**ADDRESS BY SIR DAVID BEATTIE TO
40TH ANNUAL CONFERENCE
Quality Inn, Nelson, 11 August 1987.**

Mr President, Ladies and Gentlemen

I am going to appeal to you people to listen to me as though you were a jury hearing a case presented with, I hope, complete impartiality and for you to give the verdict on just what has happened to our report which was produced nine months ago to the Government. Whether we have a fragile weak child after nine months or a lusty baby that may go on and grow up to be of some use will be for you to decide.

There have been several reviews of science and technology in recent years, none of which have been actioned by the Government of the day. Nobody complained to our Committee about the setting up of yet another one as most people recognised, I think, that this was the last chance for something to be done. Invitations were sent to 625 groups and individuals to present submissions to our committee which met between July and November last year. We held discussions with 301 individuals. It is not true as said by a Minister of the Crown that my committee and myself were brainwashed by scientists. I regard that as an insult. About 100 of the 301 individuals who spoke with our committee were people from the non-science sector, ranging from those supplying bulk food to those selling a wide variety of products.

Organisational Change

The first key area which we considered was organisational change. There should be a Minister of Science and Technology not holding any other Government portfolio. Both the Government and the committee also saw a need for a high level advisory body, which we styled STAB — Science and Technology Advisory Board, and the Government have now announced that this will be set up. There was widespread recognition of the need for greater accountability in research and the need for much more strategic research. We recommended two new research councils, a Science and Technology Research Council and a Social Science Research Council. The Science and Technology Research Council was to be modelled on the Medical Research Council, with a Scientific Director. There would be peer review by Advisory Panels, with a research budget drawn from both Government and University fund allocations. There would be a Council consisting of a Chairman and twelve members appointed by the Minister of Science. We also saw that social science research was very important and recommended the setting up of Social Science Research Council under its own statute to replace an embryonic Social Science Research Fund Council. This would also be modelled on the Medical Research Council. It would carry out work in either Universities or Government departments and would have a budget rising to \$3.3 million by 1991/92. Cross linking between those two councils and the Medical Research Council was also proposed.

Financing Science and Technology

We next considered the financing of Science and Technology and tried to arrive at an overall level of expenditure on Research and Development. New Zealand is near the bottom of the OECD level of research expenditure. Has New Zealand taken a conscious decision that countries such as Germany and Japan and USA are wrong in their high funding of research and development activities?

We observed that there was a noticeable lack of science and technology personnel in board rooms in most New Zealand companies. We recommended 150% tax deductibility to provide tax neutrality with Australia.

Education

If New Zealand is going to survive it must do better than its competitors. This will involve expansion of knowledge, based on industry, requiring more scientists and technologists. The population at large must also become more scientifically and technically literate. We are losing too many scientists and technologists abroad. There seems to be a complete mismatch between employers requirements and the abilities of the unemployed. Universities and technical institutes have increased in quality and size

over the last 20 years but there are still many problems. Our recommendations on education can be summarised, thus:

1. Changes in science, technology and mathematics teaching in Secondary Schools.
2. Longer Secondary schooling and that's controversial.
3. Trade training.
4. More post Secondary education.

Recommendations

It was recommended that the Working Party or some of its members stay in existence for a further period to consider in more depth the following matters.

1. Application of the user pays principle in science and technology.
2. Duplication of research within Government institutions particularly in MAF and DSIR.
3. Incentives for industrial research and development.
4. Venture capital.
5. Research in the new state organisations, e.g. DOC.

The difficulties in implementing our recommendations are:

(1) financial, (2) bureaucratic, (3) importation of research and development, (4) the time scales involved, (5) training, (6) the need for groups, (7) internal slowness and (8) low political importance.

If the recommendations of our report are not implemented New Zealand is likely to slide to the bottom of the OECD scale by the turn of the century. Research cannot be turned on and off like a tap. It takes 15 years to train scientists and technologists to be effective. Today's projects increasingly require the training of several people to work together in a group. The Science and Technology portfolio has had a low ranking in successive cabinets in New Zealand, but we hope that it will be possible to form a bipartisan policy on Science and Technology between the two major political parties in New Zealand.

After delivering the report we received dozens and dozens of letters and articles including some from Australia and Britain. A journalist in Britain came specially to interview me and the Bulletin of Australia included a special three page article on the report. Australian experts considered the report to be an impressive and convincingly argued document. Recent moves into lobbying by the Australian Science and Technology community have been successful although, relatively speaking, in New Zealand our report should have greater political potential. If the report is anything to go by Australians will have much to learn from across the Tasman.

British Report

The Lords' Science and Technology Committee dealing with research and development in Britain came out with its report seven days after ours was produced. Of its 16 points, 14 are precisely the same as in our report. For example the Lords recommended that advances in science technology which are essential to the economic recovery of Britain must be a central objective of Government policy. A recognised policy for the public support of R&D is required and new impetus is needed to raise the morale and focus the efforts of the scientific community in industry. Only the close identification of the Prime Minister with the science and technology dimension will ensure that it receives due attention.

A Cabinet Minister should be designated as the voice of Science and Technology. A new Council on Science and Technology should be set up, chaired by the PM herself or a senior Minister. The Lords backed the role of the Advisory Boards for the various research councils. The Lords decided there should be a cabinet minister acting as a kind of science deputy for the Prime Minister giving a strengthened scientific presence inside the cabinet office. They even suggested that a treasury minister should do it and the Lords noted, very tartly, that requiring a treasury minister to speak to the science and technology brief in cabinet would eventually upgrade the treasury's own understanding and appreciation! Such a development could only be to the general benefit but it remains disturbing that a department as powerful as the British Treasury has a definite blind spot in science and technology. Much of the report is about attitudes and greedy Government departments which insist on putting their money into short-term work.

Our report has come to similar conclusions.

Reactions to the Report

Dr E.F. Bollard said with very few exceptions, science and technology has not been well served in New Zealand by the media. There is a degree of cynicism about this within the scientific community and less effort has thus been made to develop relations with journalists. The Auckland papers have essentially ignored our report. Dr Bollard has also said that Australia has declared, as a national objective, that it must increase its exports and technologically-based products. In New Zealand at present, the rate of the national return seems to be the governing factor in deciding whether New Zealand based organisations should produce products onshore or offshore.

Of the hundreds of letters received, one from a colleague, a former president of the Manufacturer's Association, Sir Earle Richardson, puts it much more bluntly than I could. What Sir Earle wanted to talk about was the great possibility of an integrated nation, an integrated economy, an integrated business. He said "New Zealand must be one of the few education systems in the developed world today to be continuing to produce untrained labour. When I see the standard of young people coming through to secondary industry I can't believe that we are being asked to slug it out commercially with the world's best. In Japan 90% of youth go through the senior high school and more than 30% of them go into tertiary institutions. In New Zealand only 52% of third formers carry on to sixth form. At best 25% start some form of tertiary education." He goes on to say we should now acknowledge that our educational system is amongst the worst in the world and certainly the least attractive amongst our trading partners. "We are educating for unemployment instead of employment and need to revert to the basics of education, accepting achievement and failure and rectifying accordingly. One of the most radical and difficult changes needed is in the attitude of top management of industry, commerce, unions, the public service and the Government in this country. The Beattie report should be instituted as Government policy; after all the Government asked for it. It is unbelievable that the youngest cabinet we have ever had, with the most university graduates, can so pointedly ignore the needs of this nation in science and technology."

Another letter from a senior scientist at the Ministry of Works and Development Central Laboratories expressed concern about the declaration of 30% staff cuts in the MWD research and development group at Gracefield and the resulting confidence crises amongst the staff. The Hamilton City Council through the mayor wrote to say that they had studied the report and were going to examine the possibility of establishing a science park in Hamilton and they were hoping that the report would receive the appropriate attention from the Government. Victoria University of Wellington met and passed a resolution to strongly support the report.

The Chairman of the Broadcasting Corporation, Mr Hugh Rennie, made some very trenchant comments in an address he gave called "New Zealand in the 1990's, technology conquered or conquered by technology", in which he traced the history of scientific knowledge in this country in a very thorough fashion. He said this: "When we have conquered the rules and learnt the building blocks and can apply our distinctive interpretation to our own needs we are then mature. Then too knowledge is our servant and not our master". We are going backwards in our response to technology. Why should this be so? He focuses on three issues. The fundamental insecurity and growing instability of our society, a decline in our respect, commitment and support of education and third the centralised economic power over our Government's financial system by the Treasury. He goes on to deal with those topics. In tackling the problems, education is the most promising weapon and he asks why are the heroes of our society never the educators and only rarely the researchers? We need an immediate shift in our values and our priorities. We need to know why we have allowed 'user pays' to stall and push back advances in our technological education and why we have left only financial elements as the part of the equation which determines the education we provide. The centralised economic power which is represented by the Treasury began in a small and straightforward way but, once established in the system, became a point of power to which we have gradually added more and more authority.

As we built society we have used time and again the power of the State to undertake

business and economic activity. Treasury has now been interwoven into the fabric of New Zealand society. When it is said that Treasury acts at the request, and on behalf of the Government in the interests of the people this is superficially true. The social, education, scientific and technological matters which Treasury controls are at the heart of the question. The result is an unhealthy single concentration of power based on only one part of human knowledge and expertise. It gives privacy and decision making to economic and administrative matters above all other considerations. Put in private enterprise terms the Treasury is the shareholder, the directors, the general manager, the accountant, the corporate planner and the auditor in our nation's business. Such a concentration of all these functions in one common set of hands is not justifiable. This is not strictly an attack on Treasury, but an attack on the concentration of power we have allowed to develop in a single place in the structure of our State.

Members of Parliament then started writing to me and sending me copies of their speeches. Referring to our report Margaret Austin, MP for Yaldhurst, gave a clear and authoritative statement that provides a blueprint for policy for the future. The report points to ways of bringing together the management of research and development, the scientific community and the national interest. She suggested that science and technology and social science councils are needed as well as the Medical Research Council to implement priorities to be established by a science and technology advisory board in conjunction with the Government. The proposition has complete coherence. It recognises the under-utilised research resources within universities and points the way to greater collaboration to effectively use facilities and expertise. She said that the wide acceptance of the report by the scientific community in industry gives us in the Government confidence in tackling the way in which the recommendations are to be implemented. She set out the figures on our research and development as a percentage of GDP and how low it is by comparison with other OECD nations. She agreed with the doubling of expenditure on research and development by 1993/94 but she is not persuaded by the argument that we ought to adopt the Australian policy because there is evidence that there are distortions created by the 150% tax deductibility for research and development.

Mr Simon Upton, the Opposition spokesman for science and technology, believes that we are likely to see action only in limited areas of the report. He agrees with the establishment of the science and technology advisory board, but just because Australia has a particular tax incentive this does not clinch the argument for New Zealand. He said it is very important to forge the link between industry and research organisations. However, every time a link is made Treasury will claim that there is no longer a need for Government to support research and development. He has very little criticism of the Medical Research Council procedures and agrees with our proposals for a science and technology research council. In order to get the new system to work it would have to be given sufficient money, but it would not be possible to do it as proposed in our report. It would be necessary to put more DSIR and MAF money into a pool to discourage competition and encourage more collaborative ventures.

Support also came from the New Zealand Market Development Board, headed by its chairman, Mr Peter Shirtcliffe, who wrote to the Minister, Mr Tizard, supporting the report and suggesting it be urgently implemented. Mr Tizard sought comment on the report from Government departments involved such as education, MAF, DSIR and the Treasury as well as universities, polytechnics, private firms, the Royal Society and other interested groups. Once any consensus was reached Mr Tizard would be able to take the matter to the Cabinet. The budget came out on June 18 but there was little or no reference to science and technology in it. On June 22 Mr Upton claimed that the Government had rejected the recommendations in the report. Mr Tizard, on the same day, denied this and said a working party was studying it. On June 23 the Dominion came out with a leading editorial "Is it too much for research?". Later that same day Mr Tizard announced a high profile science and technology advisory board would be set up in line with our recommendation and funds were available for that purpose. He was taking the proposal to the cabinet marketing and development committee. He said the element of jealousy between Government departments had not been dealt with by us, which was why the Government was not able to act on the recommendations in our

report immediately. However, what we had said was that we needed more time to look at the rationalisation of MAF and DSIR than was available in the five months given to produce the report.

Treasury has been critical of the proposal to establish three research councils to distribute research funds. They were critical in a statement produced virtually on the last day we sat as a working committee, but we rejected their criticism as being against a very solid weight of evidence to the contrary. As Mr Hugh Rennie says, why should Treasury venture into these areas? Two research councils are already established, the Medical Research Council and an embryonic Social Science Council. The Medical Research Council does not mind being part of the suggested system and we want a Science and Technology Advisory Board apolitical for its advice with no finger in the till.

The New Zealand Institute of Chemistry was typical of many groups and passed a resolution on July 1 that those present at the meeting endorsed the thrust of the report and deplored the lack of progress by Government in adopting and implementing the recommendations embodied.

After the Minister released the Labour Party Science and Technology Policy, a newspaper headline read "Labour tells scientists to seek cash". According to the Government scientists could not always look to the Government for funding. Levels of Government spending on research and development were comparable with those overseas, but private levels of spending in New Zealand were lower. The bulk of increased research and development spending must be encouraged to come from the private sector he said. The Minister is accurate in that statement. The Government's contribution is as tight here as anywhere in the world. The user pay trend does not mean the Government will neglect its responsibilities in funding non-appropriable research which will benefit society generally.

On July 15 the Manufacturer's Federation President stated "Manufacturing in New Zealand is withering. There has been a woeful downturn in manufacturing investment and a lack of support for our proposals. That the government has called on us to support research was a real worry to manufacturers."

On Friday, July 24 Mr Tizard addressed the University of Auckland group stating that the recommendations before Cabinet for the formation of STAB had been approved in principle although the detailed programme had yet to be approved. He was proposing an advisory body of relatively small size, probably five to seven people, one or two with a University background, one in a pure science research field outside Government or university and two with technology or finance as their main field of interest. The group would advise him directly as to how to manage the various recommendations of our report. He would then decide how to work the proposal for funding research by peer review. He was studying the 150% tax incentives in Australia but Treasury was not convinced. He was confident that STAB would be up and working in a matter of weeks.

A document I would particularly like to refer to is a speech by Senator Button, Minister of Industry, Technology and Commerce in the Federal Government, a very high ranking Minister in the Hawke Government. He was Minister of Industry and Commerce, who subsequently took over Technology from the Hon. Barry Jones. Contrary to the views of Mr Caygill and Mr Upton, Senator Button stated that one of the key factors in encouraging industry to fund research and development projects in Australia is the 150% tax write-off for money spent by a company on research and development, either in-house or contracted to other companies, tertiary institutions or to organisations like CSIRO. The concession is restricted to incorporated companies and to R&D carried out in Australia. The full concession applies only when a company's annual R&D expenditure exceeds \$50,000. For all R&D contracted through an approved research institute the concession applies on a sliding scale between 100% tax write-off for \$20,000 expenditure to 150% tax write-off on \$50,000 expenditure. There are also grants for industry research and development called GIRD. It provides a discretionary grant, particularly directed at small, high technology companies involved in industry restructuring where the applicant is unable to derive the full benefit of the 150% tax concessions and the project would not proceed satisfactorily without grant

support. Management investment companies can obtain attractive tax advantages if they are set up for the purposes of investing in R&D and in high technology. These have been of considerable assistance to new companies which are now starting to turn from high risk ventures towards more mature investments. The impact of the above schemes has been quite dramatic. Registrations under the tax scheme indicate that companies will spend \$1.2 million on research and development in 1986/87. The increases have lifted private sector research and development as a percentage of GDP and our figures now start to pale in comparison. I regard this speech of Senator Button's as an important document to answer what our Ministers and our opposition spokesman are saying in this country.

Ladies and Gentlemen of this jury I want to put my case to you. If you have a case and you have an argument which is rebutted by the Treasury of this country, then I submit that information cannot be accurate. Therefore I intend to keep pursuing it until some stage, somewhere, we will be able to get something done for science and technology in this country.

ANNUAL REPORT 1987-88

A.J. Popay

The 40th Anniversary Conference was held in Nelson, 10-13 August, 1987. The conference was opened by Dr Roy Harrison who gave conference delegates a nostalgic trip through 40 years of pest control.

As expected, the number of papers was slightly down on previous years with 49 full papers and 11 research notes presented. The programme was supplemented by an interesting address by Dr Oliver Sutherland on 'Genetic Manipulation of Plants for Pest Resistance' and an after dinner speech by Sir David Beattie on the subject of the Science and Technology Report. Sir David's address is published in this Proceedings.

The Annual General Meeting accepted a proposal for a new student's award worth up to \$1000. The award should be available to applicants later this year. A proposal for a fourth category of membership, that of Associate Membership, was also passed. This will allow students and retired members membership of the Society for half the cost of a full subscription.

An award was made this year to Mr Paul Wright, a student at Lincoln, to assist him to attend our 1988 conference in Auckland and a conference in Australia.

Membership of the Society remains stable at about 400 members. The Canterbury local branch has gone into abeyance but the Hawkes Bay, Nelson and Waikato branches remain active.