EDUCATING, MANUFACTURING, EXPORTING*

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Export of manufactured goods will play a large role in the economic future of Australia, and manufacturing will be closely linked (in markets and investment) with the Pacific rim countries. Strategies for development are proposed, recognising the need for improvement in cultural outlook, technological credibility, research and development, and education and skill development at all levels.

Keywords: education, export, foreign investment, manufacturing, product development, productivity.

INTRODUCTION

I propose to provide firstly an economic background and then to indicate how I see the Australian culture relating to education needs in a technological environment; needs that are related to our survival; needs related directly to the necessity to export Australian manufactured goods.

In these days of tripartism, at least in many parts of Australia, I have a foot in three camps of involvement. The camps are industry, government and science, and I am continually surprised and often disappointed at the extent to which, in many activities, they remain discrete entities.

The first — industry — entails my day-to-day enterprise involvement as chief executive of Mitsubishi Motors Australia Ltd., a manufacturing enterprise employing 4,200 people, and with sales of $950 million. And when I talk of industry, I am not just talking of a car company. Seventy per cent of our costs are incurred in the purchase of components and goods from Australian manufacturing industry. The car companies' umbrellas are quite embracing. Secondly, in these corporatist days, there is my involvement with government as a member of the Australian Manufacturing Council, and as Chairman of the Automotive Industry Council. And thirdly, there is my involvement as a member of the Executive Board of CSIRO.

* The Colonel Daniel E. Evans Memorial Lecture 1986, presented at The University of Queensland on 8th October 1986 by arrangement with the Faculty of Engineering and the Department of Mechanical Engineering.

Universities — in fact all tertiary education institutions — have a major role to play as a catalyst in bringing together not only business, government and science, but also the people of Australia to encourage enhanced industrial development and technology. Our overall objective must be sustained technological development for the betterment of the total community.

THE AUSTRALIAN ECONOMY

In the second half of 1984, the Business Council of Australia worked on a major policy document entitled *Revitalisation and Structural Adjustment of the Australian Economy*. I recently perused that paper again. It is interesting to note the shift in emphasis of priorities that has occurred since then. At that time, the emphasis was very firmly on ways of achieving more jobs and higher living standards. The means to achieving them still apply. They are:

- Attitudinal changes on the part of management and employees;
- changes in business and work practices; and
- incentive structures to encourage successful and productive activities.

But what *now* are the priorities? How things change in two years! The emphasis is on holding the line — preserving jobs and keeping the lid on rising unemployment, and facing the reality of falling rather than rising living standards, at least for the time being. The preoccupation now, in the macro-economic framework, is with the size of the current account deficit, our large external debt, the unfavourable movement in the terms of trade, the value of the Australian dollar, unacceptably high interest rates, and the level of Government spending.

So far as the private sector is concerned — perhaps I should narrow this to the manufacturing sector, because that, of course, is where my particular interests lie — there are indications that we are becoming competitive vis-a-vis our competitors, and current tripartite attitudes in employer/employee relations, such as moves on work practices, are encouraging. There are opportunities being thrown up as a result; but the economy at the present time is like an invalid that needs nurturing. The ambient conditions must be right. They have not been lately, with currency speculation, interest rates which have cut savagely into domestic growth and militated against domestic investment on the part of the Australian companies, and additional tax imposts, particularly in the form of higher corporate taxes and the fringe benefits tax. One has only to look at the results in my particular industry. There is the economic background. So, before becoming specific and technological, let us examine the environment in which we currently work, review it and decide if we are focussed correctly. Are we focussed culturally in the right direction?

CULTURE

We perceive ourselves as multi-cultural, but are we really? We still hide protectively under the English-speaking umbrella and the history — whether you call it legacy, stigma, scar or tattoo — of White Australia is still quite vivid in our attitudes.

Signals that we should change began emerging quite a few years ago when the European Economic Community was formed, but we ignored them — despite the huge volume of business our miners and primary producers have been doing with Pacific rim countries.

Our manufacturing export future is clearly linked with Pacific-bordering countries, and I suggest that of those countries, the biggest opportunity lies with Japan. We must ask ourselves some questions. So far as academia is concerned, are our sabbaticals spent in Oxford or Harvard or M.I.T.? What are we doing to establish cultural and academic ties with Japanese universities? They must be doing a good job. Have we discovered how they are doing it and what they are doing? What are you doing to ensure that the teachers you are teaching to teach, or the undergraduates you are teaching to learn, or the researchers that you are guiding, are at least headed into the right part of the world?

We must develop in our society on outward-looking, manufacturing-for-export culture, and of our target markets, Japan must be pre-eminent. We have been too long in the darkness and shame of xenophobic import replacement influenced by our colonial heritage and protection-oriented governments. Japan is the centre of influence for the future in this sector of the world, and we must recognise and take advantage of that fact.

It is easy to say what we must do. How must we do it? Frankly, I think Queensland has a greater perception of this than other parts of Australia. There are two elements of culture I am emphasising — outward to Japan and manufacturing. I have already talked a little about culture, and I shall talk some more later, but let us talk a bit about capital.

CAPITAL

Australia must attract the right sort of investment and I am saying that in the case of industry, we have the potential to attract capital from our target for exports — Japan. One of the consequences of getting Japanese money and technology into this country is that our industry will automatically benefit from Japanese industrial sales expansion to the rest of the world. There is a lot of Japanese investment capital available and it is not seeking out the short term high interest return that Australian and European money is seeking. Japan does take the long-term investment view.

If we study other Pacific rim countries, we can divide them into two broad groups — the first is Korea and Taiwan, which I shall call Group 1, the second is Thailand, Malaysia, Singapore and Indonesia, which I shall call Group 2. They are all our competitors for the Japanese investment dollar. But Korean and Taiwanese currencies are very strong and will probably strengthen further, and there is already trade friction between USA and these two Group 1 countries.

It is perceived that the Australian dollar will stay weak, compared with the yen, for some years. It is also perceived that the Group 2 countries will stay weak for some years. Without tracking through the complete train of economic logic, who are our competitors for that investment yen? The Group 2 countries, the ASEAN countries are our competitors in the race for the Japanese investment dollar. We must set our sights to beat them in the investment stakes, and I can tell you we have done a pretty poor job so far. Our competitors are those countries which we, as a nation, have perceived as being industrially and intellectually inferior to us. (I do not want to sound like Prime Minister Nakasone when I say that.) We, as a nation, must prove to Japan that we want them to invest with us and subsequently buy from us; that we want to sell to them high quality products in reliably shipped quantities. Right now we are not even contenders! Those 'inferior' Group 2 countries are way out in front.

Japanese people feel comfortable in those Group 2 countries. If they invest there, those people will do what they are expected to do. The technologists are eager to learn new ideas that the shareholder wants to transfer. The engineers and managers and the employees are willing to adopt systems and procedures with which the investor-customer is confident and comfortable.

Australia's cultural behaviour epitomised by our know-all reactionary attitude and supported by our restrictive immigration policies and our jingoistic "she'll be right, throw another prawn on the barbie" attitude does nothing to attract Japanese investment and subsequent export markets. I accept that tourism is a great industry for Queensland and other parts of Australia, but it is not going to save us. It must not consume us. But we can change because we can see our problems and it is your job and my job to change it. By improving our cultural attitudes, we can facilitate transfer of knowledge, technology and subsequently, investment. Not only must our cultural attitude improve, but also we must get some runs on the board to attract the investor and establish our credibility.

STRATEGIES

Our strategy for developing manufacturing exports can be seen in at least two, and maybe three, phases. The first phase is to export

components that are readily replaceable in Japan, i.e., they are manufactures that are not integrated into the product design, e.g., in the automotive industry, glass, tyres, castings. We can encourage a 'fast start' which can develop the seller-customer relationship and, in particular, develop Australia's awareness of quality standards of the customer — the world. Quality awareness and practice must be a keystone of our efforts. Any research in Japan will show that if Japanese *know* that Australia has any manufacturing expertise, they perceive low quality and delivery performance — just as we perceived Japan in the 1950s! The first phase could be called in some circles a low-tech phase.

The second phase is export of products resulting from increased technology transfer, education and investment. Perhaps the phase could be sub-divided further — into short and long term. The strategy I am offering is unsophisticated and straightforward, but involves hard work. Indications are that with the currency depreciation leading to greater competitiveness, and a glimmer of potentially better relations between management and labour, there are promising signs on the horizon.

As a member of the Australian Manufacturing Council, I have been involved in the evolution of a statement for a broad strategy framework for manufacturing industry. The statement represents an interesting foray by a tripartite forum. I believe the statement is sound, and has something to say. It was agreed by the employers, unions and government.

> The Australian Manufacturing Council believes it to be neither prudent nor effective to rely solely on exchange rate adjustments to achieve the changes necessary in manufacturing industry.
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> For the sector to achieve an increased rate of exports, replace imports and provide opportunities for employment growth, a strong increase in manufacturing investment and productivity will be essential. However, investment will only occur within a favourable economic environment, which includes expectations that there will be sustained market growth and continued improvements in cost structures, industry profitability and interest rates. Productivity growth will depend both on the needed increase in investment in new technology and on improved performance of management and the workforce. This will require better human relations in industry and upgrading of management and workforce skills.

The AMC considered there was need for a broad strategy for manufacturing which will complement individual sectoral strategies, help set the environment conducive to increased growth and improved competitiveness, and complement the improved price competitiveness resulting from the real change in the exchange rate. The major elements of the strategy can be summarised as:

1. Provide a growth environment — i.e., sustain a higher rate of growth consistent with a low inflation and increase the rates of aggregate domestic saving and capital formation, including reducing and then stabilising real interest rates;
2. Enhance Australia's competitive strengths; and
3. Enhance Australia's work force skills.

WORK SKILL

The Economic Planning Advisory Council noted in its recent paper, *Human Capital and Productivity Growth,* that the Australian workforce has considerable skill deficiencies when compared with countries such as Japan, West Germany and Sweden. These deficiencies have contributed to Australia's poor-to-average productivity performance and to our loss of international competitiveness.

In those countries where there is a commitment to developing the skills of employees at all levels, and an appreciation of the ways in which technology, work organisation and employee skills interact in the production process, there have been significant returns in the form of better products and higher productivity. As an example, a recent study of comparable British and German manufacturing plants showed that the superior performance of the German firms was due less to advanced technology than to the more careful training of production workers, and to the superior technical skills of tradesworkers and supervisors.

These lessons from our international competitors are beginning to sink home, and local initiatives such as the Work Skill Australia program, which identifies and encourages skilled excellence on the workshop floor, deserve much greater public awareness and support.

Just as we must encourage and teach specific work skills, we must also teach our workforce to be multi-skilled and flexible, to be aware that they are part of the world economic environment and that engineering for quality production and export using the latest gained knowledge from wherever it might be, is essential for survival. Dyed in the wool "Keep out of my patch" demarcation attitudes must be changed — and they do not exist just in the blue collar workforce.

I am underlining the education and skill of the workforce in this environment and saying very loudly that educating and skilling the workforce is your job and my job. I am here to put things into a very real perspective. Rhetoric and theory is not for today. Let us look at some other opportunities.

RESEARCH AND DEVELOPMENT

Much has been said about this in recent times. I believe we must work much harder in business, CSIRO and tertiary institutions to marry science and technology research in Australia to that in Japan and other selected countries, with a specific view to developing manufacturing opportunities for Australian manufactured exports. By getting a bridgroom or a bride, not only do we get the investment, but we will get technology sharing and world-wide marketing expertise and networks. If we have a uniquely valuable, potentially commercially viable product technology developed in Australia, foreign companies must be encouraged to help develop that technology and set up operations in Australia to produce and market the products.

Sirotech, the commercial vehicle of CSIRO, has already put together some deals along those lines. One of them is a company called Dunlena — a joint venture between CSIRO and Dupont Australia to manufacture and supply pesticides. The science was developed by the Division of Applied Organic Chemistry. The opportunities were identified by the highly entrepreneurial David Solomon, Chief of that Division, and subsequently formalised and professionally developed by Sirotech. The compounds are now being screened and the chemical technology for processing the compounds is being conjointly developed by Dupont scientists in USA and CSIRO scientists in Australia using pilot facilities established in Pennsylvania and at Fisherman's Bend. After about another three years, there will be an investment in plant and facilities here in Australia.

Management of operating the venture is controlled by a Board consisting of members from Sirotech and CSIRO — 51 per cent of shares are Australian owned.

Z Tech Corporation is another example. This is a joint venture owned 85 per cent by ICI Australia and 15 per cent by CSIRO. The company is based on the technology developed by the Division of Mineral Chemistry for the production of high quality, very high purity zirconia. Recently, a company in the USA has been bought as part of Z Tech to provide greater international markets for high value, high quality, Australian-made products that will ultimately be made at a new facility in Kwinana.

Research establishments must review their programs and select and nurture the ones that are technologically competitive. Sirotech can help in this analysis. Sirotech can also match-make with companies or other institutions that have complementary technology. I am not here just selling for CSIRO and Sirotech. I am aware of the marketing, investment co-ordinating companies that have been formed by tertiary

institutions throughout Australia. The point I am reinforcing is that we must not just sell science. We must develop export opportunities.

EDUCATION

Just as research science is being pushed and pulled into manufacturing orientation and we all piously say "and so it should", so must education funding be channelled towards national need. The national need is manufacturing for export. In relative terms, law schools must get poorer and engineering schools must get richer. But engineering schools must also realise that they must urgently review their curricula. I know it is difficult, but at the least, the current subjects of basic principles must be taught in an environment of manufacturing. Attitudes, practice and syllabus programs in tertiary institutions must change into a positive focus towards manufacturing.

Staff and students must become comfortable in a factory environment. Students must be comfortable in accepting the challenge. Our students do not understand that they must take a risk. The risk of dealing with people in a factory is foreign to many families. Most of the parents of our future leaders are totally ignorant of what industry is all about. As a result, the potential leaders do not want to work in factories. The kids from Toorak or Vaucluse do not want to work at Footscray or Bankstown.I am not here to talk about social equality or egalitarianism, but I must draw attention to this cultural gap we have in Australia that will widen unless educators at all levels do something.

If we do it and do it well, this cultural education change process will gradually be absorbed into the high schools and primary schools of Australia. It will take time, but it starts with the education of our future opinion benders. Manufacturing engineering does have something satisfying for everyone. Engineering in manufacturing is not CAD/CAM and stress analysis alone. It is more the application of well-developed, well-disciplined logic focussed on the needs and desires of people. It is the most satisfying form of engineering that can exist because when you do it well, people say "thanks", and companies become profitable. You can really feel the dynamism of the commercial process.

The principles of manufacturing engineering can be simply stated as "make the job easier", "make the environment more pleasant", "make the place a good place to earn a dollar". Even the trendiest school teacher, when he really understands and believes that the industrial capitalist is learning and trying to do these things, will recommend to all those "Mrs Worthingtons" that a working life in manufacturing industry is at least a viable option. And although I have intentionally biased my comments towards engineering for

manufacturing to make a less than subtle point, do not misinterpret my rhetoric. All disciplines are needed to join this thrust. And the lawyers and the accountants and the economists must see themselves, not in narrow professional terms, but as educated human beings searching for appropriate knowledge to meet the enormous real challenges ahead of us. Their curricula also needs to be reviewed in the light of our current challenge.

THE CHALLENGE

In meeting these challenges, we must recognise that Australia, as a medium size and currently declining world economic unit, cannot "go it alone". Those traditional hopes for Australia — "Granary" to the Empire and "Quarry" to the world, have been dashed for all time. We need new manufacturing partners who can help us with markets and technology. But the transition to a significant and competitive manufacturing base can only be achieved if there is a realisation that our cultural hubris is both unjustified and counter-productive. Neither the world nor our potential Pacific rim partners owes us a living. The time has come to get off our floating mattresses and *export* our shrimps and barbies instead of using them as props for a self-destructing national caricature.