



MONASH REPORTER

An unofficial bulletin for the information of members of Monash University

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A NEW "TREATMENT" FOR DIABETES

In the past few weeks there has been considerable publicity for a finding published from the Department of Biochemistry relating to observations made on a group of diabetic patients injected with a fragment prepared from growth hormone.



Professor J. Bornstein

As such press reports tend to imply that a sudden breakthrough has been made, I would firstly state that no new treatment exists. What does exist is a finding which has therapeutic potential. Secondly, no sudden breakthrough has been made.

The results published in the British Medical Journal are the consequence and a side line of some 20 years' research into mechanisms controlling the use of glucose and fats in mammalian tissues.

Work in this field was begun in 1948, initially in an endeavour to determine the cause of anomalies in insulin dosage observed in the treatment of diabetes. Initial work proved that a sizeable proportion of diabetics did in fact secrete insulin often in amounts greater than normal but that this was inadequate to their needs.

The clear conclusion was that some anti insulin substance was operating in such patients. Research was then switched into an endeavour to isolate and characterise this substance.

At about the same time it was shown by workers in the Argentine and England, that the injection of pituitary growth hormone into animals produced over a period of time first, insulin resistance, then temporary diabetes and finally permanent diabetes. Other workers in the U.S.A. noted that prior to the development of insulin resistance, there was a sharp fall in the blood sugar of the injected animals.

My work proceeded in England, the U.S.A. and Australia on mechanisms related to the growth hormone induced resistance and the first glimmerings arose when Dr. C.W. Baird and I were able to show that a certain method of extraction of plasma from diabetic patients yielded a very crude material which opposed the action of insulin in experimental systems and then with Dr. Margaret Sanders, Miss D. Hyde, and Dr. F.I.R. Martin we demonstrated that the presence of this material was dependent on a functional pituitary gland. Research was then switched to the pituitary and we were able to demonstrate that the material was derived from pituitary growth hormone and was of small molecular weight. Laboratory studies with partially purified insulin antagonist from growth hormone, however at times produced anomalous results. Statistical studies of these indicated that the insulin antagonist was contaminated by a similar sized molecule with diametrically opposed action. These were separated in micro quantities and studies began at Monash into two aspects of the problem.

The first was obviously into methods of preparation and purification and the second into the mechanism of action of these fractions.

Although these studies are still proceeding, sufficient data had been obtained by the beginning of 1968 to indicate clearly that the insulin antagonist operated by specifically inhibiting 3 enzymes involved in glucose use and fat synthesis and by virtue of these actions indirectly stimulated the use of fat. The other fraction (code named ACG) reversed these four actions by competitive action on the 3 enzymes involved.

Study of the model systems thus derived enabled a hypothesis as to the cause of diabetes mellitus in the presence of insulin to be made.

In order to test this hypothesis, a group of volunteer patients, all known to be capable of secreting insulin were injected with ACG and their blood sugar levels followed. In all cases there was a highly significant fall in blood sugar, thus suggesting that the hypothesis was tenable and bringing up the possibility of a new method of treatment of a condition affecting over 2% of any high living standard community.

From this point research has to follow two lines. Firstly we will continue to investigate the systems involved in these actions, to elucidate completely the structure of the two polypeptides and to synthesize them.

Secondly, an investigation into the possible role of ACG in the treatment of diabetes mellitus has already commenced in association with the Alfred Hospital's Metabolic Unit headed by Dr. H. P. Taft. It must be realised that at this time we do not even know the correct dosage of ACG, the time relations of administration or indeed whether it has any advantages over orthodox methods of treatment.

Such an investigation is necessarily prolonged

and its cost on a scale capable of yielding results in a reasonable period of time - far beyond the resources of the University or our hospitals. Thus the scale of the undertaking is beyond our control.

In conclusion, I would like to thank all members of the research group, notably Dr. Armstrong, Dr. Ng, Dr. Taft, Dr. Gould, Professor M.E. Krahl, Mrs. L.B. Marshall and our graduate scholars, for their contributions in taking the problem to this point.

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TRY A STOPOVER IN DARWIN

Mr. N. Manitius, Tutor Organiser at the Adult Education Centre in Darwin, would like to hear from any member of staff interested in giving a public lecture in Darwin under the auspices of the Centre.

Staff going overseas by air could stop off at Darwin either on their outward or inward journey.

The Centre would be prepared to pay overnight accommodation and also a lecture fee. Anyone interested should write directly to Mr. Manitius, Box 443, P.O., Darwin 5794.

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"THE FACULTY AS ENEMY"

The Vice-Chancellor, Dr. Matheson, is on a tour of North American universities. In the following article he reports on the campuses of the University of California :



Berkeley University

The nine campuses of the University of California would each, in a different setting, count as a separate university (except perhaps San Francisco which is restricted to the Medical sciences).

Three campuses - Los Angeles, Berkeley and Davis - are regarded as being fully developed and efforts are being made to hold them at their present size of more than 27,000 students; three more - at San Diego, Santa Cruz and Irvine - are quite

new but are growing rapidly towards the "norm" of 17,500 students each; the remaining campuses at Riverside and Santa Barbara are in process of development from a more limited role to that of a full-size campus.

The University is ultimately governed by the Regents, each of whom, apart from a small number of ex-officio members, is appointed by the Governor of California for a term of 16 years. This long term of office was fixed to protect the Regents as a whole from political interference, but there is now talk of reducing the term to 8 years.

Each campus enjoys a good deal of autonomy under its own Chancellor, although it has to subscribe to the broad policy of the Regents as interpreted by the President of the University, Dr. Charles Hitch.

At the time of my visit to California there was an acute crisis over the method of appointment of faculty (i.e. academic staff). Three years or so ago the Regents, recognising the need to streamline the administration of this vast organisation, had agreed to delegate the authority to make appointments to the Chancellor of each individual campus.

However, following the controversy over the reappointment of Professor Marcuse to San Diego, one of the Regents moved an amendment to the procedural rules which would remove this power from the Chancellors and restore it to the Regents.

While this amendment may not, in the end, be approved, the mere fact of its being put forward illustrates the dissatisfaction of the Regents, and indeed of the public generally, with the apparent acquiescence of the University and campus administrations in the present student situation which, it is believed by many is greatly exacer-

bated by a far too "politically-minded" staff. Politically-minded, of course, in this context means left wing.

The Governor of California, Mr. Ronald Reagan, is a Regent ex-officio and it goes without saying that he is anything but left wing. Indeed he was elected and re-elected on a platform which included increased control of the University by the Regents and he is using his power to appoint new Regents to put on men who are sympathetic to his outlook.

He is on very strong ground in doing this since recent Gallup polls have shown that he enjoys far greater public support than any previous governor at the same stage in his term of office. The University budget, too, has been firmly controlled and there is currently an acute financial crisis on all the campuses.

While all this springs from the public reaction to current university conflicts - the so-called "backlash" - and is understandable enough, it adds very greatly to the difficulties of the President and his colleagues who are no less unhappy than anyone else about student and some faculty behaviour but who want to preserve as much as they can of the old liberal university tradition. It is, of course, impossible to be firm enough to satisfy the Regents, tolerant enough to satisfy the faculty and submissive enough to satisfy the insurgents.

It was against this background that the annual All-University Faculty Conference was held this year on the subject of "The Urban Crisis". Some ten or a dozen persons attended from each campus, including, for the first time, a few students. President Hitch was there and some of his colleagues from the central administration.

The thesis to be discussed was that the University had not done enough to discharge its responsibilities to its urban clientele of disadvantaged persons: negroes, Mexican-Americans, Asian-Americans and - a rather forgotten last group - poor whites; that as coloured persons were conspicuously under-represented on the faculty and student body, special steps, perhaps involving some lowering of admission standards, would have to be taken to correct this situation; and that the neglect of these coloured people by the University was a prime cause of, or at least a prime focus for, student discontent.

(Perhaps I should interpolate here the observation that one person argued strongly with me his belief that black student radicals and white student radicals were quite differently motivated and were really opposed to one another. The former wanted desperately to improve their educational standing, to get into the University, to qualify for better jobs, to get more for their taxes than the right to be miseducated. The latter increasingly seem to reject the university as a mere agent of the "capitalist-imperialist conspiracy" and to seek to destroy it.)

It would not be appropriate now to attempt to summarise all the speeches and discussions of the conference, but I will just comment that only one speaker really rejected the thesis I have just outlined.

He argued that the University's sole responsibility was to protect and advance what he called "the higher learning"; it had no duty whatever to assume responsibilities in the urban or any other crisis for, if it did, it could only do so at the expense of its proper work.

Several students spoke in circumstances that

I didn't think entirely fair to them for they were invited to respond more or less impromptu and to a very senior audience, to addresses that had obviously been very carefully prepared. Nevertheless they did very well and, for the most part, were articulate, intelligent and very sincere; they were also very well-informed on the inner workings of universities.

One young man was to my mind quite outstanding. His subject, he announced with something of an apology, was "the faculty as Enemy" and he began by pointing out that the only power students have is the power to disrupt. (The pressure for student membership of university governing bodies seems to be much less powerful and successful in California than in Canada).

He went on to say, however, that those students who expressed their discontent by disruptive tactics were mistaken when they directed their protest at Regents and administrators; it was the faculty which was the real enemy.

His argument was that faculty members, pre-occupied as they were with analysis and description, made little attempt to cross inter-disciplinary boundaries or to become involved in the sort of community educational programmes that the conference was concerned with; that they were too concerned with research and publication to pay much attention to the development of valid ethnic studies programmes; and that they were apathetic to the importance of raising the proportion of minority group students to the 4% of the student population which justice required.

Finally, he was resentful that those students who did participate in social welfare activities did not get academic credit for so doing.

Generalisations of this kind, of course, are suspect at any time, but they struck me as being especially out of place at a conference where many faculty members had demonstrated that they were indeed concerned with the community and the University's place in it. Perhaps the speech was really directed at those faculty members who were not present.

By a coincidence I came across an article on this very subject by McGeorge Bundy* in "The Atlantic" soon after leaving Riverside. He wrote: "Too many professors in too many of our universities - even some of the very best - have done just that (neglect their own final responsibility) in recent years. Having secured their own academic freedom - and here the record of most institutions is very good indeed - the faculties have tended to assume that the internal strength and health of their universities were self-sustaining, and their government a matter of little moment. They have thus left the field open both for insensitive administrators and for student agitators."

He then goes on to argue that to the extent that faculty members have abdicated their responsibilities they have done so because they really play an unimportant part in the system.

Here, I think, when he speaks of the power of trustees and administrators and the comparative impotence of academics he is describing the American scene, not the Australian. When he remarks that "...militant students are right when they make the administration their target", he is taking the opposite view from the young Californian.

* A political scientist, who was Dean of Arts and Sciences at Harvard before joining the White House staff of Presidents Kennedy and Johnson.

But when he writes as follows I cry Amen.

"Trustees give time and money and advice and external support of all sorts; students spend some years here. But for members of the faculty the university is life itself. This central commitment is what justifies their central role, and in their effective relations with the presidency is the centre of the politics of the modern university."

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HARVARD FELLOWSHIP FOR ECONOMICS GRADUATE

Mr. George Pappas, a 1968 Monash Economics graduate, has been awarded a Frank Knox Memorial Fellowship at Harvard University.

The Fellowship is one of two to enable students from Australia to spend the 1969/70 academic year at Harvard University.

After completing his degree at Monash, Mr. Pappas became Associate to Mr. Justice Kirby, President of the Commonwealth Conciliation and Arbitration Commission.

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WHITHER MATRICULATION?

Professor L. Bodi, of the German Section, who was Chairman of the panel of Matriculation examiners of German in 1968, has called for changes in the examination system.



Professor L. Bodi

He says he is increasingly convinced of the need to withdraw from the administration of secondary school examinations because it is no longer the task of a modern university to run the school system in the way it is done in our State.

Professor Bodi has set down his views in a letter which he has sent to the Vice-Chancellors of the three Victorian Universities and to the VUSEB.

The letter is published here because it is felt that members of Monash University should have an opportunity to discuss Professor Bodi's views.

1. After long discussions with interested colleagues, I have decided to give you my views on the question of Matriculation examinations in Victoria. I have been Chairman of the panel of ex-

aminers of German in 1968 and was in charge of the examination of 499 candidates.

I am convinced that our examination panel did its best to reach a fair assessment of students. Its activities were reasonably well in keeping with the suggestions set out in the report on Examining for University Entrance in Australia: Current Practices by B. Rechter and N.L. Wilson (Dec. 1968; to be quoted as A.C.E.R. Report). I must say, however, that I am nevertheless unhappy with the whole practice of matriculation examining in Victoria.

2. As a result of our work, it was possible to put students roughly in order of merit. Considerable time was spent on checking all discrepancies; this was made relatively easy by the fact that quite a number of skills are being tested in the course of the German matriculation examination. It was inevitable in many cases that the panel should look at the information that could be gathered through the remarks of the oral examiners who had been in personal touch with the individual students.

By far the greatest difficulty was encountered in the marking of the essay paper which counted for a third of the total mark. Although a marking system had previously been worked out, very great discrepancies occurred in assessing this paper. On the basis of this experience I cannot imagine how students can be fairly assessed on the basis of essay type papers only as, I understand, is the case in quite a few subjects.

3. The standardization procedure certainly helps to abolish differences between subjects and might assist in developing some kind of common denominator, but it does not change the fact that in the end the student has to be given some kind of an absolute (be it raw or stand-

ardized) assessment on which his whole future life may depend, for his university entrance and the awarding of a Commonwealth Scholarship may well be decided on the basis of a difference of one mark only. I am fully in agreement with writers of the A.C.E.R. Report who emphasize that the moral responsibility of the examination panels within a procedure of this kind is much greater than is normally expected of decision making bodies at this level.

When thinking about how to improve procedures, the first thing that comes to my mind is to introduce as the best possible safeguard against misjudgements an assessment by the body which is bound to know the work of the student best in the individual subject; I am thinking of the assessment of his school and his subject teacher. I think it is criminal to disregard the considered opinion of the school and to put the whole future of the student on the one card of the public examination. I believe that in this respect the A.C.E.R. Report does not go far enough as it assumes that a reform of public examination procedures alone will eliminate the main faults of the system. It is quite clear to me that the following procedure could well be implemented:

- 4.1. There should be assessments by schools of each candidate based on a report by the subject teacher summarizing the progress of the student in the individual subject over a number of years. This assessment, either in the form of reports or in that of standardized marks, should be before the panel of examiners.
- 4.2. The marks achieved in the public examination should in some way be collated with the marks given by the schools. In

the case of marked discrepancies, the papers would have to be remarked or students would have to be given an opportunity of passing supplementary (oral?) examinations.

5. For this kind of marking a more complex and modern machinery would be needed than the present one. Undoubtedly it is of very great value if university teachers have a good knowledge of what happens in high schools and are able to influence secondary school curricula, but for many reasons modern public examinations have by now ceased to be the responsibility of the universities.

- 5.1. The A.C.E.R. Report still sees the problem as one of examining for "university entrance". This obviously is not really the case any more. The introduction of quotas has ceased to make our matriculation a university entrance examination and for a larger percentage of the school population matriculation is tending to become more and more a terminal exam.

In my own subject 499 students sat for matriculation this year and 126 students have enrolled for first year subjects assuming matriculation in German at Melbourne and Monash Universities. On the whole the number of matriculants in Victoria in 1967 was 12,898, of whom 8,628 passed the whole examination and only 5,000 started university courses. A large number of students also sat for one or two subjects. Considering that less than 40% of matriculants have entered university in 1967, it might well be necessary to re-consider the function and role of universities in conducting matriculation examinations.

- 5.2. The last decade has seen a process of high-

est specialization and professionalization in both universities and secondary schools. As set out in great detail in the A.C.E.R. Report, university teachers are not necessarily familiar with rapidly changing modern school teaching methods, modern principles of testing and measurement, etc.

- 5.3. In the development of Australian universities in the post-Murray Report era, the needs of research have gained increasing importance. As the long vacation is for most academics the only time of the year for intensive and sustained research work, there is a marked and understandable reluctance among our colleagues to become involved in matriculation matters. The timing of the examinations is catastrophic for university staff. It comes after the extremely difficult period of university examinations, student advising, etc; with the increasing complexity of the modern university, all this poses strenuous enough tasks even without taking over the complete load and responsibility of matriculation examining in Victoria.
- 5.4. I do not by any means want to say that the universities have no responsibilities towards the educational system of our state. I do believe, however, that the responsibility of the university is not to bear the load of public examinations, but that of advising and helping the school system by organizing refresher schools and courses for teachers at all levels and by looking after the crucial task of keeping teachers up to date professionally with all relevant modern developments in their subjects.
6. As far as I can assess, the appropriate body to

take over the responsibility for the running and organization of a new examination system is the Victorian Universities and Schools Examination Board. This is an independent body at which all secondary and tertiary educational interests of all types of schools, universities and colleges are represented. It is eminently suited to take over a new role in the running of examinations. Universities and individual university departments can well exercise their influence within the framework of the Board.

- 6.1. In order to professionalize the running of our examinations, it is imperative that the V.U.S.E.B. appoint its own independent professional staff. I am thinking of trained educationalists who could well act as inspectors and advisers during the year and who could run the examinations at the end of the school period. Considering that the budget for examining in German alone was a sum of \$3,300, it may be argued that a sum of this size could well be used towards employing an independent inspector-examiner for German alone.
- 6.2. The V.U.S.E.B. could well enlist the help of outsiders if needed who by no means have to be academics with little knowledge of secondary school matters; school teachers, lecturers at Secondary Teachers Colleges and Method Lecturers in Faculties of Education at Universities might be useful members on panels of examiners.
7. I think it is high time to change a system which pleases no-one, is equally unsatisfactory for universities and schools, subject teachers and university departments and might well be the source of gross error and unfairness affecting thousands of students - which is, in one word detrimental to the interests of the whole society. The sooner a radical reform is started, the better.

HOW MUCH TERTIARY EDUCATION CAN WE AFFORD?

The following is the text of a talk given recently to the Melbourne Legacy Club by Dr. P.G. Law, Vice-President of the Victoria Institute of Colleges:

Victoria is facing an educational crisis of major dimensions in the tertiary area. A rapidly increasing demand for advanced education together with escalating costs for scientific and technological training have produced a situation where one must ask, "Can Victoria afford a system of education in which provision is made for tertiary level opportunities for all students with the ability and the desire to proceed with advanced education?"

The cost of such a system will be frighteningly high and at a completely different level from that which we have previously faced.

Until very recently we have taken it for granted that we have a national obligation to provide tertiary education for all capable of profiting from it. That has been because economic and other factors have limited the numbers presenting for such education to a total that the State could handle.

Now, with quotas already limiting entry to the universities and a rapidly growing demand for places in colleges of advanced education, a point has been reached where the Government of Victoria

must face the fundamental question: "Can we afford to provide for all the qualified students clamouring for entrance, or do we draw a line at the level that we can afford and, as a result, stiffen up competition for a limited number of vacancies?"

Let us examine the situation in detail. There are three causes for the financial crisis that is impending in tertiary education:

1. the rapid increase in the number of students demanding enrolment;
2. the increase in the complexity and quality of education needed;
3. the resulting pressures on the systems of teacher training.

Let us look at each separately.

1. The rapid increase in the number of students.

- (a) The high birthrate of the immediate post-war years produced a surge of students which, having embarrassed our educational system first at the primary and then at the secondary level, has now swept on to produce a problem at the tertiary level. We have recently taken out the following statistics:

In 1968 the total number of full-time students enrolled in Victoria at the tertiary level was 26,000. Of these, 9,000 were at colleges of advanced education and 17,000 at universities.

By 1972 the universities' enrolments are expected to reach 26,000 full-time. Our colleges have estimated that their full-time enrolments by 1972 will be 15,000. However, my

research officer has taken out figures based upon population statistics and present trends in student enrolments and he gives a probable figure of 18,700 full-time students for 1972 in colleges of advanced education.

If we accept his prediction, the total full-time tertiary student demand in 1972 will be about 45,000 compared with 26,000 last year. If part-time students are considered and converted into full time equivalents, the figure will be still higher. This is a staggering rate of growth. But there is another factor that might increase the demand still further.

- (b) It is becoming abundantly clear that in the highly industrialised society of tomorrow the best career prospects will be reserved for those with the best training. Most parents have therefore become aware of the need to encourage their children to acquire the highest qualifications of which they are capable. We have become accustomed to this trend amongst middle-class families over the last ten years, but now a new socialological phenomenon has arisen -- the educational demands of parents from the lower income levels. Ten years ago intermediate certificate was the pinnacle of the educational aspirations of most such parents for their children. Today they have their sights levelled at tertiary education, and a more liberal scholarship system is helping their children to achieve this objective. It can be expected that student enrolments at tertiary institutions will rise rapidly as a result of application from industrial suburbs north of the Yarra, suburbs which previously have supplied only a small trickle of students.

2. The increase in the complexity of education

- (a) Industrial development and technological progress are producing increasing demands on the tertiary educational system. Specialist

scientific and technological courses are proliferating. All sorts of subjects are being taught today that were not listed in the curriculum ten years ago. And the subjects that were listed have become considerably more complex.

- (b) Such courses are requiring increasingly complex and expensive equipment. Items such as analogue computers, gas chromatographs, infra-red and ultra-violet spectrophotometers, mass spectrographs, electron microscopes, nuclear magnetic resonance spectrometers, atomic absorption spectrometers, were no more than exotic research aids ten years ago. Now no tertiary technological educational establishment can afford to be without them.
 - (c) A modern library is totally different from its counterpart of a decade ago. The explosion of knowledge and the growing use of tape recordings, slides, microfilms and other forms of readily accessible recorded information have greatly increased the cost -- as well as the effectiveness -- of the modern library.
3. Pressures on the systems of teacher training.

As a direct result of what I have said, there is a rapidly increasing demand for trained lecturers and teachers capable of handling the complex new knowledge being produced by scientific research and technological and industrial progress.

Trained academic staff arise from two main sources. First, they are turned out from teachers' colleges (which are having to raise their standards and lengthen their courses to cope with present developments). Secondly, they emerge from the graduate

courses and the postgraduate research schools of universities and colleges of advanced education.

There is thus an ascending spiral of demand -- more students demand more teachers and to produce more teachers one must enlist more students who can graduate to become teachers. In the long run nothing will limit the expansion of tertiary education more than a shortage of trained academic staff.

Without mentioning some obvious inadequacies in our primary and secondary systems of education, I think I have made it clear that at the tertiary level the demands are mounting at a frightening rate.

But what is the order of magnitude of the costs involved? For the present triennium, 1967-69, the Victorian Universities have been provided with a total of \$126 million and the colleges of advanced education with \$46 million. These figures cover both capital and recurrent expenditure.

For the next triennium we estimate that the colleges of advanced education will need \$148 million -- more than three times the finance made available last triennium. The estimated needs of the universities will be about \$230 million, almost twice what they got previously. It is already clear that the Governments concerned are dismayed at this level of requirement.

The next obvious question to ask is: "Can we afford to provide funds for education at the order of magnitude required?" I should like to turn this question around and ask, "Can we afford not to?"

"Victoria is on the verge of a golden era", said Sir Henry Bolte at a recent press conference. "There will be development on development. There could be literally hundreds of millions of dollars worth of plants, which could run on gas and oil products, planned but not yet let for tender." (Report of Press Conference 21/11/68.)

This is true. The potential development in Victoria is immense. But actual development -- the realisation of the dream -- depends upon an adequate supply of people educated and trained for the complex tasks involved in running a highly industrialised society.

Every new advance increases the demand for technologists and technicians, managers and administrators, teachers and research staff. The big question today is whether we are adequately "tooled up" for a production line that ten years from now will pour out the trained people that our transformed technological society will need.

There are only two alternatives: we can try to keep pace with the advanced industrialised countries and look forward to increasing affluence and prosperity; or we can fall behind in the technological race, watch our standards of living decline and see the control of our country and its industries pass into the hands of overseas interests.

It is no longer sufficient in this race to be technically competent -- a country must have the capacity for technological innovation. It is the new idea, the new design, the new development that produces the profit today. Competition by innovation is rapidly taking the place of competition by production. It is no use producing huge numbers of vehicles of a model that is out of date! And masses of workers with inadequate training are

more an industrial handicap than anything else.

Sophisticated levels in science and technology are required to spearhead research and development, then competent techniques of management and organization are needed to take advantage of the potential for innovation thus developed.

The industrial effectiveness of a nation depends more upon its capacity to draw upon the existing body of basic scientific knowledge, wherever it may have been generated, than upon its capacity to contribute to this body of knowledge. However, a nation can only draw upon such knowledge if it has competent scientists and technologists. A capacity for innovation is essential in order to profit from the innovations of others! At the present time no nation can encompass all the fields of technological progress. Each must assimilate the progress made by others and use it as a stepping stone to pass in its turn through new stages.

However, heavy reliance upon foreign innovation is undesirable. First, it is expensive and reduces the profitability of local companies, which have to pay royalties for foreign patents. Secondly, it inhibits local development because local technologists do not develop their own competence. Thirdly, it prevents a country from ever being up-to-date and competing at a serious level, for its products are always at least three years behind the leaders.

The first requirement for successful innovation is education. A system that can provide education beyond 18 years for a large proportion of the young and also retrain a growing number of adults is essential for a modern industrialised country.

U.S.A. is the giant of all the industrialised

nations. With 7 per cent of the surface of the globe and 6 per cent of its population, U.S.A. produces goods equal to one third of the total production of all other countries in the world. High educational levels and capacity for research make this supremacy possible. In 1966, 43 per cent of the population in the age group 20-24 years in the U.S.A. was at college or university. (Compare USSR 24%, Canada 22.5%, France 16%, Japan 13.5%, Sweden 11%, Britain 5%, and Australia 3%.) In 1965, the U.S.A. devoted 3.6 per cent of its gross national product to research and development, as against W. Europe's average of 2 per cent. (Australian figures are not available.)

If Australia is to compete with other highly industrialised countries on world markets, she must extend advanced education, develop science and technology to increase her capacity for innovation, and improve her techniques for management and organisation.

The Victoria Institute of Colleges is a system of educational institutions that occupies a unique position in relation to these requirements. It has the potential to handle growing numbers of tertiary technological students, to build up applied research, to train industrial designers and to produce graduates in business studies, administration and management.

But whether this potential can be developed in time to provide for the increasingly urgent demands of Victoria's rapidly expanding industrial system depends upon the rapid development of an adequate educational "production line". There is much to be done, first, to remedy the deficiencies that exist in a number of colleges: crowded buildings, lack of equipment, poor libraries, inadequate administrative staffs, and almost non-existent student amenities.

Then there are the problems -- philosophical, academic and material -- that must be faced in developing the existing system. New diploma courses must be designed to satisfy new and evolving demands of industry and commerce, degree courses must be built up and areas of industrial and applied research developed. Staff must be given opportunities to study for higher degrees and the colleges must develop their capacities for producing their own academics instead of having to rely so heavily on the products of the universities. Regional colleges must be built with residential facilities, to provide for country students.

The colleges at present affiliated with the V.I.C. are:

Institutes of Technology: Ballarat, Bendigo, Caulfield, Footscray, Geelong, Prahran, Preston, Royal Melbourne, Swinburne, Yallourn.

Therapy Schools : Victorian School of Speech Therapy, Physiotherapy School of Victoria, Occupational Therapy School of Victoria.

Pharmacy : Victorian College of Pharmacy.

Non-affiliated colleges that are considered to qualify for Commonwealth financial support as colleges of advanced education are:

The agriculture colleges at Dookie and Longerenong. The Burnley Horticultural College. The Emily Macpherson School of Domestic Economy. The Creswick Forestry School. The Australian College of Nursing. The Warrnambool Technical College.

The Institutes of Technology play a special

role in the tertiary system of Victorian education. They provide a wide range of professional and vocational courses, covering such diverse fields as various types of engineering, mining, applied chemistry, metallurgy, architecture and building, instrument technology, biochemistry, food technology, surveying, photography, industrial arts, graphic design, business studies, management, librarianship, television and film design, electronic data processing, computer science, fashion design, medical laboratory technology, etc. Opportunities are provided for part-time students, while refresher courses in professional subjects and retraining programmes for adults are being developed.

Earlier in this talk I quoted figures showing an expected increase in student full-time enrolments from 9000 in 1968 to 18,700 in 1972. This remarkable expansion presupposes that facilities and staff will be enlarged to cope with the numbers involved. If adequate finance is not made available for this purpose, Victorian parents will face the prospect of quotas in these colleges as well as in the universities. The community must then ask itself whether, in a period of unprecedented industrial expansion, it can afford not to train at tertiary level all the students who successfully emerge from the secondary school system and desire to proceed to further education.

Roughly 15% of the population has the mental capacity to proceed to a tertiary level of education but out of these many have not the motivation or the application. Those who have both the capacity and the desire for advanced education therefore form a small minority of the total population. These are the people to whom the nation must look in the future for its leaders in most fields of endeavour. Can Australia afford to deny any of these the opportunity for a tertiary

education? And what will be the attitude of parents who, having made all kinds of sacrifices for their brightest children, see them excluded by quotas from the higher education to which they have aspired?

Where is the money to come from? There would appear to be only three major sources: National priorities can be altered to give education a higher place in the scale of demands; increased revenue can be raised by taxation or other means; or the nation can mortgage its future to build up the educational resources upon which this future is completely dependent.

The reply of a Government faced with the above questions is generally, "Look at what we are at present spending on education", or "Education at present accounts for 40% of our budget; we can't go any higher". The simple answer is that the U.S.A. spends on education 8% of its gross national product and Japan 7%. Australia spends only 4%, of which 3.3% is government money.

There is a strong argument in a country like Australia for going deep into the red to finance educational development. There is an assured future ahead of us; our remarkable mineral resources, our developing oil fields and our growing industrial strength all promise high dividends ten years from now. Yet development ten years from now will be crippled if trained manpower is not available for the expanding technological requirements. In the next ten years we have to build a vast tertiary educational structure at great expense. Future generations will gain most of the benefit -- why should they not bear more of the cost?

Education is like a factory production line: it takes some years to "tool up" before products begin to stream off the end. It will be too late

to build a production line if we wait until our oil and mineral dividends begin to flow.

It would be of considerable assistance to educational planners if the users were to make a careful study now of what they estimate their requirements for various types of technological manpower will be in ten years' time. If industrial corporations, commercial organisations, the professional institutes and others interested in national technological development were to produce such figures, I predict that they would disclose a degree of urgency for the development of technological training that has so far not been appreciated.

Plaguing the whole question of finance for education is the relationship between the Commonwealth and the States. It is clear that the States, under present arrangements, cannot meet the steeply escalating costs of their educational requirements. Education costs the States six times what it costs the Commonwealth!

I believe that there are two fundamentals for national existence -- health and education. Everything else -- primary and secondary industry, defence, transport, power, housing, police, harbours, etc. -- depends upon the quality of these two.

However, the States are suffering from acute malnutrition throughout the whole spectrum of education -- pre-school, primary, secondary and tertiary.

At present the Commonwealth is injecting funds into various areas to help the States -- money for universities, for colleges of advanced education, for technical schools, for teachers' colleges, for libraries. Such assistance has been invaluable but the mere fact that the State educ-

ational systems could not function without such help shows that there is something radically wrong with the basic method of financing the States.

On a broad scale, I would personally advocate a redistribution of national resources so that the fraction of our gross national product that is made available for education could be increased.

Finally, let me clean up the confusion that exists in the minds of many people concerning the role of the Commonwealth in education. These people, seeing the inadequacy of the State educational systems, say: "The Commonwealth should take over education".

Why should the Commonwealth take over? The States are quite competent to run education. Education is best administered by a decentralised system, and such a system exists in the States and is working. There is nothing wrong with the system -- all it needs is more money! Let the Commonwealth provide the money and let the States get on with the job that they are well equipped to do.

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AUSTRALIAN INSTITUTE OF MANAGEMENT

Mr. Stafford Needham will give a talk on "Clerical Training" at the Australian Institute of Management, 31 Queens Road, between 6.00 p.m. and 8.00 p.m. on Tuesday, June 17.

Anyone interested in attending should telephone Miss M. Elms, Extension 608, University of Melbourne.

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WE HAVE TAKEN THE LIBERTY . . .

The University of Melbourne is reported to be considering a \$60 annual levy on staff and personnel allowed to park in the university grounds.

The President of the Melbourne University Staff Association, Dr. A. A. Grant, has commented that the staff will ask the University Council to request a car park allocation from the Australian Universities Commission.

"I think most of us would be prepared to pay a \$10 fee" he is reported to have said. "But \$60 is a substantial fee."

Melbourne has had its parking problems for some time.

The following letter, sent to the Chancellor of Melbourne University by a group of students, was dated March 10, 1856 :

Sir,

The kindness which you have hitherto so frequently displayed towards us emboldens us further to trespass on your consideration. The request with which we beg now to trouble you, is one which we think you will admit to be reasonable.

We have long found it inconvenient on riding to the University, to be under the necessity of leaving our horses in insecure or distant stables. Our present application is intended to obviate this: and we are under the impression that with

little trouble and at a small expense sufficient accommodation could be afforded.

Feeling quite assured that you will assist us in this difficulty, we have taken the liberty of addressing you.

If you will take the matter into your consideration we shall feel under great obligations to you.

We have the honour to be,

Sir,

Your most obedient Servants . . .

The request was disallowed.



Melbourne University Staff News came up with this possible solution for their parking problems

SPANISH TRAGEDY

From July 9 - 12 Federico Gascia Lorca's "Blood Wedding" will be presented in the Alexander Theatre.

Lorca based the play on a newspaper story of the tragic sequel to a wedding in a peasant community of Southern Spain. The marriage unites and apparently reconciles two families with a previous history of blood feud between them.

The play works from the simple betrothal of bride and groom, through the wedding day with the bride's early morning procession to church, to the wedding feast in the evening, when in the midst of the celebration suddenly the bride cannot be found. She has disappeared with her former sweetheart of the rival family.

In the 'hunt' scene that follows, the incensed bridegroom pursues the couple into a forest, when the wedding ends in tragedy - only the women are left to mourn.

Lorca is beginning to receive long overdue attention among Melbourne audiences as a most powerful playwright who can work between naturalism, delicate poetry and fierce flights of the imagination without incongruity. This production will be the third Lorca play to be seen at Monash in the past 2 years.

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LUNCH-HOUR CONCERTS

The Monday lunch-hour concert series are held in the Alexander Theatre, 1.10 - 2.00 p.m. each Monday during terms (admission free).

2nd Term Series

- June 9 Keith Humble presents Nunique IV.
- June 16 Paul McDermott Quartet Programme includes the Walton String Quartet.
- June 23 Anna Nagel (soprano), Murray Mardardy (baritone), Kathleen Brady (piano) Schemann: "Woman's life and love" Cycle; Mahler: Songs of a wayfarer; Duets.
- June 30 Programme by student performers; with Laughton Harris (viola): Helen Cortis, Cathy Falk (violins) Gerald Keuneman (cello), Leslie Howard (piano) Shostakovich: Piano Quintet op. 57.
- July 7 Californian Youth Orchestra (U.S.A.): Programme to be announced.
- July 14 Melbourne Wind Ensemble, directed by Paul McDermott. Programme includes Stravinsky: Octet.
- July 21 Kathleen Brady (piano) Bach: Preludes and Fugues in E Major and A flat Major (from Bk, II of the "Well-tempered Clavichord"); Fauré: Theme and Variations, op. 73; Debussy: 'Cloche à Travers les Feuilles' and 'Mouvements' (Images).
- July 28 Monash University Chamber Orchestra, conductor Laughton Harris. Programme includes Bach: Brandenburg Concerto No 4.

August 4 Monash University Choral Society, conductor John McCaughey, and Student Performers studying under the Monash Union's Music Teaching Scheme. Programme includes piano, guitar, clarinet and vocal solos, and choral works.

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BOOKS FOR SALE

The Monash representative on the Women of the University Fund has the following books for sale in aid of the Fund's charities. They are all in good condition, with hard covers, and anyone interested should telephone Netta McLaren at 25.3424.

Bean, C.E.W.	The Dreadnought of the Darling. Pub. Alston Rivers 1911. Illus.	\$2.00
Lever, Chas	The Confessions of Harry Lorrequer Pub. Macmillan 1905. Illus by "Phiz".	\$2.00
Vindex	Cecil Rhodes, His Political Life & Speeches 1881-1900. Pub. G. Bell 1900	\$2.00
Hazlitt, Wm.	Shakespeare, Supplementary Works comprising his poems & doubtful plays, with glossarial and other notes. Pub. Routledge 1852.	\$2.00
Bench & Bar,	by the author of Random recollections of the Lords & Commons. Vol. I. Pub. H.Colburn 1837.	\$2.00
Bros. Grimm	Household Stories. Trans. from German by Lucy Crane and done into pictures by Walter Crane. Pub. 1882.	\$1.50
Hamerton, P.G.	The Sylvan Year. Leaves from the Notebook of Raoul Dubois. Illus. Pub. 1876.	\$1.00

SPORTS CENTRE PUBLISHES BOOKLET

A booklet on the emergency treatment of sports injuries has been produced by the Committee of the Monash Sports Medicine Centre. It illustrates the value of the interdisciplinary approach to sports medicine.

The booklet was produced for the Sports Association by the members of the Sports Medicine Centre in order to meet a community need. With the aid of a grant of \$1500 from the Rothmans National Sport Foundation to cover the cost of publication about 20,000 copies have been printed. These are being distributed free throughout the Commonwealth.

It is hoped that the booklet will provide simple practical information for anyone who may be asked to give first aid for sporting injuries, when trained medical or first aid people are not present.

Mr. A.H. Toyne, the secretary of the Australian Sports-Medicine Association, said: "The booklet's main value is that it shows untrained people how to give expert first aid."

Anyone wanting a copy of the booklet should contact the Sports Association (Extension 3103).

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THE REPORTER

Copy for the June issue will close on June 6, and for the July issue on July 4. Copy should be addressed to the Editor, Monash Reporter, Vice-Chancellor's office.

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MONASH DOCTOR SHARES INTERNATIONAL PRIZE

The man who was awarded Monash's first Doctorate of Medicine has shared an international prize for psychiatrists.

He is Dr. Frederick Hocking, who received his Monash Doctorate last year for a thesis on human reactions to extreme environmental stress.

The thesis traced the case histories of 312 former inmates of Nazi concentration camps.

The award is the Gutheil - von Domarus prize sponsored by the American Association for the Advancement of Psycho-Therapy. Dr. Hocking shared it with Professor H. Garner, Professor of Psychiatry at the University of Chicago. There were more than 200 entries from around the world.

The prize, which was awarded this year for the first time, is for the most outstanding original work dealing with any aspect of psychiatry.

Dr. Hocking's entry was based on his Monash thesis.

Dr. Hocking is continuing his link with Monash. He is working with Professor Basil Hetzel, Foundation Professor of Social and Preventive Medicine at the Alfred Hospital.

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PROFESSOR HANDS OVER ROYALTIES AS PRIZES

Professor J. M. Swan, Professor of Organic Chemistry, has donated \$40 to the funds of the University to be used in the following way: \$10 prize for the best article published by a first year medical student in the magazine "Karyon": two \$10 prizes for the best two articles written by first year science students and published in the magazine "Exordia", and a \$10 prize for the best article published in the same or similar magazine by a first year student of engineering.

Professor Swan's donation of \$40 is the amount of royalties he anticipates from sales at Monash of a book he has co-authored.

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ALEXANDER THEATRE

"KISS ME KATE" - Monash University Light Opera Co.

Advance notice of the 1969 production by the Monash University Light Opera Company (M.U.L.O.C.) of Cole Porter's popular "KISS ME KATE" - a lively musical with such memorable hit tunes as "Wunderbar", "So in Love", "I Hate Men", "Why Can't You Behave", "Brush up your Shakespeare", etc...

The season runs from Friday, June 20 to Saturday, June 28, so remember to keep these dates free if you are fond of a good musical.

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SCHOLARSHIPS & FELLOWSHIPS

American Studies Fellowship Program

The American Council of Learned Societies has announced a competition for American Studies Fellowships, to be initiated in 1970 and available to scholars of Australia, the Republic of China, Japan and New Zealand. The fellowships are for scholars of no more than 45 years of age who are teaching at the university level, and who wish to engage in advanced research in the United States on some aspect of the history, culture, or civilization of that country.

The Fellowships are for a minimum period of nine months and may be extended to a maximum period of two years, and provide for all expenses.

Scholars interested in Fellowships to be initiated during the year 1970 should write to The American Studies Program, American Council of Learned Societies, 345 East 46th Street, New York, N.Y. 10017, U.S.A. The letter, which must arrive at ACLS before July, 1969, should contain the applicant's name, address, age, university position, a brief description of the research he wishes to undertake, and the names and addresses of three scholars who would be willing to provide letters of recommendation. If the ACLS judges the candidate to be qualified to enter the competition, formal application forms will then be sent to the candidate for completion and return before August 1, 1969. Announcement of awards will be made in December, 1969.

The English-Speaking Union of the Commonwealth Fourteenth Annual Travelling Scholarship

The Younger Member's Group of the Victorian Branch of the English-Speaking Union offers, in 1969 its fourteenth annual Travelling Scholarship.

It is valued at \$500, and is open to all young men and women whose ages fall within the prescribed limits and who have made arrangements to travel to the United Kingdom or the United States of America not earlier than August 1, 1969, nor later than August 31, 1970.

Application forms may be obtained from the Grants and Scholarships Office in the University Offices building. The completed forms should be forwarded to reach the following address not later than June 30, 1969: The English-Speaking Union Younger Members' Group Scholarship Committee, 146W Toorak Road, SOUTH YARRA, VICTORIA 3141.

Finnish Government Awards

The Finnish Ministry of Education is offering specialist grants to foreign scholars for research and specialization at post-doctoral level.

They are available for a period of 4 to 8 weeks and may be taken up at any time during the year. They are valued at approximately \$AUST.217 per month in addition to other benefits.

Application forms and further information may be obtained from :

The Secretary
Department of Education and Science,
P.O. Box 826,
CANBERRA CITY, A.C.T. 2601

Applications may be lodged at any time.

The Harkness Fellowships of the Commonwealth Fund of New York
Awards from Australia - 1970

Five Fellowships in any field of study are offered each year in Australia and New Zealand. Australian candidates must be citizens of Australia or have taken steps to achieve citizenship. They should be not more than 35 years of age on September 1, 1970.

Selection of nominees to be recommended to the Fund is in the sole discretion of the Australian Nomination Committee. Candidates must be prepared to attend for interview in Melbourne during December 1969.

Further information may be obtained from the Grants and Scholarships Office, University Offices.

United States Public Health Service
International Postdoctoral Research Fellowships

Up to six awards may be made each year to Australians for training for research in "health-related" fields (broadly interpreted) in any medical or biological laboratory in the U.S.A. Each award will be made for six months to one year. Under exceptional circumstances an extension of up to twelve months may be considered.

A stipend of \$6,000 to \$7,000 is provided according to relevant post-doctoral experience. In addition, \$500 is provided for spouse and each dependant child, whether or not the dependants accompany the Fellow to the United States.

Applications close on October 1 each year with the Executive Secretary, Australian Academy of Science, Gordon Street, Canberra City. The results will be announced in the following April.

Further information may be obtained from the Grants and Scholarships Office, 1st Floor, University Offices.

DEPARTMENTAL NEWS

Botany

Mr. G.H. Yezandi had the services of our expert photographer Mrs. A. deCorona when he ventured forth to the South West of Victoria recently.

Habib and Anne took over 20 coloured photos of the various plant communities surrounding the Camperdown lakes and also the immergent vegetation and aquatic plant life. (See photo)



A stand of *Typha Augustifolia*
(Bulrush) in Cobrico Swamp

We were all very thrilled to have Mr. Jeff Swift give our first Honours Students Seminar on April 23 last. Jeff spoke very competently on "The Wheat Embryo".

Genetics

Dr. A.J. Clark, Associate Professor in Molecular Biology, University of California, Berkeley, is a Visiting Fellow in the Department from April 3 on a Guggenheim Fellowship. During his stay at Monash, Dr. Clark is writing a book on microbial genetics, and with his Research Assistant, Miss Ann Templin also from Berkeley, will continue his research on the nature of genetic recombination in bacteria. Both Dr. Clark and Miss Templin are staying at the Halls of Residence.

German

Dr. R. Gaerte, Consul General of the Federal Republic of Germany, presented the prizes to the winners in the annual Goethe Competition at a ceremony in the Staff Room on Friday, May 2. Afterwards he introduced a German film "Mahlzeiten" which was shown for the first time in Australia.

Professor Bjarne Ulvestad of the Germanic Languages Department, University of Bergen, Norway, at present guest professor in the Linguistics Department, addressed the postgraduate colloquium on German Linguistics, His topic was "The German Sentence and its Permutations".

Coming Attraction

The film "Schonzeit für Füchse" will be shown on Friday, June 13, at 7.30 p.m. in Lecture Theatre H2, Robert Menzies building.

Mechanical Engineering

Dr. S.R. Valluri

It was a pleasure to welcome Dr. Valluri, early this month, who is Director of the National Aeronautical Laboratories, India situated in Bangalore. Dr. Valluri, who was in Australia at the invitation of the Commonwealth Government as Materials Coordinator for the Commonwealth Aeronautical Research Council, not only inspected facilities of the Department, but also presented a Seminar on the work of his Laboratory, with particular emphasis on ways in which research and development can usefully interact with developing industry.

Dr. P.A.O.L. Davies

Dr. Davies is Reader at the Sound and Vibration Research Institute, Southampton and also visited the Department early in May, in his capacity as Visiting Professor in Mechanical Engineering at the University of Queensland. He, too,

spoke to an interested group on recent developments at Southampton in studies of turbulence structure, at a Geophysical Fluid Dynamic Seminar.

Mr. W.S. Widden

The Conference on 'Vibration of Machines' sponsored by the Technical Committee on Applied Mechanics of the Institution of Engineers, Australia, held May 29-30, drew together many practising engineers as well as research and development people from academic and laboratory institutions. Mr. Widden, Lecturer in Mechanical Engineering at the University of Western Australia, was one of these and took the opportunity to visit the Department.

Mr. J. Snell

Arising out of active co-operation in devising surgical instruments, the visit, early in May of Mr. Snell, who is Honorary Plastic Surgeon at the Alfred Hospital, reflected the Department's growing interest in Bioengineering. Mr. Snell outlined some problems that might yield to engineering solutions to a small group of staff, undergraduates and graduate students.

Politics

Dr. Leon Mann, who is Assistant Professor in Sociological Relations at Harvard, is arriving soon to give lectures and seminars for the Politics and Psychology Departments at Monash.

Mr. Max Teichmann's book "New Directions in Australian Foreign Policy" appeared in Penguin Books last month.

Dr. John Playford presented a paper on "Neo-Capitalism in Australia" to the Annual School of Industrial and Labor Relations, held at the Australian National University. He also gave a paper on democracy in Australia at the Left Action Con-

ference held in Sydney during Easter.

Dr. John Dalton is going to Brisbane to speak on Malaysian Foreign Policy.

Mr. David Goldsworthy has received his Ph.D. from Oxford, and Mr. Nick Allen has been granted a Canadian Commonwealth Scholarship and will be going to Canada for two years to do his Ph.D.

Mr. Charles Coppel and Mr. Rex Mortimer have both returned from field-work overseas.

Psychology

Professor R.H. Day has been invited to act as President of Section 43 ANZAAS for the 41st Annual Congress in Adelaide in August.

Dr. Stella Crossley, D.Phil. (Oxon.) has been appointed to a Lectureship in Psychology and will take up duties in May, 1969.

The Ford Motor Co. of Australia recently donated a variety of automotive parts as a contribution to a project involving motor vehicle simulation which is being conducted by Mr. A.D. Perriement.

Physics

Mr. Gordon Troup's recent monograph "Understanding Quantum Mechanics", published by Methuen (London), is to be published in German by Springer Verlag (Berlin).

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