

HERITAGE LECTURE

by

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What a wonderful moment in the history of our country to deliver this heritage address. It comes towards the end of a year in which Agriculture Canada has mounted a vigorous celebration of a century of accomplishment by the Research Branch of our federal department of agriculture. Much of the science heritage of our country is bound up in these 100th birthday celebrations.

Our research centennial commemorates much more than 100 years in the life of a section of the federal civil service. It marks the beginning of the application of formal science on a serious scale to Canada's agricultural industry. It marks the growth and development over the succeeding century of a hugely successful science community in government and outside devoted to the support of our food production system.

It is difficult to imagine that Canada could have emerged as a strong and politically united country without the companion development of a powerful food production system. But the food system did grow with the country and indeed helped make the country to a large degree. Behind that success story through the years were the efforts of thousands of research scientists.

As entomologists we can be proud of the fact that the founder of the Agriculture Canada research institution was one of us. William Saunders was an entomologist by avocation in the days when formal training was not available. We must recall that in the mid-19th century entomology in Canada was a hobby of naturalists attracted to insects.

There were no reference collections available to them to help identify insects, beneficial or destructive. Much information was exchanged by correspondence with people of like mind, often in other countries. Scholarly papers on insects were carried in naturalist journals. This then was the world where William Saunders and a few contemporaries like L'Abbé Léon Provencher, a Roman Catholic priest were already at work defining Canada's flora and fauna.

William Saunders was born in 1836 in Devon, England, the son of a shoemaker who was also a lay preacher in the Methodist Church. Saunders came to Canada with his family as a boy unaware he would one day launch a publicly-operated research organization that helped dictate the future of the country. That day came in 1886, 50 years after his birth, with the passage of the Experimental Farm Station Act by the federal Parliament.

All our lives are dictated to some degree or other by great men and women and William Saunders was indeed a great man by any definition. He became a pharmacist by apprenticing to a druggist in London, Ontario where the family had settled. He had his own drugstore at 19. He bought farmland and grew tree and small fruits. On his own, he began applying the scientific method in his own natural environment and he emerged as a competent scientist.

His interest in the pharmaceutical value of plants led him down the road to entomology. He spoke and wrote widely on the subject and his many forums included the Canadian Entomologist which he established.

It is clear that Saunders was one of those restless and constructive spirits who started things. Obviously, he also knew the value of organizations to get things accomplished. So, it was entirely in keeping that he and a lifelong friend, the Reverend Charles Bethune, started the Entomological Society of Canada in 1863.

Bethune, an ordained Anglican minister, was another of those talented amateurs who laid the groundwork in Canada for the growth and development of entomology into a professional discipline. It is not too far off the mark to say that Bethune and Saunders are two very human reasons why we are all here today.

It is said that Bethune was the first to suggest that parasites be imported into Canada for biological control. It was a prescient thing to suggest, bearing in mind the difficulty of pursuing the study of entomology at the time. Books were scarce and Bethune and Saunders wrote constantly to each other sharing information and ideas. Each summer the two friends got together for several days to compare notes, study and collect specimens.

It is on the basis of such personal commitment that great events are built. Whether he had a notion or not of the future, Saunders was preparing for what might be called his greatest task. That was the launching and early stewardship of the federal government's Experimental Farm System.

When the federal government became concerned about the state of agriculture in Canada, particularly about its development in the west, it turned to Saunders for advice. He studied the question of scientific support for agriculture and concurred with the idea of an experimental farm system along the lines of those developed in other countries.

The fact is Canada was well behind such European countries as England, France and Germany in applying formal science to agriculture. All these countries had a well-developed experimental farm system in place when Saunders was brought in for advice. In any event, the Canadian Parliament in 1886 made one of the most discerning and far-reaching decisions ever made by our national government. It decided to create those first five experimental farms across the country primarily to lift the farmer to higher levels of production efficiency.

That decision came when Canada was less than two decades old as an independent country, trying to find a national identity and a future with scarcely any past. Half the adult population lived on farms then compared with less than four per cent today.

That decision set the tone and path for agri-food research in the country for the succeeding century. That decision almost immediately made the federal government the dominant force in the application of science to food production. That situation obtains today.

Those first five experimental farms grew into Agriculture Canada's Research Branch, which took on its present name in 1959. We in this branch see ourselves as partners with the universities and all the other institutions in the research field dedicated to food production and processing and distribution. Our centennial celebration this year is as much theirs as ours. They are, like us, the keepers of the heritage tied so closely to the love of an English immigrant pharmacist for science and what it could do for his fellow humans.

I must say I have a strong sense of kinship with Saunders. I admire the doers of this world who also serve. He was both. In addition to everything else he did and was, he was a founder of the Ontario College of Pharmacy of which he was president for two years. He was a professor at Northwestern University in London. In addition to contributing articles to the Canadian Entomologist, he was also editor for a time.

I take a great deal of personal pride in the fact that for a time in our history as a nation I was able to lead the research organization that Saunders began. Including Saunders there have been fourteen men who have led the organization in different conformations. I am the fourteenth.

At this point, I have no idea who the 15th will be. But I hope that my successor will honour the traditions that have been established over the past century. Honourable tradition is the handmaiden of scientific achievement. The scientist who follows me in this post will have one hundred years of honourable tradition to help find new roads to accomplishment.

The remainders of our research heritage are all around us. One of the five original experimental farms is not far from here in this province, the Brandon Research Station. My office is in the Agriculture Canada headquarters building on the historic Central Experimental Farm in Ottawa. That of course is another of the five original farms at the beginning. On the central farm a short walk away from my office is the William Saunders Building, named after the man himself.

It sits on the site of the house he occupied for many years when he headed the early research organization. That elegant reminder of an earlier age was torn down in the early 30s, but the name of the occupant lives on in the present building. I might point out right here that I wasn't treated nearly as handsomely by the federal government as Saunders was. I had to build or buy any house I ever lived in.

My preoccupation with Saunders should not detract unduly from all the scientists who made the Research Branch of my department the organization it is today. Many of these of course were entomologists. I think of the English immigrant, James Fletcher, another one of those talented amateurs of the early days.

After he came to Canada, he was a bank clerk and library worker, but his real interest was entomology and botany which he studied in his spare time and he became the first chief of the entomology and botany division. Fletcher's personal insect collection became the donated foundation of the branch's national collection in Ottawa. Seventeen species of butterfly bear Fletcher's name.

Fletcher found a kindred spirit in Norman Criddle, whom he met in 1900 on a visit to Manitoba during a grasshopper outbreak. Criddle grew up on a Manitoba farm and many of you will know it was his efforts which were the foundation for much of the later grasshopper control work in Canada.

Criddle was another of those gifted amateurs of the early days of the application of science to food production. He was a self-taught naturalist and a skillful painter of trees, shrubs and flowers and was later brought into the experimental farm system as an entomologist.

The 20th century gradually brought professionally-trained entomologists into the science picture at Agriculture Canada and elsewhere. Through the years, entomology took its rightful place in the sun in the Agriculture Canada research arm in various organizational arrangements. There were many names important to entomology in Agriculture Canada.

I won't go into detail about them. There is something very special about those in at the very beginning like Fletcher. But later, various people like Arthur Gibson, Gordon Hewitt, Robert Glen, Beverley Smallman and many others played important leadership roles.

Agriculture Canada did many things this year to celebrate the research centennial. There were open houses at research stations. Some of you may have attended the big birthday party we held on the lawn outside the William Saunders Building on the Central Experimental Farm last June 2nd. That was a very special event indeed. For June 2nd was the precise day when the legislation to set up the experimental farm system became law 100 years before.

I hope all of you have received a copy of our centennial brochure, *In Search of Plenty*. We also went to considerable effort to prepare a history of the Research Branch. It was written by Tom Anstey, who spent most of his adult life in the Agriculture Canada Research Branch before retiring. His book, *One Hundred Harvests*, is available through bookstores which act as agents for the distribution of federal government publications. I commend it to you for it is in part the story of a nation as well as of science.

It tells the story of the Research Branch as only somebody can who was deeply involved with it for so many years. Naturally, entomology is dealt with in some detail. It is important to read and know about the people and events and conditions that preceded this meeting here today and in a real sense brought us here together.

One centennial aim was to remind all those with an interest in agri-food research to look at the past and prepare for the future. We have many tasks ahead in many fields. We must continue building our data base in the whole field of molecular biology. That area in particular is crucial to our agri-food economy dealing as it does with the creation and protection of new plants and the improved performance of livestock.

Clearly we must tackle more vigorously the problem of soil degradation in Canada. Loss of organic matter, salinity and erosion by wind and water remain particular problems. We need sharp leaps ahead in our research capacity to create new products and processes in the food processing field. Our new food research institute at Saint-Hyacinthe near Montreal will expand the excellent work of the Food Research Institute at Ottawa.

At the same time, we must effectively deal with the hundreds of other small and big problems that besiege the agri-food industry in Canada. One of the big ones is pesticide use and misuse. We must continue the historic task of moving the nation towards a more judicious, limited and intelligent use of these chemicals, yet maintain cost-effective production.

Cost-effective is a very important double word in our scientific vocabulary. As scientists we must continue to develop the technology to improve the economic position of the Canadian farmer. That too is part of our heritage, made all the more important now because of the price and market crisis afflicting some of our farm community.

Our kind of science can do many things on the economic front, now as in the past. Our entomologists and other scientists must continue to contribute the knowledge needed to deal with insects, weeds and plant disease more cheaply than the exclusively chemical route. Some day, courtesy of entomology and genetic manipulation, we will have commercial crops that produce their own insecticides. That will be much cheaper than spraying. I assure you. Some day I trust we will have a range of commercial crops capable of obtaining their nitrogen requirements from the air rather than from the fertilizer store.

We can accomplish these things and many more because we have the tradition and experience behind us to make it happen. But future success will also depend on the continued support and understanding of our patrons of research into food production. That interest is also part of our national heritage, something to be treasured and nurtured.

Our heritage is many things. One of those things is what the social historian, James Gray, in his book, *Men Against the Desert*, called one of the greatest Canadian success stories of all times. He refers to the massive campaign that, in his view, prevented the reduction of much of the southern Prairies to a virtually uninhabitable desert in the 30's.

The fight to save the Palliser Triangle from drought, dust storms, grasshoppers, sawflies, hail and rust was led in large part by our experimental farms. Gray is almost overwhelming in his praise of the work of our scientists. It was them, he said, who provided so much of the hands-on knowledge, physical help and leadership that brought the Palliser Triangle back from the brink of destruction. Without the experimental farms, he says, nothing would have been possible.

Gray singled out the entomologists for their contribution. Let me quote: "Nor was the advice of any of the scientists sought after more frequently than that of the entomologists".

With great eloquence, Gray argues that the return of the rains to the Palliser in the fall of 1937 could not alone have saved the dry lands. The other essential ingredients were the great reclamation projects like community pastures, new farming and ranching techniques, specialized machinery and a revived people who were not left to self-destruct. Behind the survival of those desperate farmers of the 30's were the agricultural scientists who saved the day.

One quarter of all the arable land in Canada was threatened in those terrible, yet inspiring years. Gray's conviction was that Canada could not have survived economically or politically if that battle of men against the desert had been lost. Ladies and gentlemen, all that is part of our heritage. And what a heritage it is!

If we honour our heritage, then the future will honour us. Science is not a transient activity to be called into action from the shadows by our country only in times of seeming crisis. Unless science is sufficiently supported on a continuing basis in good times and bad, it won't be able to deal with crisis.

An effective and responsive scientific community cannot be cranked up overnight on demand. That kind of powerful instrument is the result of generations of development by generations of scientists like yourselves here today. Like Saunders. Like his son Charles who discovered Marquis wheat with the help of his father for the benefit of the economic development of the west. Like Fletcher and Criddle. Like J. H. Craigie who did such important foundation work on rust control in grain here at our Winnipeg Research Station. Dr. Craigie, by the way is 98 years old and living in Ottawa.

Properly nurtured over time, science can do its best work by preventing crisis altogether or mitigating its worst effects. Science is primarily a before activity, not after. Support for science is both investment and insurance.

Honourable science is part of the great continuum of human progress on this planet, despite the science applied to war machines and other foolishness. In Canada, it helped create our elaborate food production system, a necessity for and a monument to an advanced civilization.

Let me sum up my feelings about the role of science in our country. I have said before and say again that as a highminded nation, we pursue such central ideals as justice, equality and freedom for all. Their attainment comes in many ways, not the least of which is through science. For science gives substance to our dreams. My thanks for giving me this opportunity to say these words at this time, in this place, to this group.