

SLADE MEMORIAL LECTURE

TOOLS FOR THE CLIMATE INDUSTRY

by K.J. Mitchell

When I was asked to deliver an evening lecture for this NELCON Conference at Massey University my thoughts turned to a report on the establishment of television in New Zealand. That report was written by Ralph Slade and it became the unofficial white paper on the matter. At that time it was not known to me that this address was the Slade Memorial Lecture and it was not known to the organising committee that Ralph Slade and I had had close association.

Inquiries were made to locate that television report and the results are an interesting commentary on our Kiwi style. The report was well remembered and everyone was keen to help. Inquiries went first to E.D.A.C. the electronics firm Ralph Slade established and which was his base for those years. They produced the eventual answer that the firm's file and strong room had been cleaned right through and the best they could get was a tattered page 5. The Manufacturers Federation had the records of the Conference at which this report had been presented and of discussion on it, but no sign of the report. Industries and Commerce who were known to have used it as a basis for their policy recommendations located the covering letter for its transmission to them and the envelope for holding the report. However, the envelope was empty! So much for our handling of such documents.

We balance against that aspect such as these. The broad ranging assessments made in that report have been proven sound by events; that EDAC played a large hand in the flowering of the electronic and the television industry; and finally that the hotel to which we used to adjourn after discussions at Lorne Street, has, I am informed, remained the operating centre for such matters despite their having shifted to another site.

Now for the Climate Industry. What is it? It is the industry concerned with the utilisation of this country's major source of energy. This is the energy which comes at an average rate of 10,000 kilowatt hours on each acre of our country every day of the year. If we now consider that we have 20 million acres on which that can be quite efficiently utilised, it will be seen that alternative sources of energy pale to minor proportions in comparison.

Our plants are the initial steps for that energy. They do the initial steps of transferring that to usable, salable forms from which we can build this country - build it both in economic terms and in the quality of life terms. The two are in fact identical provided those already well set up don't take an "I'm all right Jack" attitude; and remembering that such centered attitudes may come equally from complacent manufacturers and vocal conservationists.

The next point to be clear on is that the industry which handles the processing and marketing from that energy source is a big operation in modern international terms. Not one of the world's giants but still a big operation. With an annual output of approximately 1500 million dollars it is comparable in size with the British I.C.I. It is our N.Z. industry: the New Zealand industry.

At this stage you may be judging this an elaborately dressed up description for our farmers. That is not so. The essential point to be made is that this industry of ours, is, and has to be regarded as, a unified whole from the initial energy conversion through processing and on to marketing of the final product. In this, its essential operating requirements for success and continuing viability in the international market place are no different from that of any other industrial chemical process industry. The fact that it uses for some of its steps biological rather than other forms of industrial process conversion must not confuse the issue. Equally as the industry continues to develop and hold its own in the world production and marketing amphitheatre, physics and all its technology derivatives do and must inevitably move to a much more equal partnership with biology as the basic science underpinning its efficiency. Also the further this goes the bigger the part electronics play throughout all stages of the production and marketing operations.

This is the background which you need to think of when considering the contributions of yours and similar skills to this our New Zealand Climate Industry. It clearly calls for and requires the use of sophisticated production technology. Having emphasised that, I have now to point out that a number of sectors of the Climate industry are doing so, very well indeed. The Minister of Science made this point recently when he said "This is strikingly illustrated in the single giant Te Rapa milk powder factory of the N.Z. Co-op. Dairy Company, whose potential annual output is expected to exceed in volume and value that of the New Zealand Steel Company. Because of the high degree of automation at Te Rapa, output per unit of labour is many times that in the steel works". Further, consider that the Te Rapa factory run by a New Zealand organisation came onto production smoothly and quickly. Contrast that with events where production based on reasonably advanced technology has been started up in sectors outside the Climate Industry by New Zealand organisations. There has often been faltering, or eventually dead stop, progress. Mention of the Whangarei Glassworks, the Shannon nylon plant or the Waiuku iron and steel works should be a long enough listing to make the point. In our Climate Industry understanding of how to use modern process production technology has proceeded very well and on a large scale.

If there are lingering doubts on the technology or scope of its operations, consider the New Zealand Forest Products Company's enterprise; or note that the monies the Climate Industry earns our country from its export of offal alone is still substantially above the export earnings from all the other industries put together. You may still find such comments hard to reconcile with the established image of the farmer with mud on his boots, cow dung sprinkled elsewhere and either too much money or too much moaning when he hasn't as much as he would wish. That image conceals the real situation of a large scale vertically integrated industry with a series of processing steps. That some of these are biological, processed through plants, cows, sheep and beef cattle, is because in utilising our natural resources they offer higher technological and commercial efficiencies than do

alternatives. That can and should continue with full competitive facing up to so called "synthetics".

Similarly, we have developed our forms of farming because they were in time past, the most efficient form of commercial organisation for the production, the transport, and the marketing technologies then available. As such there are no apologies ever appropriate to even the most sophisticated electronic operator of integrated circuits or any equivalent. Complementary to this goes understanding that major developments in production technology almost inevitably need equivalent adjustment in production organisation to allow efficient use. All industry stages need to move and reorganise be they in the factory, out on the land, or the marketing and distribution. If they don't, the same rule applies as for any other industrial corporation. Somebody else takes your business and all participants in the industry suffer unless a country chooses to promote or to demote an industry to being an offshoot of the Social Welfare Department.

This then brings us to considering what is involved in keeping our Climate Industry's production technology in the forefront so that we as a community can continue to maintain the benefits of living and livability established for us by the efforts and foresight of our predecessors. Here it is appropriate to turn for guidelines to Ralph Slade's career in bringing new technology to a country; to the distillation of the wisdom which he had learnt over the years and which he set down in his T.V. report; and also the lessons given by those new ventures mentioned earlier which haven't fared too well.

In this I vividly remember his "over the glass of beer" description of how they in the 1920's lifted an uncertain Post Office organisation into the radio age. It was only later one realised that much of the thrust had been based on his own personal spectacular demonstrations of its potential. He stayed with electronics, he made major technical and organisational contributions during the war years, then early 1950's he backed his faith. He moved out from the relative comfort of a large commercial organisation to found and lead EDAC, Electronic Development and Application Company. It set out to demonstrate there was good commercial return in developing and applying electronics. After twenty years of immense development into the whole fabric of your electronics operation it may be hard to conceive the daring of that step. It is worth mentioning that as part of the operation Ralph, and Les Fuller who was Ralph's main off-sider and is now the firm's Managing Director, proceeded to sew up the majority of the New Zealand transistor market and hence provide the cash return basis from which the other development aspects could be implemented.

It was at that stage when EDAC had just come in to operation that I established contact. I had heard of the man who had set out to show that electronics could do things for itself. Incidentally some stimulus from a senior DSIR officer may well have been the final catalyst. We were looking for electronic systems required for development of controlled climate systems as research and later industry operating tools. We sought them economically.

At that time, Government and University physicists had their gaze mainly toward the stratosphere, or the atomic nucleus. Ralph was prepared to give it a go and to put his men on to it. He took us through those introductory stages of technique understanding and system establishment from which our own men could take off. He then played a key role in the next

uncertainty phase. That is standing off the then inevitable challenge from an institution in the other island.

From that start it is proper to mention that a group of local New Zealanders proceeded to create a Controlled Climate Laboratory which achieves twice the performance of the best overseas and does so at half their cost. At such time as it receives the resources to run fully, it will produce equivalent results back to the industry.

Then television came onto the New Zealand horizon. When the country got to the stage of somewhat uncertainly wondering when and how it should take the leap into that new era of entertainment, Ralph moved with his T.V. report to clarify what really were the issues the community was dealing with. He brought out that there was far more to this than making a large-expenditure on an entertainment; that the community at large was in actuality financing a major investment in new technology both in the equipment and particularly the training of men to use it; and that this was in effect establishing a major pool of technological expertise to which industry would then have immediate access to develop its own standards of operation. From his previous experience he mentioned the same for defence. The message here is the strategy of the longer range consideration of the technological scientific skills which an industry needs, and often which many of the industry managers don't realise they are going to need. Along with that goes the strategy of indirect and preferably community financing of the training required to create those pools of skills.

This is relevant to any industry but it is suggested particularly so to our Climate Industry. From the historical fact that major sectors of the production used to be accomplished out on the 'arm, and that best marketing, used to be a very unsophisticated operation, the tradition has been established of the farmer himself dominating industry outlooks. That is essentially the individual owner operator farmer.

This has long range strengths. It also has dangers. The latter arise particularly from each farmer individual being on average, but inevitably, mainly concerned with optimising what occurs in the immediate year to year future within his own farm gate. The pressures of paying the mortgage, getting a car, or a decent dress for the wife are much more real than are the vaguer longer term industry and national investments. Irrespective of how much such longer term investments are appropriate to ensure that a major internationally trading industry remains standing on its own feet and will be competitively viable in the decades ahead, they tend to be regarded as frivolous additions to his immediate farm costs. Recognition of the need for these longer range investments and that community as a whole is involved with the viability of our national industry, is shown by Government's f

It is shown also in the concept underlying the development of this Massey University as a full University with particular emphasis toward the Climate Industry and the broader needs of the community participating in it. Those conceiving, implementing and backing that merit our unreserved tribute and thanks. However, having got onto its feet it is to be hoped the University doesn't now fall into the trap Ralph Slade drew

attention to. That is educating to meet the presently felt needs of the industry, rather than also training toward the needs the industry will have in the decades ahead.

On that matter recent decisions in relation to its handling of physics are cause for concern. For a number of sectors of the complex processing and transport operation which is emerging in the Climate Industry, sectors of physics become, as mentioned, the key underpinning science. That is particularly for heat and mass transfer, for electronics and for control and communications systems. When faced recently with the question of establishing a Department of Physics, the University gives every external appearance of having retreated not into its shell, but into the much more restricted confines of the biological cell. It gives the appearance of a nervous maiden thankfully responding to blandishments against venturing out into that rough world around about.

Although on a personal basis one does have sympathy at this occurring, on an industry basis the issues become rather larger. The issues appear exemplified by those three non- climate industry technological ventures which hit or have gone close to the rocks, namely the glassworks, the Shannon nylon plant, and the iron and steel plant. In each case there was a dearth in the country of the scientific and technological skills required for the successful operation of those processes. In each case there appears to have been acceptance at critical times of the concept that the key skills can be bought at short notice from overseas as distinct from being born and trained here. The main requirements for launching need to be adjudged finance and a suitably optimistic set of accounts and protection arrangements.

The limitation of such thinking is that the size of enterprise they were handling was not great enough to stand the cost of financing or otherwise attracting from elsewhere men of adequate calibre to ensure sound technical decisions were implemented. In that case the promoters have to either riskily hire outside that competent group or accept the standard price for an overseas organisation to provide adequate quality of technology, namely overseas control. We note also that although such takeover hasn't occurred with the New Zealand Steel Operating Company it still proceeds without a New Zealand scientist or technologist with appropriate skills on its Board. Who doesn't adequately trust who, and what is the price tag we are paying for that?

The aspect which emerges is that for new technology to be built into an industry it must have ready for it the skills it will be calling for in times ahead. Further they must be built in with men who are established members of the community, trusted and understood by the managers and financiers who share responsibility for an industry's health. In the long run you do that reliably only by breeding and training your own.

It could be fairly said that the enterprises given as examples would never be of a size in New Zealand to justify the expense of establishing in anticipation a generalised pool of appropriate skills. It is submitted that such grounds do not hold for our Climate Industry. It is further submitted that the Climate Industry is and must continue to become very much more an engineering as distinct from a dominantly biological industry. The engineering won't stay just at examples such as the Te Rapa milk plant or

the Forest Products complex. It will move strongly into transport and marketing; and into many other forms 'of processing, the products from that climate energy. Further, it will move out onto the land so that our handling of the cow, the beef animal, and very often the sheep, will, in its organisation, its equipment and the training of its men come to resemble the factory rather than the farm.

Now you as members of this National Electronics Conference know that physics must be present to give such an operation its broad base and that it is electronics which really makes the operation sing. Electronics provides the automation, the control systems, the communications, and the leisure pleasure; all of which go to ensure that the men involved take a pride in being master rather than servant of the operations. Doubts may be expressed on whether this industry can afford electronics and all such things. The very efficiency of an industry can encourage reluctance to be involved with new production technologies which can bring in radical changes. These outlooks can come from operators or administrators. If believed, they lead to failure to invest in the future and to the adverse economic and social consequences that go with that in the longer term. The comment to be made, is that our Climate Industry is too big and has too fine a record to ever fall for that. It will increasingly make large calls on you and often in un-expected directions.

From knowing personally how much the man we are honouring, lived for such new technology, I hold it a privilege to have delivered this Slade memorial address. One recalls almost above all else the hard-case merry twinkle in his eyes as Ralph saw through his and your industry's accomplishments.