

VICTORIA LODGE OF EDUCATION AND RESEARCH  
650 Fisgard Street, Victoria, B.C. V8W 1R6  
1987 - 2

**THE SCOTTISH RITE CHARITABLE FOUNDATION AND ALZHEIMERS.**

by W.Bro. David C. Brown P.M. Britannia Lodge No. 73, B.C.R.

My Brethren. Up until this year, as far as I was concerned, the Scottish Rite Charitable Foundation was just another organization for raising money. Sure, they probably put it to good use, but, like many of us, I didn't give it too much importance - until last spring, when I came across a copy of a luncheon speech given by a prominent Toronto Doctor. How a copy of this talk came to my hands, or why, I do not know. But there it was and I read it. Half way through, I started to realize how ignorant I was about the tremendous work for humanity our Foundation is doing. I concluded that if I was in the dark, then many of my brothers would also be unaware of it. Obviously, I was receiving further "light", and what better way of passing along to my brethren this "lesson learned" than by spreading the word at a Lodge of Education and Research. Hence my reason for standing here to-night.

Before I read this speech to you, I confess to having eliminated some of the very technical parts in the interest of brevity. Also, it would be helpful for you to know why this doctor is qualified to speak with authority. So, I shall first read the delightfully worded introduction of him.

The introducer says -"Mr. President, Sovereign Grand Commander Bennett, honored Head Table Guests, my Brethren all. It is a pleasure for me, at this Scottish Rite Charitable Foundation Luncheon, to introduce to you our Guest Speaker Dr. Donald McLachlan. He is a graduate of the University of Toronto and is now a professor there in the Departments of Medicine and Physiology.

Since his graduation in 1957, he has increased his knowledge and expertise with Post Graduate Studies gaining the honour of Fellow of the Royal College of Physicians and Surgeons. His research is carried on at the Toronto General Hospital.

Dr. McLachlan is an exceedingly busy man, active researcher, teacher, administrator and medical consultant, on reading his "Curriculum Vitae" you would think that any one of these areas would keep him fully occupied, but no, he is able to integrate all of them and his presence here today indicates the importance he places on his association with the Scottish Rite Charitable Foundation. Dr. McLachlan has been actively productive in his research endeavors i.e. the area of Alzheimer's Disease.

During his professional career he has received many honours for research, among them the Star Medal for Basic Research in Physiological Studies. Dr. McLachlan is much recognized throughout Canada and the United States, as well as Europe - in Professional Institutes; on Educational Boards; on National and International Committees.

We of the Scottish Rite Charitable Foundation are very, very pleased that he is a proud recipient of one of our Research Grants. Our speaker is widely published in many scientific magazines, as an author of chapters in many medical textbooks, as an invited speaker and lecturer in his chosen field at national and international medical conferences and symposia.

He is an excellent communicator, sharing his wide knowledge in a language we as laymen can understand. How fortunate we are to have as our guest this noon hour Dr. Donald McLachlan, and I have the pleasure of presenting this learned Doctor to you."

And the Doctor speaks -"As you have heard, I am the proud recipient of a research grant from the Scottish Rite Charitable Foundation. As a scientist, I am particularly grateful to receive your financial help. However, there is an even more important reason why I am so pleased to receive your financial support. About 25 years ago, your organization made the decision to support research into mental retardation. You made that decision at a time when research into mental retardation was neither popular nor in the forefront of the public interest. Nevertheless, you have supported research in this unpopular area, and more recently, supported research into senile dementia. Clearly you have demonstrated foresight by sponsoring research into the most important area of human behavior; the machinery of the human mind. The brain, of course, is the substrate of the mind, and whenever brain damage occurs, alterations in personality and social adaptation occur. It is often very difficult to relate to people who have

6.

brain damage in the same way one relates to other types of illnesses, like heart disease and cancer. In those conditions, the personality and all the lovable qualities of the individual are preserved. But brain damage, all too frequently, results in a change in personality which alters one's ability to respect and love the affected individual. Brain damage such as it occurs in the mental retardations often result in placing the individual into institutions and forgetting that they exist. Your efforts have been to mobilize scientific help for those people, and I feel that this has been a most laudable undertaking.

By supporting research into both the mental retardations and senile dementia, you also recognize that these conditions represent a continuous spectrum of disorders. I fully agree with your position, and there is little question in my mind that research achievements in one area will greatly assist the other. Of course, in the last few years research into both mental retardation and senile dementia has become far more fashionable and socially acceptable. I therefore salute you as one of the leaders in heralding research into these less attractive areas of human suffering.

I believe today that I am able to report several advances in the investigations of mental retardation and senile dementia. First, the public attitude has changed tremendously towards investigating these diseases, and with a shift in public attitude, more funds are becoming available to encourage scientists to seek a career in these areas. I feel that the scientific community is becoming ever more interested in addressing diseases of the mind and diseases of learning and memory. For this reason, I feel optimistic that the years ahead will represent years of rapid progress and growth of knowledge which will eventually improve the quality of life for those handicapped individuals who suffer from learning disabilities and senile dementia.

The second major area in which there has been rapid progress is in the understanding of Alzheimer's disease and related conditions which result in senile dementia. Rapid progress in the last 3 - 5 years has occurred in understanding some of the basic cellular mechanisms responsible for dementia. This has led to the investigation of a number of drugs which may be important in improving mental functions in Alzheimer's disease. In addition, there has been a very great improvement in patient care for victims of Alzheimer's

Greater awareness of the exact nature of the disease has led to more sympathetic and humane treatment for victims of Dementia. In addition to marked improvement in the attitudes of people looking after individuals with senile dementia, new care facilities specifically designed for the Alzheimer patient have been built. These special care units are rapidly increasing in number across the nation, and with them has come improved ability to handle patients with Alzheimer's, and to employ fewer physical and chemical restraints. In the new special care units, the use of major tranquilizer drugs has become reduced and therefore the quality of life of the victim improved. In summary, I am most gratified to report that the quality of care of victims of Alzheimer's across Canada is rapidly improving and I think we will find an even greater improvement in the years ahead.

New drug treatments are also being instituted across Canada. We have recently collaborated with a group of researchers at the Montreal Neurological Institute who have initiated a trial of infusing drugs directly into the brain with a special pump for the treatment of Alzheimer's disease. The rationale for this treatment arises because a group of neurons deep in the brain are selectively destroyed by Alzheimer's. Any of you who have had experience with a loved one with Alzheimer's disease know that there are fluctuations in brain function which indicate that the disorder is not completely irreversible and if we could find the appropriate chemical key to improving function, a great benefit to the patient and to the family would result. These studies in senile dementia also raised the possibility that learning disabilities of the mentally retarded, which we have always regarded as fixed and irreversible may be rendered less profound by the appropriate manipulation of the chemical environment of the brain.

Another treatment trial is under way in our research group and is based on the observation that aluminum is associated with the neurofibrillary tangles and senile plaques of Alzheimer's disease. It has been known for approximately 20 years that aluminum is highly toxic in the brain and that aluminum accumulates in Alzheimer's disease in concentrations which, if they occurred in laboratory animals such as a cat or rabbit, would destroy the animal in 2 to 4 weeks. We have developed means of removing aluminum from the brain and we are currently studying whether this treatment improves the quality of life for victims of Alzheimer's.

A third area of progress in Alzheimer's is the appearance of new research centres which are applying the most advanced molecular biology towards understanding the fundamental cause of Alzheimer's disease. One must remember that any of the treatments we have been talking about will only patch up an already damaged brain. Our real goal, both as lay individuals interested in Alzheimer's disease and as scientists, is to achieve sufficient understanding of Alzheimer's that we could prevent or cure the disease. Now, for the first time, I have begun to hear university deans and presidents talking about establishing Alzheimer's research centres. I have also begun to hear philanthropic groups ready to invest large amounts of money in building research facilities which would be effective in advancing our fundamental understanding of this dreaded condition. High calibre research centres are not only important in shortening the time required to discover the cause and prevention of Alzheimer's disease, but they also bring better patient care to the community in which they exist. Perhaps the most optimistic message that I can convey today is the fact that as a nation we are beginning to form truly effective research organizations which will focus on both Alzheimer's disease and the learning disabilities.

The Scottish Rite Charitable Foundation knows very well the true meaning of research. Unfortunately, the Canadian public at large has not realized the true meaning of research into mental disorders. I believe that the true meaning of research into these diseases is two-fold; Research is hope for the disabled and is a cost effective investment for the well. Have you ever stopped to consider what it costs the community to maintain one child who is born with severe mental retardation? One child born today with serious mental retardation will cost you - the Canadian taxpayer, between two and four million 1986 dollars over his or her lifetime. Never mind the suffering, never mind the waste of human energy, the cost will be four million tax dollars. The Canadian public does not realize that the prevention of mental retardation and senile dementia will save millions of dollars of tax money and will greatly improve the quality of life not only for the victims but for each and every individual in Canada. Therefore, an investment in medical research is probably the best investment that a society can make. Of course you of the Scottish Rite Charitable Foundation have recognized this many years ago.

And research is hope for the disabled. As the scientific community becomes more organized. and works towards a more effective treatment, each victim and their families hope that the solution will come to their problems before long. How long the period is before we can develop an effective treatment is very much dependent upon the human and financial resources that our communities are willing to apply to these diseases.

What did we really know about Alzheimer's disease in 1986? Three years before when I addressed the Scottish Rite Charitable foundation, one of the hypothesis about the cause of the disease was that of a slow virus. In the ensuing three years this hypothesis, which looked most promising, has been vigorously explored and appears less likely today. There has been magnificent work on the slow viruses and while this work will certainly be helpful for a rare form of senile dementia, called Jacob Creutzfeldt disease it is unlikely that Alzheimer's is directly related to a viral infection. Nevertheless, there are a number of investigators who are continuing to explore this possibility and some form of transmissible agent cannot be completely excluded at this time. In recent years, an increasing attention has been directed toward the genetic component of Alzheimer's disease. One idea is that a master gene has been damaged and this releases Alzheimer's disease. We think that is a combination of environmental factors plus genetic factors which release Alzheimer's disease in most people.

What is the evidence that some factor in the environment may play a role? Well, first of all, it has been recognized for several years that there are geographic regions of the world where diseases which resemble Alzheimer's are extremely frequent. There are four principal geographic regions of the world where the incidence of Alzheimer-like disorders is 50-100 times higher than the world average. The most

8

extensively studied geographic area in Guam where the incidence of Alzheimer-related disorders is probably 1000 times higher than the world average. Excellent epidemiologists have investigated this unique medical region and have concluded that the extremely high incidence cannot be related to inheritable disease, or to a transmissible factor. Each of the epidemiological teams have concluded that there must be a factor in the environment which is responsible for this inordinately high incidence of disease: The hallmark of Alzheimer's disease, the neurofibrillary tangle, is associated with extremely high concentrations of aluminum. Because the villages with high incidence of neurodegenerative disease are in regions of high bioavailable aluminum and low

calcium it has been postulated that the calcium deficiency, together with an exposure to aluminum may be a factor in the release of the disease. It is also known that the Chamorra peoples of Guam eat a fruit from a primitive palm known as cycad. The cycad appears to contain a toxic amino acid capable of selectively damaging nerve cells. Thus, there are two exciting new areas for investigation of environmental factors which could be important in the release of some of the brain damage associated with Alzheimer's. These geographic regions of the Pacific ocean become laboratories for attempting to understand precisely what factors release the disease. If we could identify these "dementens", we would be able to search in our own environments for similar toxic factors.

It is unlikely however, that environmental factors alone are the whole answer to the problem. Indeed, many investigators are concerned about the rule of genetic factors in triggering Alzheimer's disease. The Scottish Rite Charitable Foundation has for years supported research in Down's Syndrome. I am sure that you are all aware that Down's Syndrome results from a genetic anomaly in which the individual is born with an extra chromosome, chromosome 21, in every cell of their body. The extra genetic material of chromosome 21 leads to very serious mental retardation, but as Down's Syndrome individuals age, particularly beyond age 35, they have an increased incidence of Alzheimer's disease. We believe that there is genetic information on chromosome 21 which releases Alzheimer's disease. In a nutshell, we believe that some environmental factor, perhaps together with a genetic predisposition, results in damage in a region of chromosome 21 resulting in the release of Alzheimer's disease. Clearly, the fact that a mental retardation could be related, or at least an important clue to senile dementia of the Alzheimer type, speaks very well for the decision of the Scottish Rite to support research in both mental retardation and senile dementia. I believe that we must concentrate our efforts upon a rigorous evaluation of chromosome 21 and understand exactly how the extra genetic material of this chromosome causes both mental retardation and senile dementia.

I was very pleased last evening to learn that the Supreme Council of the Northern Masonic Jurisdiction of the United States are supporting research into schizophrenia, and the Supreme Council of the Southern Masonic Jurisdiction are supporting research into autism. It has always been my feeling that research into Alzheimer's and the mental retardations may offer insights into these two devastating diseases. I believe that the tools and techniques developed to study Alzheimer's should also be applied to schizophrenia and to other neurodegenerative diseases such as Lou Gerig's disease or amyotrophic lateral sclerosis. My point is that your support into research into the fundamental mechanisms of Alzheimer's may well have relevance to other brain disorders.

In conclusion, I would submit that the dementias and the mental retardations can be considered as a kind of obstacle or boulder in the pathway of human welfare. However, in the last few years we have learned a great deal about these disorders and have developed new tools which, in a sense, are beginning to rock the boulder. At first, people believed that Alzheimer's was an invariable consequence of aging. No one believes this today. Until very recently we believed that the intellectual performance of a brain-damaged individual was fixed. However, recent clinical trials are proving that this dogma is also false. These are major forward steps in human understanding, and I believe that the possibility of removing the boulder from the pathway of human welfare is realistic. With continued efforts, continued hard work of groups like yourselves, we may well look forward to a world without Alzheimer's disease and therefore a much improved quality of life for the elderly. My greatest respect to you for your hard work in this field.

Dr. D. McLachlan.

9.

So there you have it, brethren, an insight of what your S.R.C.F. is doing to aid suffering humanity. There are many, many good charitable organizations requesting your assistance, each claiming top priority, and rightly so. But I have a very positive feeling that if you deposit as many bucks as you can, and as often as you can, to the Scottish Rite Charitable Foundation, it will be thankfully received and faithfully applied.

David C. Brown

\*\*\*\*\*