about maximizing the bang for the buck. If there are other types of research in other parts of the world, what liaison do we have so we're not doing something that they're doing, that ours is in fact unique and contributing to the overall exchange of information?

DR. McLEOD: That's a very reasonable question, and one that plagues the scientific community also, because when dollars begin to become a little on the short side, concern for efficiency and effectiveness becomes paramount. As I hope you know, the availability of medical research funds on a national and international basis has not kept up with the growth of young people, especially now, who are interested in careers of this sort.

There is an inherent built-in mechanism in the decision-making process, especially for the operating grant programs, that just denies unwarranted duplication. A level of duplication must be accepted, because that really becomes a part of the scientific process. But unwarranted duplication is almost denied right now by reason of the fact that money is hard to get at the operating grant level. So while it's possible — I hope it's not too possible — for instance that we might put in place in Alberta a nucleus of people who, despite the best consideration one can give to the applications, turn out, let's say, to fall into the unwarranted duplication areas, that fact becomes evident very quickly. There are so many reasons we don't have operating grants that it could almost be the subject of a one-hour lecture. It's another one of them; that is, if we insist upon the operating grants coming from outside, not only do we get the assurance of quality, et cetera, which has been referred to earlier but we also have an acid test, if you think about it, for unwarranted duplication. If there were abundant sources of moneys out there for operating grants, a surfeit as occurred in the '60s in the United States, then that system would not operate effectively. But it really does operate very effectively right now. So that's one part of the answer.

The other one of course is the fact that we have insisted that there be conference grants, that there be visitors, that the scientist we support must have presented his work in national and international forums. He's going to find renewability very difficult unless he's been very productive in that context. Again, there is a more informal but nevertheless very effective mechanism of tracking down that which is unnecessary. I wouldn't want to argue that it's 100 percent, because it's not. But it has been tightened up so well in the last five years that I'm prepared to argue that it's now a very sound mechanism.

MR. MARTIN: Just to follow up, Mr. Chairman. Obviously access to information would be important on an international level. Is it your opinion that this access to information is not 100 percent perfect, as you put it, but that there is good co-operation so that

you know what's happening in Austria or whatever and can make a logical decision about what would be best done here within the foundation?

DR. McLEOD: Mr. Martin, there must be something special about Austria; it was mentioned earlier today. I apologize. I believe it's effective. There are some very grave concerns in the communication industry today with respect to the best ways in which the amount of science, the amount of information, can be pumped through to the most sensitive and important party at the other end of the system. Libraries are having their difficulty with the numbers of journals, the costs of journals, and so on. It's an horrendous problem. At the same time, there are new techniques of an electronic nature that are coming about. The scientific community is becoming more and more dependent upon sitting at a module in Calgary or Edmonton, punching in some numbers, and acquiring from the National Library of Medicine in Washington, D.C., an appraisal of the work that's going on in this particular area.

At the moment I suppose the best guess is that among the visits, the insistence on publication, the insistence on presentation of material, and a base library of some sort, which is a very difficult judgment to make, the opportunity to exploit the newer technologies and information systems probably represents an important long-term consideration for both the foundation and other agencies concerned for research and education in general.

MR. MARTIN: Just a final supplementary in this area, Mr. Chairman. I appreciate that a lot of effort goes into that communication. Is there willingness throughout the world, though? We often hear: this is my bailiwick, and we're going to do our thing. I'm wondering if the co-operation in medical research is generally good throughout the world, where we're not into our own little thing. Obviously everybody's going to benefit from what happens here or in another part of the world.

DR. McLEOD: It has long been a cherished principle of science that there be free and open communication. As we all know, in recent times there have been a number of ruffles of political intervention in some sensitive areas. There has also been some concern by the movement of scientists towards technology transfer and commercialization because of the obvious value of a new idea or a new bit of information. I think it's very encouraging that the scientific community in the major centres is setting a precedent and setting policy that limits the duration of time which is allowable under those circumstances. In our way there are two systems in place that would tend to discourage excessive treatment of that sort. One of course is the sure matter of the university appraisal of the individual faculty member, which brings a fair amount of pressure to bear upon the individual scientist, which encourages co-operation and collaboration. The second one of course is the position taken by the foundation on this business of renewability.

At the moment I don't know of any areas, other than some remarkable examples that I suspect you know from the press in the United States, where there have been some difficulties of this sort. Oddly enough, the communication between two small groups of scientists in North America in special interest areas is so tight that the individuals working in other centres practically always know what it is that's being held under wraps. I find it fascinating that even though the scientist feels protected, the other competing groups always seem to have access to the information. So I guess the system works even under those extreme circumstances.

MR. GOGO: Mr. Chairman, in his opening comments Mr. Geddes mentioned the objectives of the foundation being, if I could quote him:

> activities [that] are directed toward the discovery of new knowledge and the application of that new knowledge to improve health care of Albertans and all people.

I'm somewhat torn between the role of the foundation in attracting to Alberta scientists, particularly young scientists, who want to do their own thing in pure medical research and, on the other hand, in the application of not only that research but previous research.

Mr. Geddes also mentioned the difficulties of forecasting, and I can assure Mr. Geddes that he's not alone. There are people who forecasted things in Vancouver Quadra who have probably learned the lesson that he who lives by the crystal ball soon learns to eat ground glass.

My questions, Chairman, are more along the latter line, with regard to applied use of what's already known or recently been discovered. For example, Dr. McLeod, you were here a year ago. You stated at that time that you believed strongly in preventative medicine, that you — I believe I could quote you accurately — felt nutrition was a very important part of any type of research. At that time, to your knowledge there was a project in Calgary, a project in Edmonton, and four more in the mill that you hoped would reach fruition last fall. My first question would be, were those proposals for studies on nutrition approved and are they now being carried on? By the way, in responding to this you might want to indicate to the committee how the life expectancy of North Americans has changed in the past 25 years.

DR. McLEOD: Mr. Gogo, you have a long memory or a bad habit. Yes, a major proposal was submitted to us by the University of Alberta Faculty of Home Economics, approved, and in fact was probably the largest single grant we've made. I find it exceedingly encouraging, because it's based in the Faculty of Home Economics and linked to appropriate people within the Faculty of Medicine. It is kind of delightful that the senior scientist appointed to that position is the son of a distinguished emeritus professor of agriculture at the University of Alberta. He was a key player in the institute of hygiene at the University of Toronto and has moved here with the bulk of his own personal team.

More recently, and again I think it demonstrates the breadth of interest of the foundation, we have approved — and I hope it will be implemented; the approval is gone and is in the mail — a very distinguished, meritorious young scientist to join the department of food sciences in the Faculty of Agriculture. For the first time in my recollection, certainly in Alberta if not in Canada, we've created a package of research that runs from the medical

school and the division of gastroenterology, which is in the Walter C. Mackenzie Health Sciences Centre, to the Faculty of Home Economics, with a major investment and links to some people who I understand — I'm not an expert in that area — are real frontier people in food and food sciences in the Faculty of Agriculture.

So the answer to your question is a resounding yes; it's worked very well.

MR. GEDDES: Could I just interject very briefly? We were very interested at our foundation meeting just yesterday to learn of the progress of Dr. Clandinin, who is of course described as one of world's leading researchers in the field of nutritional medicine. As a matter of interest, Mr. Gogo, the news report that was provided to us came from The Lethbridge Herald of June 28, 1984, a very detailed coverage of that particular matter by Mr. Boxall of Lethbridge.

MR. GOGO: Thank you, Mr. Chairman. Lethbridge is Alberta's largest city after Calgary and Edmonton. Mr. Geddes, you made reference to the two universities. I assume you meant the two universities with medical schools, because we do indeed have a university.

In the interest of time, Dr. McLeod, I want to ask another question I believe is important to many, many people. I was pleased to see the Canadian Medical Association in their discussions just two weeks ago take action on something I think is very important to many people suffering from cancer; that is, the recommendation that heroin be used in Canada. My question is on pain control, if you could. I could certainly tolerate a written response in the interest of time, Dr. McLeod. What is being done with regard to pain control? It has to be one of the most devastating things people face. Conceding the fact that the human body, the greatest self-healing device in the world, is probably untouched by anybody's hand, we continue to meddle. We meddle and we end up with a great degree of pain. What, if anything, have we done in terms of research into pain control for Albertans and indeed all people?

DR. McLEOD: Mr. Gogo, I could try to answer that question with my foundation hat on and my nonfoundation hat on, because there is obviously a limit to the scope of the foundation's involvement in the total health care delivery system. There are individuals within the neuroscience group who are concerned with pain transmission, pain perception by the brain, and what sorts of factors cause some people or even one person to respond to a painful stimulus differently at different times. So there is some research in that area. It is only part of a larger program. I am trying to quickly run through my own mind the people we have funded. I believe that to be the only demonstrable example at this time.

In addition to that, however, there are people at the University of Calgary and the University of Alberta who have been attempting to establish multidisciplinary approaches to pain control that have arisen in other centres and would seem to demonstrate an advantage to the acquisition of information and to trials on new drugs and so forth. I believe that's the best short answer I can give you.

MR. MUSGREAVE: Mr. Chairman, I want to ask Mr. Geddes a question. When you were discussing these new laboratories that are going to be built in Calgary and Edmonton, I wasn't clear. Are they going to be built on the campuses of the two universities, or are they going to be built adjacent to major hospitals in the two centres? Who is going to pay the ongoing operating costs of these facilities?

MR. GEDDES: Looking at the location, the facility in Calgary will be built adjacent to the Foothills, adjacent to the medical school at the University of Calgary; and in Edmonton, very likely in close proximity to the Walter C. Mackenzie hospital. That has to do with the siting of them. We believe the operating costs of the hospital would be covered by the Department of Advanced Education.

MR. MUSGREAVE: So that's not a drain on the funds of the foundation; you're just providing the capital cost of the building. Is that correct?

MR. GEDDES: Yes, sir, that's right.

MR. MUSGREAVE: Do you anticipate as your program moves into the future that you will be required to build more facilities of this nature?

MR. GEDDES: No, we believe the involvement in the two clinical research buildings was a very significant exception to our normal method of operation. We do not believe it is likely that we will provide similar space in the future.

MR. MUSGREAVE: The next question I have, Mr. Chairman. Some members of the Faculty of Engineering in Calgary — and obviously they have a bias — suggested that your programs in areas of research are running into some difficulty with the lack of people in the hard sciences being available to supplement the various discoveries and techniques in the research work you are doing, and that as your programs develop more, you're going to need more support from this side of the university community. I don't know whether or not this is just another attempt to found the technology foundation, which I support. Dr. McLeod, I wonder if you would like to comment on that.

DR. McLEOD: I'm not sure I can explicitly, Mr. Musgreave. I am aware of a number of areas where people in the medical faculty have enlisted the collaboration and co-operation of members of the Faculty of Engineering in projects that aren't necessarily related to commercialization opportunity at all. As a matter of fact, they're just good solid research projects. The one that comes to mind deals with joint disease and the destruction of cartilage within knee joints.

My understanding was that this was a workable situation and that there could be participation, based upon the fact that the engineering faculty members of course also have a research component to their responsibilities and that matters could be worked out. So I am unaware of any particular problem area of that sort. That does not mean it does not exist; it just means I'm unaware of it.

MR. MUSGREAVE: Mr. Chairman, this deals with

that very difficult area of innovation and putting things in the marketplace and all the rest of it. Dr. McLeod, I imagine you'd be familiar with this. You appreciate that Dean Ritter in Calgary had an invention that he put a lot of money, struggle, work, and all the rest of it into, yet it collapsed. I have been led to believe that one of the major reasons for the collapse was that there was not a good marketing plan in place. The business side of the venture was not carefully structured. In spite of Dean Ritter's work and all the rest of it, this good idea just didn't make it. I wonder if you'd like to comment on that. When Mr. Geddes was talking about innovation, I noted that he didn't mention the business plan, and with his background I'm sure that would be number one on his agenda.

DR. McLEOD: Mr. Musgreave, I don't believe I can respond to the specific issue, other than the recollection that I knew Dr. Ritter personally, knew of his invention, and some of my colleagues were the clinical partners in testing the system. What happened after that, I fear I don't know about. On the basis of my current responsibilities, as has been mentioned by Mr. Geddes, I do know that this business about where the scientist goes and what range of help he needs is certainly a very important component. I'm sure Mr. Geddes could comment, as you suggested, much better than I.

MR. GEDDES: Of course I can't comment on the specifics of the matter you raised. In terms of the importance of such things as business plans, marketing studies, and so forth, perhaps I fall into the trap of assuming that those kinds of problems are relatively easily solved, that there's no difficulty, that there are lots of expert sources one could go to. In ranking the difficulties, perhaps the most difficult matter to bring about is arranging the marriage between the venture capitalists and the innovator. That's still going to be a very difficult problem for us. Although we do have a very big player in the international venture capital field in Vencap, we don't have the many pools of venture capital money and the many pools of venture capitalists who have shown any indication.

Moreover we don't have the large industrial concerns who are willing to take a flier on a young innovator. This happens in the United States. There are many areas of the United States where there are immense concentrations of companies. For example, in the Albany-Schenectady area of the United States there are a great many companies involved in electronics; they're large, prosperous companies. There are universities in that general area. Individual investigators can profit by industrial collaborations with them, and that experience can be repeated over and over again in many parts of the United States. We simply don't have that in Canada, and that's a very big inhibiting factor in bringing these matters to fruition without the involvement of government, which is an important qualification.

MR. MUSGREAVE: One last comment, Mr. Chairman. I know Dr. McLeod was going to raise the point about women because he knew I was going to raise it. I note in your report that there are several women doing various studies, but it's interesting that in the whole report there are only two women and several men in pictures.

DR. McLEOD: That's quite true, Mr. Musgreave. Actually I didn't know you were going to raise it, but I might have suspected from the research advisory committee. That's true; there were two at that time. The number has increased since. There is a scholar in microbiology in Edmonton, one in genetics, one in infectious disease, one in pediatrics. In Calgary there are two in oncology — woops, I seem to be running out. In any event the number is growing, and I'm gratified by the fact that the applications . . . More recently Dr. Catherine Lord was appointed at the Glenrose hospital in a joint arrangement with the University of Alberta department of pediatrics. So it's growing and growing well, thank you.

MR. CHAIRMAN: We've passed the normal time at which we adjourn, but there are still a couple of members who have some additional questions they'd like to raise. Would it be okay with the committee to extend it for a few more minutes? Mrs. Cripps then, followed by Mr. Cook.

MRS. CRIPPS: Thank you, Mr. Chairman. Given that you talked about the transfer of new technology and developments to medical practitioners and that that improves the health care of the province's constituents, I asked a question of Dave Russell which he transferred to you; that is, what balance is there between applied research and pure research in the province of Alberta? Does the development of the clinical sciences building and the new clinical sciences research team that you talked about earlier resolve that problem? You alluded to animal research. Is that only animal research, or do you expect it to be applied research?

DR. McLEOD: As I've said, we really confront an international problem in trying to enhance clinical, patient-based research. Part of it has been the pressure on the young physician to enter the practice of medicine, that for which he or she was trained. We are now putting programs in place which we think will address two major problems. One, we will provide not equal but very competitive funding for the clinician who is prepared to take on a research career. That's done with some discomfort, because there's a disadvantage to the nonclinician in that setting. But we are prepared and are doing that. Most recently we've appointed a plastic surgeon who will address problems of burn and skin management in various disease states. So that's one point.

The second point is that we have fashioned a program which, instead of insisting that the clinician take years of additional training beyond that which is required to become a competent specialist, will appoint that person to a faculty position with the university's co-operation, but only under the circumstances that he or she work in a setting that is supported by other experienced, competitive scientists. The reason is that most young people in the past — and many of us from the '50s were among them — took our clinical training, became hopefully competent clinicians and teachers, and then took a little bit of research training. By that time we were 29 or 30 years of age, and the medical schools would appoint us to positions. All those people intended to continue a research career, but the amount of

research training and the experience they had were so limited, and the pressures to do other things so great, that almost inevitably they lost competitively when they sought operating grant funding over time.

We believe we have a key. We think we have a good program. It's probably one of the more exciting things going on right now, putting these young people in that specially protected surrounding, hoping that will allow them the additional experience from the assistance of the more experienced about them to cause them to retain a long-term career. We and everyone else are going to be watching that program like hawks.

The second response to your question is yes. By insisting that the new clinical research facilities be multidisciplinary, by insisting that they be closely related to the patient care facilities, and by insisting that the research people who go into them, if they're not clinicians, are supportive of clinical research, we think we can make a major contribution.

MRS. CRIPPS: Thank you.

MR. COOK: Mr. Chairman, I was interested in a remark, I think by Dr. McLeod, that the researchers were hired for five-year contracts and that after the fourth year the individual was evaluated and there was a decision to either terminate the contract or carry the person on for another five years. The reason I'm interested in this — I'd like to contrast that with the concept of tenure at our universities. How difficult is it to attract outstanding individuals with five-year contracts which may or may not be renewed? The reason I ask the question is that I'm told by academicians that it's not possible to attract outstanding individuals to a cold, frigid, remote area of the world, away from all the pleasures and intellectual stimulation offered in major centres, without offering tenure. Is that true?

DR. McLEOD: Are they beginning a new medical school in Inuit or Aklavik or something? [laughter] I hadn't heard about it.

It's a plus/minus situation. There are several factors. Number one, and let's be quite frank about it, there aren't very many other opportunities about the world today. So if you have an opportunity, especially a well funded, well started-up opportunity, almost ensuring you of a competitive capability in the future, the risk to that bright young person is really not very great. Young people are very smart and recognize quickly, I think usually 90 percent of the time, whether or not they're at risk. So number one, in the younger groups that has not been a problem.

With the more experienced scientist, it kind of falls into a number of different categories. There are some who have years of experience and success, and shrug their shoulders and don't really worry about whether or not they have a tenured position. There are others who have. It's been our good fortune that the universities have been able to look at those individuals, look at their academic records, and say to themselves: good heavens, this person is going to be successful with the foundation; we have an attrition pattern within the university; we can take at risk this particular application and put it on a tenure track arrangement. So thanks to the co-operation of the universities and their willingness to look at this in the very cold light of dawn, it has worked very well. It might not have worked under other circumstances in other times.

MR. COOK: Thank you.

MR. CHAIRMAN: Gentlemen, I have a series of questions, but because of the time I'm going to negate them today, except for one. Then I'm going to follow up with Dr. McLeod with respect to some specifics on the question of multiple sclerosis research in the province of Alberta, particularly at the University of Alberta.

We've now spent two hours and 10 minutes talking about this whole basic question of medical research in the province of Alberta. We've talked about the international connection, the national connection, and the provincial connection. There are 2.3 million people who in essence are the citizens of the province of Alberta, yet a very, very small percentage of them may read a document like this, if they choose to find it in a library or one is conveyed to them by a Member of the Legislative Assembly or perhaps even by the foundation itself. What spokes do you have reaching out to the people of Alberta — i.e., the various chambers of commerce, the laypeople of this province — to discuss this whole question of medical research and the very important role it plays in our province today? The odd press release that can go out, the odd bit of press that might be available to cover it, is one thing, but I think the vast number of the citizens of Alberta are quite ignorant of what we're doing in this very, very exciting field. Do you have a program for the foundation to reach out?

MR. GEDDES: Yes, sir, we do. I can tell you we deal with that matter at each regular meeting of the trustees. Through the use of our own public relations officer, who's a part-time employee of our foundation, we endeavour to make sure that we reach, for example, weekly newspapers in the smaller communities in particular. We believe we have considerable success at that. We monitor that on a very regular basis. It's a difficult matter — and I think anyone associated with the university can tell you that — to make sure the public is continually aware of the excellent work being done at our universities. That's where most of our work is being done. So in some sense this is a part of a general problem facing universities — to make sure that work of excellence, and the significance and importance of it to the lives of ordinary people, is being understood.

It is a difficult job to provide information that's deemed by the media to be newsworthy. Regrettably the media sometimes react to blockbuster announcements and matters of that kind. But we are appreciative of the need to involve people at every level of Alberta society. We try to do that. We have other forums. We have a newsletter, in this form, that admittedly goes to a rather informed public, but that's one medium we use. As I've said, we take care to make information available to the press throughout Alberta, not just the press in the larger centres. And we hope that the science fairs at which awards are given to young Albertans reach into high schools and become known to parents. There may be other examples.

DR. McLEOD: Those are good examples.

MR. GEDDES: Certainly, Mr. Kowalski, if there are ways in which either members of this committee or members of the Legislature generally feel that we can improve our position in transmitting this knowledge, we would be very grateful for any observations you might wish to give. We consider it a very important question. We think we operate not in a vacuum but in a way that is of enormous importance to the people of Alberta, and our work should be well understood and communicated.

MR. CHAIRMAN: Mr. Geddes and Dr. McLeod, on behalf of all members of the committee, I think I'm very safe in saying that this morning was one of the most interesting discussions we've had with respect to any aspect or portfolio funded under the Alberta Heritage Savings Trust Fund. I want to thank both of you gentlemen very, very much for the co-operation, one, in setting up the meeting and, secondly, in the frank manner in which you responded to the questions from committee members this morning.

Mr. Geddes, I think you indicated a little earlier that perhaps the next opportunity you might have to meet with this committee would be three years hence, when you have your second triennial report. It may very well be that because of the interest of this morning's meeting you may expect an invitation to meet with us again, perhaps on an annual basis. If such is the case, I'll be contacting you in the spring of 1985 for a scheduled appearance in the early fall of 1985.

MR. GEDDES: Very well, sir.

MR. CHAIRMAN: Thank you very much. [applause]

Committee members, next week we'll reconvene on Monday, September 10, with the Hon. Al Adair. We have a meeting on Tuesday, September 11, with the Hon. John Zaozirny, and Wednesday, September 12, with the Hon. Don Sparrow, Associate Minister of Public Lands and Wildlife. We'll also look at the first cut of our consideration of recommendations.

There's some documentation here that I provided with respect to Syncrude on our meeting on next Tuesday. Those of you who are interested in administrative detail, kindly come up and take care of it. I know a number of you are anxious to get to the airport. Have a good weekend.

[The committee adjourned at 12:15 a.m.]

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