THE ROLE OF ASIAN UNIVERSITIES IN A CHANGING WORLD

Selected papers from the International Conference of Universities, Kuala Lumpur, Malaysia, August 24 — 29, 1970.

Edited
by

K. S. NIJHAR

ACADEMIC STAFF ASSOCIATION,
UNIVERSITY OF MALAYA,
JUNE 1972.

To,

Encik Abdul Wahab Majid,

With compliments from

K S Nijlan

16/8/72

"……The duty of a university is to teach wisdom, not just trade, to mould character, and not merely to teach technicalities……"

— Y. A. B. TUN ABDUL RAZAK bin DATO HUSSEIN

In this region the University has to be a major agent of development. The University graduates, staff and students, should assist directly and indirectly in the achievement of a high rate of economic growth, and in Malaysia, particularly in the reconciliation of this growth with the need for more equitable distribution of income. The University should provide the right system for training of efficient and dedicated executives. The University should be a place for explorers and discoverers in the cultural renaissance and establishment of nationally committed creative workers.

Undergraduates need to be taught useful knowledge and practical intellectual skills. For those who desire it (and the rest are unworthy of being admitted to universities) there should be rich opportunities for relevant cultural, social, political and physical experiences that will prepare them for their destined tasks as workers in national development.

At the postgraduate level, since the nation has to depend on the University for the collection, systemisation and dissemination of fundamental knowledge from the world of learning, especially in Science and Technology, the University has a unique role as the milieu where brilliant young minds of the nation can study and discover the ideas, theories and technical innovation that will give to progress the jumping-force of Great Leaps.

(PROFESSOR UNGKU A. AZIZ)
Naib-Chanselor,
Universiti Malaya.

29th May 1972.

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PERKHIDMATAN
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OPENING ADDRESS

by

Y.A.B. Tun Haji Abdul Razak bin Dato Hussein, S.M.N.
(The Deputy Prime Minister of Malaysia and the
Director of Operations)

I am happy and honoured to be here this morning to declare open the International Conference of Universities. I would like to extend a warm welcome to all our friends from overseas and to wish every delegate a pleasant and memorable stay in Malaysia.

We in Malaysia are happy and proud that so many distinguished scholars from Universities all over the world have gathered here to exchange views and take counsel on "The Role of Asian Universities in the Changing World."

I would like to congratulate the sponsors of this Conference for their efforts in making preparation for this Conference.

I would like, however, with your permission, in my address to just confine myself to this region of South-East Asia — this turbulent part of Asia whose progress, fate and fortune I have followed so closely — both as a Minister as well as an ordinary citizen, much more so in my capacity as a member of the Government.

The years immediately following the end of World War II saw the emergence of India, Pakistan, Ceylon, Burma, the Philippines and Indonesia as Independent and Sovereign nations. And it was only in 1957 that the then Malaya achieved its Merdeka or its independence. In exactly a week's time, this country, now called Malaysia, is just 14 years old as an independent and sovereign Nation and the University of Malaya is also about the same age. Today the University has a student enrolment of 7,380 as against 654 students ten years ago. Today, the annual cost of running the University is about 28 million dollars as against 3.3 million ten years ago. This year, 1,977 graduates have qualified as against 33 ten years ago.

Since 1957, when this University was first established, it has made phenomenal developments. This is due to the ever increasing demand for higher and University education. To meet this evergrowing demand for education at all levels, the Malaysian Government last year spent 481 million dollars on education or about $\frac{1}{4}$ of our National Budget as against 135.5 million dollars ten years ago, or 14% of the 1957 Budget. We, naturally, are now spending more money on Education than last year. This expenditure on education will continue to rise in the years to come.

There are now three universities in the country and it is expected by 1973 another university — the University of Agriculture — will be established.

As a developing Nation, Malaysia is fully aware of the role of our institutions of higher learning in the context of achieving our basic objectives of greater economic progress and national unity. While we continue to improve our strategy and technique for action to meet the needs of a fast developing country in an equally fast changing world, perhaps our experience as a multi-racial nation may set a pattern which other countries with similar problems may find it useful to see and study.

It is widely accepted that Malaysian institutions of higher learning are being called upon to educate large numbers of students which were not previously anticipated, to respond to the expanding claims of government and industry and other segments of society; to adopt and channel new intellectual currents. Naturally this tendency has led to a phenomenal growth of universities with its attendant problems which may be found in some developing countries.

Today, more than ever, education is inextricably involved in the quality of a Nation. And the University, particularly in Malaysia, and I presume in other Asian nations as well, has become a prime instrument of national purpose. This is the essence of the new role and challenge which lies before us.

In this context, I believe Asian universities are faced with four major problems — the problem of growth, the problem of shifting academic emphasis, the problem of involvement in society and the response of students to a changing pattern of society. In the case of Malaysia, the transformation is from an essentially traditional and agricultural society to that of an increasingly developing modern state with a growing number of motivated citizens.

When the present University of Malaya was planned, it was expected at the most that the student enrolment would be about 7,000 in 1972. Yet this figure has been exceeded in 1970 — two full years earlier than the target date. At the present rate of passes in the Higher School Certificate classes, the demand for University places will continue to rise sharply as the years go by.

In California today, four out of every five high school leavers seek further education and soon it will be even more. Here in Malaysia, a similar pattern is developing and in this respect we are in no way very far behind the developed countries of the West i.e. more and more of our young people are seeking higher education. Perhaps, a similar situation is also being experienced by other developing Asian Countries. This great shift in the pattern of education will undoubtedly call for many more colleges and universities to be established in Asia.

The privilege of university education is a great one: the more widely it is expanded, the better for any country or community. It should be looked upon as the key to open many doors of thought, knowledge and advancement of a life time. However, if I may say a few words of caution to education planners and authorities, university education ought not to be too practical.

The duty of a university is to teach wisdom, not just trade, to mould character and not merely to teach technicalities.

In the present age of technological advancement, we want engineers but, at the same time, we do not want a world of Engineers. We want Scientists but we must be able to keep them at their proper places. The late Sir Winston Churchill described science as "an organized curiosity." Therefore, be careful, we may find out too much. After all, what we find out is not entirely unadultrated gain. Although we are in the great scientific age, we still need to instil in the minds of our students and fellow men a feeling of love for arts, literature and beauty. Therefore, we still need artists, musicians, poets and even politicians like me!

If I may say in my own words, it is essential for any university to meet adequately the national needs and human aspirations of the country in which the University is situated. In a developing country, there is always an urgent need for trained manpower and, therefore, universities must produce graduates who are possessed of relevant skills able to participate and play their part in the technological and economic development of the country.

In a country like Malaysia, which has its own peculiar problems, it is necessary that the University of Malaya should cast its own mould in order to meet national needs. Malaysia is a multi-racial country and, therefore, our important and urgent task is to promote goodwill and harmony among our people of various races and to instill in them a sense of belonging to the Nation. In other words, our national aim is unity among our people — unity within the Nation as well as unity between economic and social groups. Therefore, our whole education system and indeed our universities should focus their thoughts towards this national aim.

In order to achieve this unity, we must create a society which is just, liberal and progressive — a society in which all our people of whatever racial origin have an equal opportunity to enjoy the material well-being of the Nation. While initiative and enterprise are being encouraged, the weak and the disadvantaged must also be assisted so that they will have a righful place in our country. We aspire to establish a liberal society where our people can practise and profess their own religion, culture and custom, consistent with our objective of a united Malaysian nation. We also desire to have a progressive society which will keep in step with the spiritual, scientific and technological advancement and progress.

These are our national problems and national aims which must inevitably guide our universities in casting their own moulds as well as in producing potential leaders and trained manpower in our country.

Ladies and Gentlemen : We in South-East Asia and indeed in Asia are living in turbulent times. While we are faced with problems of economic and social progress to meet the rising expectations of our people, we are continually being disturbed by the troubles of internal strife which are being inflicted upon people in so many countries of Asia. Obviously, it must be the duty of all of us to try to bring an end to these various strifes which are causing so much suffering and miseries among millions of people. Our universities in Asia and South-East Asia should, therefore, try to mould a new generation of potential leaders with knowledge and experience so as to appreciate and have respect for each other's economic, social and other problems. It is only by this way that we can bring about a new generation of leaders and intellectuals imbued with spirit of understanding and co-operation so that we can bring to an end the strifes and sufferings brought about by ideological differences which have caused the present divisions among the Asians.

It seems to me that university authorities in Asia would do well to co-operate in various fields of studies as well as in their research programmes. Research programmes undertaken by a group of universities would minimise duplication of efforts. In addition, such joint efforts would serve to promote greater co-operation and understanding and to serve the interests not only of the universities but the whole region of South-East Asia and Asia.

We in Malaysia are wholeheartedly committed to the idea of regional co-operation because we strongly believe that in the present modern age, no country can survive, let alone prosper merely on its own. It is necessary for countries to work together with one another in economic, social and other fields particularly with their immediate neighbours. That is why I feel co-operation among universities and students of countries in Asia would go a long way towards fostering understanding and goodwill among the people of Asia which will help to blow away the dark clouds of war and strife that are looming across the horizon of this region of ours.

It has been suggested that we might consider the establishment of a University of South-East Asia. While I would not wish to make any further remark beyond this on this subject at this stage, I would personally like to see more co-operation at university level, more regional conferences and seminars to be held in order to bring Asia and South-East Asia's best talents together to exchange views and experiences with one other. By this way, I have no doubt that we shall be able to forge stronger bonds of understanding and friendship among the Region's intellectual elites. I can assure you that we in Malaysia welcome this co-operation and will do everything possible

to encourage our citizens, our students and our intellectuals to play their part in fostering regional co-operation and promoting understanding and goodwill among peoples of Asia so that we can bring about the much desired peace and prosperity to this part of the world.

On this note, ladies and gentlemen, I wish your conference all the success it deserves. I hope that in the course of your deliberations, you will be able to throw some light on the many problems facing the countries in Asia and South-East Asia and thereby assist in bringing about solutions to them.

OPENING ADDRESS

by

V. Prakash,
(Organising Chairman of the Conference)

The Hon'ble the Deputy Prime Minister and the Director of Operations Tun Haji Abdul Razak, the Hon'ble Ministers, Your Excellencies, the delegates to the Conference, Ladies and Gentlemen !

It is one of the most auspicious and momentous occasions for us all, to have assembled here at the opening ceremony of the "International Conference of Universities" which has an important task ahead of it, to focus its week-long deliberations on the "Role of Asian Universities in a Changing World".

More so, because it is falling close to the Merdeka Celebrations of our country and in view of 1970 being the International Education Year.

Recognising its deep sense of responsibility and indebtedness to the entire academic and student community and to the Malaysian Society as a whole, the Academic Staff Association, University of Malaya, undertook to organise this International Conference from the beginning of March this year. It had been a tremendous task to organise such a Conference in rather such a short period, but the Academic Staff Association feels it greatly rewarding. Perhaps, this could not have been possible but for good co-operation from many quarters, and full encouragement and support from the University of Malaya authorities.

We sincerely hope that this Conference will be able to provide a fresh stimulus towards specific roles and functions of Asian Universities, in modern Asia that is changing, both in the life of the individual and in the development of the continent as a whole.

It is the intention of the Conference to provide as far as possible a forum for active dialogue between students, teaching staff, administrators, local and national officials and research institutes, so that the objectives of the University in Asia can be discussed in the light of the perspectives and commitments of the different parties.

It is hoped that there will emerge from such discussions, concrete suggestions for possible inter-university co-operation in Asia, University reforms and restructuring of the existing Universities and bases on which new Universities could be modelled.

We are highly grateful indeed to our beloved Tun, the Deputy Prime Minister and the Director of Operations, who had graciously consented to declare open this Conference, despite his multifarious and highly important engagements. He has always been a source of inspiration to us. He was our first Minister of Education after Merdeka. We are greatly thankful to our guests who have assembled here and particularly to all our overseas and outstation participants. We wish to convey to them in no uncertain language that we are indeed very happy to welcome them.

Education in all its aspects has become the largest single factor in our public affairs. More people, more human energy, both in work and study, are engaged in this field of endeavour than in any other field. More of our collective resources are devoted to this function than to anything else. This predominant role of education is now getting widespread in Asian countries. However, the rate of growth in recent years in Asia has been particularly large, and effects of this massive growth on our education institutions have been rather particularly severe. I understand that there are 428 Universities in Asia with a student population nearly touching three million.

As Asian higher education has gradually grown in scope and complexity since the colonial masters have left from Asia, many new specializations have arisen among its functions and personnel. There has been undergoing towards education something of a revolution, though silent in certain Asian countries yet vitally significant. An upsurge of higher education is further imminent, for more and more youth and their parents are realising the worth and of University Education stemming primarily from social and utilitarian considerations — possibly in many cases merely a paper degree qualification. The compound effect of this hunger for higher education in Asia has a striking effect on every part of our educational system, and especially the Universities.

Role of a University in Asia ought to be treated as of utmost importance, especially when Asia is passing through a tremendous transition and change. A period of profound transition is not the time for complacency. We must take stock, subject problems to perpetual scrutiny and look ahead not only on national but also on regional levels.

Well-planned education in Asia in its equality and excellence can be the master — fountain for all high level manpower development, flourishing economic growth, genuine social, cultural and political advancement within the framework of individual nations. Education must come to the rescue of Asia by being the vitalizing ingredient for energizing and achieving national aspirations, national productivity aims, national modernization, national integration on different communities with diverse ethnic backgrounds and even rural as well as urban *renaissance*. The acid test of a country's wealth in human resources is the proportion of its youth with the right type of educational training, know-how and skill. It is, therefore, vitally incumbent especially on a

University in Asia to play increasingly an important and rewarding role to meet such needs rather urgently by expanding, consolidating, adding more useful and relevant curricula, adjusting and improving over its existing facilities and staffing position. The immediate pressing demands of the social, cultural, economic and political systems in Asia require new orientations, approaches and extensions of higher education and its challenges of our times. Much has been done but much needs to be done.

The future development of any country largely depends upon the quality of its people and the first possible education must therefore be offered to as many people as possible. In terms of national aspirations, Universities in Asia ought to be able to contribute fully to the maximum development of human resources available within the country, so as to energize the process of increasing the knowledge, the skills and the capacities of good many people in Asian Society as a whole. In terms of economics, it would mean the pooling of educated human capital and its wisely planned investment for obtaining the maximum national economic growth. In political terms, human resource development prepares the *raayat* with intellectuals as nuclei, for adult participation in political maturity, and far-sightedness, particularly as citizens in a democratic set-up. In terms of social and cultural view-points, the well planned development of human resources facilitates the masses along with the intelligentia to lead fuller and richer lives, less bounded by out-moded traditional bondage, religious conflicts, cultural diversities, language difficulties, ethnic interests and racial animosities. A University in Asia, therefore, must be ready to interwine a range of relationships with the need and problems of Asian society. It must transform itself in the real sense into a true nursery for future all-round scholars, good citizens and highly skilled professional people.

Since the University, being at the pinnacle of an educational system, has a vital role to play, this Conference will reflect on Asian University education, its functions, methods, problems, future development and co-operation.

INTRODUCTION

INTRODUCTION

by

K. S. Nijhar *
Faculty of Economics and Administration,
University of Malaya,
Malaysia.

I

PUBLICATION OF PROCEEDINGS

Man's pursuit of the truth has been his characteristic from the primal stage, a search which is constant, a search which has been engendered by his spirit of inquiry and his unquenchable thirst for new knowledge. In this process, old experiences, ideas and beliefs are frequently questioned, sometimes discarded, and at other times expanded by new concepts, aspirations and discoveries as man moves forward to meet new demands and new challenges. This process also paves the way for progress but for progress to be meaningful, the seeds of knowledge from the few — the experts, the men of thought and the discoverers — must be disseminated and sown among the many so that mankind as a whole can benefit from such advances of knowledge.

This Conference formed another inroad, though admittedly a minute one, into this search for knowledge. It continued to encourage Man's spirit of inquiry and hoped thereby to contribute in a very small way to the infinite pool of knowledge built up by Man over the centuries. It also allowed, by this publication of part of its proceedings, to open up a fraction of the world of knowledge created by the few for the benefit of the many.

It is unfortunate that this publication was so delayed: the Conference was held in 1970 and the publication is coming out only in 1972. It is also unfortunate that not all the papers could be included in this publication: thirty-two papers were presented at the Conference and only twenty are being published. The primary reason is due to the inability to obtain, on time as well as the required amount, the funds. The funds were eventually made available by the kind generosity of the Academic Staff Association, under whose name this book is being published. The funds, however, fell short of the amount required to publish all the papers in this book.

Fortunately, the delay in publication does not have a significant adverse effect since the issues discussed at the Conference are relevant

* In editing this book, I received considerable assistance from Miss Kalpana Sinha, B.A. Hons. (English). This assistance is gratefully acknowledged.

even today, and will probably remain so for sometime in the future: a delayed publication therefore seemed preferable to no publication. Fortunately also, some of the papers not included here are being published in other more reputable journals: the knowledge advanced in this Conference therefore continues to be disseminated amongst a wider community.

II

BACKGROUND TO THE CONFERENCE

This book, as can be seen from the title page, contains selections from the papers presented at the International Conference of Universities held in Kuala Lumpur, Malaysia, between August 24 — 29, 1970. The official theme of the Conference was 'The Role of Asian Universities in a Changing World'.

Sponsored and organised by the Academic Staff Association of the University of Malaya, the Conference was designed to enable academicians from Asia and other parts of the world to define, to discuss and to contribute, from their specific experiences, to the revolution in thinking about University education which is so significant today in Asia.

Change has been a striking characteristic of the 60s in Asia. It seems evident that the 70s will undergo a similar experience. Education, particularly university education, should therefore contribute significantly towards meeting the new challenges being brought about by these new changes. Consequently, we witness that throughout Asia, urgent attempts are being made to establish institutions of higher learning which will suit the new social and technological conditions apparent in the 70s.

The rapid development of secondary schools in Asia has led to a pressing need for University education. Further, new and urgent social and technological challenges need to be met in the newly developing nations of this region. Hence, it will not now suffice for Asian universities to merely continue along the old quasi-colonial lines from which most of them have grown up. It is imperative for the future that Asian universities meet the needs and aspirations of the Asian people, and play a significant part in developing, uniting and modernising Asia at all levels in accordance with these specific needs and aspirations.

A Conference of this nature then, gathering as it did many academicians and men of thought from different parts of Asia and other parts of the world, could contribute towards a new progressive look in defining and solving some common problems faced in university education in a changing Asia. The Conference was deliberately

held in 1970 to coincide with the International Education Year, termed so by the United Nations in its 25th year of existence.

Credit should obviously go to the Academic Staff Association of the University of Malaya for its initiative and efforts in organizing and sponsoring this Conference. But the outstanding and knowledgeable speakers, from Malaysia and from overseas, will not be forgotten: it was their participation and contributions, more than anything else, which enhanced the success of the Conference.

III

CONFERENCE THEMES

The very nature of the official theme of the Conference expresses its latitude. 'The Role of Asian Universities in a Changing World' is a topic that is as wide, and as varied, as could be wished.

Consequently, the Conference comprised no less than nine General Sessions where various aspects of the topic were discussed in greater detail. At each Session, four or more papers were presented, often by speakers with divergent backgrounds and outlooks. The materials discussed were therefore wide and varied in content. To structure these deliberations into the consistency normally required of a book was not easy. It was obvious to the Editor that, at best, this seemed hazardous. Some attempt, nonetheless, has been made as is evident from the Table of Contents.

This structuring is discussed later below but, at this juncture, it would seem worthwhile to outline some of the main points which emerged from the papers presented and the subsequent discussions that ensued. The recurring points were :

1. Many speakers stressed that to understand the function of a university **in** the community, it was important to understand the the university **as** a community. The nature of the relationship between the various bodies within the university — the students, the academic staff and the administrative staff — had therefore to be examined.

2. A number of other speakers examined the complexities and the needs created by the problems of rapidly expanding higher education in Asia. In the last fifty years or so, for instance, the problems that arose in Asia with regards to students, the academics and the administrative staff were largely due to the lack of communication between them resulting mainly from problems of growth. The lack of dialogue created misunderstandings; these led to suspicions, and hence the gradual disintegration of the community spirit. This had to be understood, failing which it would be difficult to establish any meaningful dialogue between the various relevant bodies within the university.

3. The papers also touched on the teaching systems in Asian universities. Asian societies were undergoing rapid changes and their problems were becoming increasingly complex. Amongst other demands, there was also a tremendous increase in the demand for specialists in these societies. Consequently, the papers suggested that the teaching systems in Asian universities must change to accommodate new disciplines which would be better able to meet the new needs and aspirations of Asian students and the Asian society. Only thus can Asian universities play a more useful role in energising and modernising Asia.

4. Changes in the teaching systems, however, ought not be at the cost of research activities. The Conference papers reaffirmed the importance of research as an essential university function. But it was hoped that the individual's creative work would keep pace within the framework of society. Research in the universities, for instance, should also co-ordinate as far as possible with the socio-economic needs of industries, government and planning bodies. This could form an additional responsibility of Asian universities over and above teaching and conducting fundamental research.

5. A final point that recurred frequently was the need for Asian universities to serve their societies **more** actively than hitherto and to play a more positive role in helping these societies to find their proper bearings. The cry was for the university to move closer to society to whom it should render its services. In this connection, there was a necessity to understand, even if only partially, the relationship between the university as an institution and the state. Only then can a meaningful dialogue between the two be established.

These five points outline the sub-themes of the Conference. The Conference papers, of course, discussed these in greater detail than indicated here. Were it not for the fact that there was considerable overlapping of sub-themes and papers, the structuring of this book would have been very much easier. As it is, the overlapping was considerable, and the book could have been structured variously.

The structure set out here is one such possibility. The book is divided into three parts :

Part I, entitled 'The University as a Community', contains selections from the articles which analysed and discussed quantitative and qualitative changes in higher education in Asia, the connection between teaching and research, the inter-relationship between students and staff, and the many facets of the problems facing students — mental, physical and educational.

Part II, 'The University and its Curriculae', examines critically some aspects of the existing curriculae of Asia universities. The varied, and sometimes divergent, articles included here deal at some length with the theme of how Asian Universities can and should plan their curriculae to meet the needs of the societies they serve.

Part III, 'The University and the Community', elaborates on the interaction that should exist on as many levels as possible between the University and the community outside.

Together, these three Parts seem to cover reasonably well the five main points that arose in the Conference. It must be repeated, however, that this book does not incorporate all the papers presented. Hence, some gaps between the main points that emerged in the Conference and the papers included here seem unavoidable. Another point to note, as would become obvious after reading through this book, is that there was a bias in the selection of papers: papers dealing with problems faced in Malaysia or having some similarities to these papers were given preference in the selection-process. This was deliberate.

IV

THEMES FOR FUTURE CONFERENCES

No Conference can cover all it set out to achieve. Hence, it is useful, as a concluding remark, to attempt an assessment and to suggest what themes could profitably be taken up for future Conferences.

The Conference did not provide all the answers to all the problems it had set itself. But it was a useful step forward in Man's search for solutions to Man's problems. It was also a useful step forward in promoting and fostering goodwill, understanding and co-operation amongst participants and observers (who numbered nearly two hundred) as members of the International community of Universities. It put into perspective certain fundamental issues faced by universities in Asia. Discussion of the manifold and complex problems created by the rapid expansion of higher education in Asia and the need for Asian Universities to form an important and an integral part of Asian society seemed well covered in the Conference.

However, some crucial aspects were not covered, or if covered, were not dealt with in as much detail as would be wished. For instance, how in practical terms should the expertise of the academics be tapped for national development ? This was hardly discussed in the Conference proceedings despite the fact that one of the general sessions was devoted to the University's role in national development. 1 Attention was too often directed to what services the University should perform in the nation generally without always trying to isolate what precisely were the components of national development and how the academics could actually play their part in these components.

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1. This prompted me to jot down a few notes on this subject: see K. S. Nijhar, "Tapping the Expertise of the Academics for National Development", **TADBIRAN AWAM,** Journal of the Malaysian Society for Public Administration (To be published in the July 1972 issue).

Again, although much was made of the need for a dialogue to be established between the students and the academic staff in order to diminish student dissatisfaction and unrest, or to invoke a sense of responsibility among students, or to make the staff better aware of student problems, little was offered by way of positive suggestions as to how this could be brought about. Yet, this issue remains a crucial problem in a region where the ratio of staff to students in many universities is so much higher than that in the developed countries.

It is apparent then that the Conference fell short of some of its aims. Nonetheless, it cannot be denied that is was a significant step forward in some directions. As Dato Sheik Hussein bin Sheik Mohammad put it in his closing address :

"I sincerely hope that this Conference has provided the opportunity for academicians from Asian universities, as well as from universities outside Asia, to exchange ideas and compare experiences, thereby helping to promote goodwill and understanding among each other. Now that a start has been made, I expect more and more Asian universities will come together and hold Seminars and Conferences not only to discuss common problems but also to arrange for pooling together of their resources in research, teaching techniques and materials, and to work out staff and student exchange schemes. By working together in these, and other ways, not only will they obtain mutual benefits but they will also develop a spirit of co-operation and friendship so necessary in our present world of tension and conflicts".

PART I

THE UNIVERSITY AS A COMMUNITY

DEVELOPMENTAL PROBLEMS OF HIGHER EDUCATION IN SOUTH-EAST ASIA[1]

by

Chai Hon-Chan
Faculty of Education,
University of Malaya,
Malaysia.

I

Political, economic, and social forces set in motion by the struggle for independence from colonial rule and by the post-independence changes in South-East Asia are likely to gather momentum during the coming decade of the seventies, if not for the rest of this century. Current developments would suggest that the region will be moving through a critical period of turbulence and instability which began in the late forties and early fifties with the shifting of political power from late metropolitan centres in Western Europe and the United States to the administrative capitals of the new nations.

While a whole new generation has come of age since Hiroshima, the first generation of national leaders has either passed on or is ageing; and the second generation of political elites has inherited or will face national problems which are vastly more complicated than those which confronted the leaders in the fifties and sixties. Many of these problems stem from the gigantic increase in population which tends to cancel out whatever gains are made in national income. The burgeoning population, estimated to be about 276 million for the whole region in 1970, has more than 40 per cent under 15 years of age. This has exerted an inevitable pressure on governments to provide more education for the masses at a time when financial resources are scarce and the number of trained teachers is limited. Nevertheless, the expansion of educational facilities has raised the expectations of millions beyond the capacity of the changing social order to satisfy, mainly because economic growth has been slower than was hoped. Thus the euphoria of freedom and independence from colonialism has, in many instances, given way to a mounting frustration arising from the spread of unemployment and from the realization that more and apparently better education has not brought about the rewards enjoyed by an earlier generation.

Incompetence and corruption in some countries have not only retarded but actually reversed the process of economic development;

1. For the purpose of this paper, South-East Asia includes Burma, Cambodia, Ceylon, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and South Vietnam.

in others, war and revolution have devastated the land, demolished nascent institutions for modernization, and demoralized the people. Those fortunate enough to maintain reasonably stable government and a slow but steady rate of economic growth have found that economic development has not spread evenly enough to ensure an equitable distribution of the national wealth, with the result that the rich and powerful are getting richer and more powerful while the poor and impotent seem to be worse off by contrast. The urge towards industrialization has naturally benefitted the urban centres, while the rural areas appear to stagnate or make only minimal gains. Land-hungry peasants highlight the general poverty of the rural areas. The rising cost of capital goods from the industrialized nations and the falling prices of primary produce on which the developing countries depend for their financing of development projects are symptomatic of the widening gap between the rich nations and the poor. Under the weight of all these and many more problems of great complexity, constitutional regimes, which had been making slow and intermittent advances towards full-fledged political modernization, have faltered, and some have given way to autocratic and authoritarian or semi-authoritarian forms of government.*1*

This is the background of higher education in South-East Asia today. Change has always taken place in the region, although slow; what is staggering is the present rate and direction of change. In this setting, what is the role of the university, as the premier institution of higher education, in contributing towards economic growth, political stabilization and social progress and harmony? Is the university equipped to meet the challenges ahead?

II

One of the most important forces shaping higher education is the phenomenal population growth. The estimated annual population growth rate between 1900 and 1950 was 1.6 per cent, but between 1950 and 1960 it had risen to 2.2 per cent. During the latter period Malaya, Singapore, Thailand and the Philippines had growth rates exceeding 3.0 per cent. In 1960 the total population in South-East Asia was about 218 million; in 1970 it is estimated to be 270 million, and by 1980 it will be about 357 million.*2*

The population increase, coupled with powerful new ideals of democracy and the political imperative of mass education, has had an immediate impact on the educational systems of the region. Enrolments for primary education showed an average annual increase of nearly 7 0 per cent between 1955 and 1964. Due to the earlier in-

1. Eisenstadt S. N., 'Breakdowns of Modernization', **Economic Development and Cultural Change,** Vol. XII, No. 4, July 1964.
2. United Nations, **The Population of South-East Asia (including Ceylon and China: Taiwan), 1950 — 1980. Report III,** New York: UN Department of Economic and Social Affairs, 1958, pp. 26 — 27.

creases in primary school enrolments, the pressure soon made its impact on secondary education which registered an average annual increase in enrolments of nearly 12 per cent between 1955 and 1964. For the same period higher education increased by an average of 25 per cent per year. Table I below gives the absolute figures.

TABLE I

Estimated Enrolments in Primary, Secondary and Higher Education, 1955 and 1964

Country	Primary		Secondary		Higher	
	1955	1964	1955	1964	1955	1964
Burma –	1 156	1 916	181	503	10	21
Cambodia –	359	691	11	87	0.4	4.8
Ceylon –	1 289	1 795	366	751	4.4	16
Indonesia –	7 511	11 600	594	1 150	n.a.	180
Laos –	64	145	1.6	8	n.a.	0.4
Malaysia –	854	1 367	108	318	0.9	4.8
Philippines –	3 499	5 673	580	1 040	215	530
Singapore –	176	350	28	85	3.1	16
Thailand –	2 953	4 500	358	402	26	55
South Vietnam –	534	1 564	56	338	3.1	25
Total –	18 395	29 601	2 283.6	4 682	262.9	857

n.a. = not available

Source : UNESCO, **An Asian Model of Educational Development: Perspectives for 1965 — 80,** Paris: Unesco, 1966, p. 19.

The point that needs emphasis is that in the period 1955 – 1964 enrolments for higher education increased twice as fast as enrolments for secondary education. This may be accounted for by the fact that in the past facilities for higher education were extremely limited, except in the Philippines, and the vast increase in absolute numbers in secondary education was bound to exert pressure on higher education. Current trends suggest that the pressure on higher education will continue to rise. This may be illustrated by the proportion of higher education enrolments to secondary education enrolments :

TABLE II

Higher Education Enrolments as a Percentage of Secondary Education Enrolments

Country		1955	1964
Burma	–	5.5	4.2
Cambodia	–	3.6	5.5
Ceylon	–	1.2	2.1
Indonesia	–	n.a.	16.0
Laos	–	n.a.	5.0
Malaysia	–	0.8	1.5
Philippines	–	37.0	51.0
Singapore	–	11.1	18.8
Thailand	–	7.3	13.7
South Vietnam	–	5.5	7.4
Average	–	11.5	18.3

Source : UNESCO, **An Asian Model of Educational Development: Perspectives for 1965 — 80,** Paris: Unesco, 1966, p. 19.

The slight decline of the proportion in Burma was due to secondary school enrolments rising 178 per cent in period 1955/64, while higher education enrolments increased by 110 per cent for the same period; and although no data were available for Indonesia and Laos for 1955, it is reasonable to assume that there were absolute increases in enrolments.

Do these increases represent a genuine expansion of higher education facilities, or glorified high schools? Are the institutions adequately equipped and staffed to provide students with a reasonable standard of higher education? What is the rationale for the rapid expansion of higher education ?

III

One of the most important functions of the university is considered to be the training of 'high-level' manpower to meet the rising demand

for administration, technologists, scientists, engineers, doctors, teachers, and so on, for economic development. Because of its heavy reliance on the government for its capital and recurrent expenditure, it must be 'responsive' to development needs. While this function is repeatedly stressed in five-year development plans, and the quantitative targets for high-level manpower may even be stated, it is not always clear how the university is to perform this function. Uusally the manpower targets are decided by some government ministry, and the university merely 'responds', rather like a bakery receiving an order for a specified number of pastries. It is not clear how far universities are in fact involved in manpower planning, even though they carry the major responsibility of 'delivering the goods'.

To be sure, there are valiant attempts at educational planning to relate manpower requirements to output from the university, but this is usually in crude ratios of science and arts graduates. Seldom is there a detailed analysis of what kind of arts or science graduates that would be required so that the intake could be regulated accordingly. But in practice admissions policy seems to be guided not so much by manpower demands by the economy as the pressure from secondary school graduates clamouring for higher education. That is to say, admissions are influenced less by hard-headed economic calculations than by political and social considerations.

Statistics showing the aggregate increases in higher education enrolments are impressive, but an analysis of the enrolments by faculties or disciplines would reveal a continuing bias towards the arts, despite the repeated emphasis on the need for more science and technology graduates. The enrolment pattern in the University of Malaya may serve as an illustration.

TABLE III

Enrolment in the University of Malaya, July 1967

Faculty	Number	Percentage
Agriculture	202	4.43
Arts	2,132	46.76
Engineering	327	7.17
Science	878	19.26
Medicine	389	8.53
Education *	215	4.71
Economics and Administration	417	9.14
Total	4,560	100.00

* Post-graduate course.

Source : University of Malaya, **Nineteenth Annual Report, 1967 — 1968** Perchetakan Mas Sendirian Berhad, n.d., p. 184.

The cry for more scientists and technologists is echoed in the call for more science and mathematics teachers for the expanded

secondary schools, but a breakdown of the enrolment figures in the Faculty of Education in the University of Malaya for the 1967/68 academic session shows the following pattern :

TABLE IV

University of Malaya: Scholarship and Non-Scholarship Holders by Discipline, 1967/68

Discipline	Scholarship Holders	Non-Scholarship Holders	Total
Arts	69	91	160
Science	13	31	44
Agriculture	3	—	3
Total	85	122	207

Source : University of Malaya, **Nineteenth Annual Report, 1967 — 1968,** Kuala Lumpur: Perchetakan Mas Sendirian Berhad, n.d., p. 61.

Among the Arts graduates enrolled for the Diploma of Education course, there was a preponderance of those with a degree in History or Geography, the two disciplines which were in least demand in secondary schools. On the other hand, there was a dearth of graduates in English and Malay, and these were in great demand in the schools. Among the Science graduates, those with a degree in the biological sciences tended to outnumber those in the physical sciences and mathematics. and the latter were in greater demand than the former in the schools.

The increased enrolments in the universities of the region are therefore a response partly to manpower requirements for economic development, and partly to the pressure of secondary schools graduates demanding higher education. But the output in many countries does not seem to match the actual manpower requirements. This is suggested by the increasing rate of unemployment among university graduates. Considering that higher education is the most expensive on a per capita cost basis of the three levels of education, it highlights the waste of human and material resources, particularly when shortages of skilled manpower continue to be acute.

As pointed out earlier, there is a general distinction between the kind of skills required for rapid economic development and the actual output of the universities. The blame is usually put on the fact that the universities are 'too large' for effective teaching. There is some truth in this, but the fundamental problem is not with the increasing number of students but the fact that teaching methods and the structure of courses have not been adapted to the new situation.

Most of the universities of South-East Asia are modelled on Western, European or American institutions. In an earlier period they were elitist with a heavy bias on the humanities. With increasing numbers entering the universities, there has been merely a quantitative change: that is, more students are now able to take the same kind of courses in the same way that smaller groups enjoyed. The course offerings in the Arts are heavily traditional: history, geography, cultural studies, a smattering of sociology or political science. With some notable exceptions, the course offerings for the Sciences are based on a similar pattern. Only recently has there been an attempt to introduce cross-disciplinary studies in the University of Malaya, but the traditional patterns continue to dominate undergraduate courses. The University of Penang, however, has made a determined effort to set a new trend in integrating undergraduate courses in the Arts and Sciences. The limitation of course choices every year compels freshmen to sign up for courses in which they have little interest or which would be of minimal relevance to their future career.

The figures in Table III and Table IV illustrate the dilemma of the University: on the one hand it is anxious to 'respond' to the national demand for high-level manpower; on the other hand it seems unable to control the intake of students for academic disciplines which are in greater demand than others. Part of the problem lies in the flow of students through the entire educational system, from primary school to university. The Faculty of Education, for example, has no influence over the courses that scholarship holders take as undergraduates, whose choices indeed are largely determined by the secondary school courses they took. And whether a student enters the Science or Arts stream in the Pre-university (Sixth Form) classes in the upper secondary schools would depend on whether he was put into a Science or Arts class on the basis of a general selection examination at Form Three (Grade 9). The chain stretches back to the primary schools. The vicious circle is completed by the flow of teachers through the system: shortage in the output of science and mathematics graduates from the University means a shortage of potential teachers to be trained in the Faculty of Education, which consequently has a low output of science and mathematics teachers. The shortage of such teachers would naturally limit the number of science classes in the secondary schools. whose output in turn would determine the intake in the university.

The problem of the shortage of science teachers is compounded by the fact that science graduates who wish to teach have to suffer a major financial loss vis-a-vis their colleagues who join commercial and industrial enterprises. The teacher has to forego earnings for about a year while he is under professional training, while his counterpart who decides on a commercial or industrial career begins earning straightaway. Furthermore, the science teacher tends to start at a lower salary than the science graduate in commerce and industry. Except for scholarship holders bonded by contract to serve the Ministry of Education, those with a good Honours degree, for financial and other

reasons, would avoid the teaching profession, which therefore tends to get the second best.

The solution to the problem clearly depends on increasing the output of science graduates, that is to say, to produce more than enough to satisfy the demands of the private sector as well as the requirements of the schools. The key to the solution is to offer attractive incentives in the way of scholarships which should specify the courses of study for the recipients. For a period of time, let us say arbitrarily ten years, scholarships should be awarded to students with the best academic achievement in science. Note that only at the beginning of the sixth year of this ten-year period will the first batch of science graduates be teaching in upper secondary schools, and by the end of the tenth year, the first batch of secondary school graduates taught by the first batch of these teachers will be entering the university. But it will be at least another four years before the first batch of such secondary school graduates will graduate from the university. Assuming that this scheme could be put into practice in 1971, the circular flow will be completed only in 1985!

The preceding argument would suggest that the University must take a more active interest in the flow of students through the whole educational system. While administratively it is the responsibility of the Ministry of Education to direct the flow up to the Sixth Form (Grade 13), there is no reason why the University should not be able to do something positive to break the vicious circle. The problems facing the University of Malaya are not too dissimilar to those in other universities in the region.

Eligibility for enrolment in any course depends on the student's 'background knowledge' as shown by his examination results in secondary school. Apparently it is assumed that without this background knowledge the student would not be able to benefit from the course. On some occasions the numbers enrolled for any course would be limited by lecturers available to run it. Whatever the explanation, the undergraduate courses have the effect, if not the intention, of reinforcing the vicious circle mentioned earlier.

While it is continually stressed that university graduates form the 'high-level manpower' necessary for economic development, there is no general course in developmental economics which should be compulsory for all students, whether in the Arts or Sciences. Such a course should include an analysis of the problems of development and should aim at creating an understanding of the social and cultural values which promote economic, social and political development. For such a course it would not be necessary to have any 'background knowledge' in economics.

A necessary support for development studies is a strong department or even faculty of social sciences which could offer a wide range

of courses for undergraduates as well as stimulate research into social problems which underpin the development process. To be sure, some courses in sociology are available in certain departments, but mainly as minor courses linked with the more traditional disciplines. Similarly for some inexplicable reason, political science has been neglected. Without a corps of graduates in the social and political sciences, there has been a notable absence of research into the problems of plural societies. Without a body of empirical knowledge on the dynamics of social cohesion and political integration, the university seems to have inadvertently over-looked the possibility of serving as a consultant to the government in the formulation of policies designed to promote nation-building and the whole process of modernization.

V

The burgeoning enrolments in higher education will increasingly strain the teaching facilities of the university. Indeed it is not uncommon to find hundreds of students attending a single lecture, and the lecturer or professor becomes a remote figure whose voice can can be heard only through the microphone. The shortage of teaching staff makes it nearly impossible for professors to meet students in small-group tutorials, which are apt to be taken over by young and inexperienced tutors. How effective is the traditional lecture style in a class of 500 or 1,000 students? Is the answer simply to provide larger lecture halls equipped with microphones and amplifiers? Clearly there is an urgent need for research into the possible use of mass-media techniques for very large classes. Educational technology has made significant advances in teaching techniques, but it should be a supplement, not a replacement, of personal teaching in small groups.

Without minimizing the importance of personal teaching, it should be admitted that the majority of students gather the bulk of their information through reading rather than from lectures. Lectures and tutorials serve as catalysts to learning, suggesting fresh viewpoints and new approaches to old problems, but the task of acquiring knowledge rests with the student himself. In the context of the 'explosion of knowledge', one of the most fundamental skills a student must have is the ability to read fast and intelligently, but very few universities in South-East Asia train students in speed reading. Faulty reading techniques would unnecessarily hamper learning. On the other hand, skill in speed reading would enable a student to go through many more books and journals in less time and could result in a significant qualitative improvement in the level of learning.

Assuming that educational technology could be used as an aid to teaching, and students' reading skills could be improved, the quality of higher education would still rest on the standard of teaching. With large classes, greater emphasis must be placed on effective teaching. Yet the tendency is for universities to reward research and publication rather than good teaching, perhaps because the former is easily assessed while the latter is more difficult to evaluate. It is ironic that while

primary and secondary school teachers must be trained professionally, with certain minimum standards in academic qualifications, university teachers should be exempted from any form of evaluation of their teaching ability. Any suggestion that academics should have some training in teaching techniques or be evaluated for their teaching ability would be considered outrageous by the majority. It is not suggested that academics without any professional training in teaching techniques would **ipso facto** be poor teachers, for clearly this is not true. Good teaching could come out of experience as well as formal training. The problem is with good academics who are poor teachers. It may be that the majority of undergraduates make a success of their academic career despite poor teaching. If this is so, it would be reasonable to assume that there could be a significant improvement in the overall quality of higher education if there was some system of ensuring that academics should be reasonably competent teachers. Given the heavy responsibility of South-East Asian universities to teach and train large numbers of students, the reward system should be restructured to give as much recognition to good teaching as to research and publications.

VI

The foregoing are some of the immediate and concrete problems universities in South-East Asia face and must resolve. The more difficult questions about the role of the university revolve round the continuing controversy over the problem of 'commitment' and 'detachment'. While few would disagree that one of the most important functions of the university is to 'service' the country by supplying its manpower needs, it is not clear how far it should 'commit' itself to spearheading the modernization process by propagating new social attitudes and values. Academics from institutions which have been used to disseminating official ideololgies tend to favour the concept of a university that is concerned with impartial study and objective analysis of social, economic and political problems. Those from countries where universities have operated under a *laissezfaire* atmosphere tend to emphasize the need for 'commitment' to current problems.[1] But the choice is not really between 'commitment' and 'detachment'. Both are necessary since they need not imply mutual exclusion. The problem is how to strike a balance between the two. with relative emphasis on the one or the other, depending on circumstances. What is important is freedom to develop a scientific attitude towards the problems of society so that both teachers and students are given a wide range of options in social attitudes, cultural values and political ideals.

If the university is to fulfil its obligation to supply 'high-level manpower' for the country's economic development, it must take a

1. Myint, Hla. 'The Social Science', **Proceedings of the Asian Workshop on Higher Education, 18 — 30 August 1969,** Hong Kong: The Chinese University of Hong Kong, December, 1969, p.p: 61 — 62.

more active interest in the flow of students through the educational system in order to ensure that supply will match demand. If it sees its role as a change-agent, it must first ascertain what changes are desirable for whatever objectives there may be, and then introduce the appropriate academic courses that would promote those changes. Many of the problems South-East Asian universities face tend to spring from an ambivalent attitude towards 'detachment' and 'commitment'. While they are compelled to take in large numbers, they lack a pragmatic approach to problem-solving. If standards fall, they are apt to blame large classes rather than inappropriate teaching techniques.

Whatever the stand taken, and however the university defines its role, there is no escaping the fact that social, economic and political changes will have their impact on higher education. Its growth and development as the premier institution of higher education will depend ultimately on its capacity for innovation and change. This, in turn, hinges on the foresight and leadership of academics and university administrators. While universities strive for excellence, they must never forget that such excellence is often measured by the practical contribution academics and their students make to the progress of the society which supports them and to raising the quality of life within as well as beyond national boundaries.

SOME PROBLEMS OF EXPANSION IN HIGHER EDUCATION IN GREAT BRITAIN IN THE NINETEEN SEVENTIES

by

Mrs. Jean Russel-Gebbett
University of Nottingham,
England.

The Present Situation

Higher education in Great Britain to-day includes all forms of education beyond the secondary school stage. Compulsory education ends at 15 years but it is common for pupils intending to enter higher education to remain at school for a further two or three years. Indeed, there is legislative provision for special grants to poor families enabling them to keep a child at school for this further period. Thus higher education normally begins at the age of eighteen.

There is rich variety within the higher education provision varying from courses leading to diplomas in technologies (such as brewing and foundry engineering) and professional certificates (e.g., for social workers, teachers and nurses) to degree and post-graduate work.

Institutions engaged in higher education include regional and local technical colleges, which offer much part-time as well as full-time provision, the new polytechnics with their close links with local industries, colleges of education which are traditionally concerned with teacher-training and the universities which provide for over half the students entering higher education to-day. The newly founded Open University, operating through radio and television networks, aims to bring higher education to a wider range of home-based students.

Our system then is a complex one serving students widely differing in background, ability and aptitude. It aims to help these students not only to higher standards of technical know-how but also to improved intellectual suppleness. The individuals are encouraged to achieve their full potential and the community is enriched by a steady supply of higher educated manpower. Prediction of specific manpower requirements have not been very successful in our country to date and a large measure of freedom continues to be given to each individual to seek the higher education of his choice. Some control is, of course, exercised from time to time so that the community is adequately served. Extra grants may be made available to encourage courses leading to qualifications in demand. Further, a careful check is kept on the supply of recruits to the medical and teaching professions.

The roles of the various institutions are complementary and frequently overlapping. Students studying for external degrees of London University may be found in local technical colleges, and students taking Bachelor of Education degrees, awarded by many universities in England and Wales, will almost certainly be following their studies at a college of education. Excellence emerges in certain specialties in certain departments and institutions at various times. Carefully moderated examination methods ensure a fair measure of comparability in standards. The new Council for National Academic Awards has guaranteed an agreeble autonomy of syllabus to institutions of higher education who are now settling their examination format and also gives a welcome check on standards of student achievement.

This then is the pattern of higher education in Great Britain to-day after ten years of rapid expansion based on policies outlined in a series of Government White Papers viz: Technical Education 1956, Better Opportunities in Technical Education 1961, Industrial Training 1962, Higher Education 1963 and A Plan for Polytechnics and Other Colleges 1966. This autumn nearly half a million students will be entering the various courses of higher education.

The New Demand

Recent figures issued by the Department of Education and Science (D.E.S.) show a predicted demand for greatly increased provision of higher education places. They estimate that 825,000 places will be needed for full-time students in 1981 – 2 as compared with the 49,000 in the academic year which has just ended. Their predictions have been based both on the size of the age-group and on the increasing tendency for older pupils to remain at school to take further qualifications.

A facile administrative answer to meet the predicted demand would be to maintain the same proportions in the various sectors of higher education as now. Analysis of the demand, however, suggests that a different answer may well be needed.

Firstly, the Committee on Scientific and Technological Manpower, under the Chairmanship of F. Dainton, reported a sharp falling off of pupils seeking advanced level school courses in science and mathematics. Extrapolation of a graph drawn from the total number in science sixth forms in recent years leads to the gloomy speculation that the supply of recruits to science courses in higher education might have completely disappeared by 1984! Already some science places in university departments and technical colleges are unfilled. To plan for great expansion here without tackling the supply problem would be nonsense.

It is interesting to note that the swing away from science is accompanied by a marked increase in the demand for the social sciences and a moderate increase in courses in the arts and humanities.

A second factor which must surely affect the nature of expansion lies in the increasing reluctance of many eighteen year olds to commit themselves to any one profession at the age of eighteen. Colleges of Education, used to recruiting intending teachers, now find too many changing their minds about their vocation in mid-course. In consequence these professionally oriented colleges are seeking alternative courses and are keen to develop social work training and to develop general arts degrees. There has been no official approval for the latter development but it would undoubtedly go some way to meeting the extra demands for courses in social science, the arts and humanities. Degree work in the colleges has been firmly established in the growth of Bachelor of Education degrees under the helpful scrutiny and guidance of neighbouring universities. The work has attracted able men and women on to the staff of the colleges, has led to the improvement of their facilities generally and enhanced their standing in the higher education system. Teacher recruitment, the D.E.S. predict, will be slowed down in 1977 but the facilities will remain for more general studies to develop.

A third factor learned from conversations with headmasters and headmistresses in our area is the opinion that the present proportion of higher education places (half) allotted to universities is more than adequate if the courses there are to remain rigorous and academic. Those pupils whom they assess as scholarly are already entering universities without difficulty. The gap in the system seems to be adequate provision for the intelligent youngster who wants a broad and further course in a number of arts subjects. The polytechnics in this country have provided the answer for the able, more practical scientists, but these heads of schools speak wistfully of the liberal arts colleges of the United States which cater for general courses on the arts side. Could our colleges of education help to meet this demand in Britain? Or should the universities develop new, broader and less academically demanding courses?

Finally, I must refer to observations made by my university colleagues over the last few years of expansion. They agree that the entrants to the university in these years have been equally lively and able as any they have known. Those who feared that 'more would mean worse' have conceded their mistake. Nevertheless, an observation has been commonly made that a noticeable minority lacked motivation in their work. Among this minority, were some really able youngsters. They have come to the university without knowing what the work or life was like and they did not care for what they found. They dare not leave for their schools and their parents have supported them in their efforts to achieve their university place. They find the courses remote, the minutiae of scholarship tedious and the necessity self-discipline difficult to enforce. In my own Hall of Residence I have met an increasing number of these students who have 'drifted' into university and are neither vocationally nor intellectually driven to follow their studies with zest. They are dispirited, bored and at times angry men and women.

Meeting the Demand

While it is generally accepted that an effort must be made to meet the increasing demand for higher education in our country, the type of policy the government will implement is still unknown. The development of multipurpose comprehensive universities was seriously advocated by our last Secretary of State for Education. A system similar to that obtaining in the United States was envisaged whereby serious academic study must consequently be delayed until the post-graduate courses. In view of the existing rich variety of our existing system of higher education, I do not feel the comprehensive pattern would really fit the British scene to-day. Furthermore, the delay in selection for actual courses which the comprehensive university scheme implies (in the United States there is a large cut-back at the end of the first year) would cut right across the teaching traditions of our universities which aim at a close pupil-teacher relationship from the beginning of the university career and a minimal fall-out from the course.

Much more likely would be a selective expansion of existing institutions having regard to student supply and community demands. Even closer links will be called for between the various types of institution if transfer of students and adequate sharing of facilities is to be effected.

Problems in University Expansion

Turning now to expansion in the university sector as it exists to-day, expansion here will bring problems most of which have been foreshadowed in the last few years. In dealing with these it is important to state that university teachers speaking through their association, and vice-chancellors and principals, in a booklet published by their committee, wish to retain British universities as institutions essentially concerned with scholarship. Their function is regarded primarily as the conservation, interpretation and extension of knowledge and consequently universities need to retain an atmosphere where scholars, old and young, can research and converse without fear or stress in a common search for truth. All university staff recognise the need to play their part in educating the minds of young men and women who will invent and cope with the future and they wish to play a full but relevant part in the expansion to come.

Firstly, the process of student selection is a vital one in any period but even more so in a period of expansion. University work is not attractive to all able youngsters. It is common practice in Great Britain for students to be admitted to the university department of their choice on achieving good grades in two subjects taken in an advanced level ('A' level) examination at about the age of eighteen years. There are exceptional entry qualifications especially among mature candidates. Requirements for particular courses may demand certain additional subjects or certain combinations of subjects but the quality of the 'A' level achievement is the serious passport to university entry in our country to date. No mode of selection is perfect but this

particular criterion of fitness for university does not indicate the candidate's motivation, academic interests or capacity for unsupervised work — a few of the essential qualities necessary for success at university. Further, 'A' level is used as a selector for a variety of jobs as well as college entrance. It is basically a test of achievement ignoring the differences between the well-taught and the inspired, the over-achiever whose abilities are nearly spent and the genius who may yet be fired to scholarly heights.

Recognising the limits of 'A' level as a predictor, various universities have sought their own solutions by augmenting the information by other means. Favourite additions are the interview and the head-master's report. The former could be extremely helpful if properly structured. It seldom is and serves chiefly to enable the don and the would-be student to sense any affinity or antagonism. It possibly lets the student see a little of his potential place of study and this has its value. The interview method much treasured by our universities, must be properly conducted to gain the maximum use from the time and money expended if it is to continue in the days of expansion.

School reports can be extremely useful and can give much of the information complementary to academic achievement judged by 'A' level results. Again, these reports could be made more valuable by structuring the framework for reply. Perhaps psychologists might work out a simple personality inventory, based on successful university men and women, which could be filled in by schools and available to selection committees. A much fuller profile is needed for each candidate if selection is to be meaningful.

Most important, however, is the need for school children to receive serious and skilled vocational guidance. University teachers must be prepared to talk about the life and work in their institutions so that the would-be student obtains a clearer idea of the demands to be made of him and the career prospects of him.

The second problem which will concern us in the new expansion will be a threat to our generous and traditional staff: student ratio of 1:8. In spite of our crude selection methods in the past, the fall-out rate amongst students has been the lowest in the world. Of this we are extremely proud and, because of this we are anxious when we see intelligent students under-achieving. The jealously-guarded staff: student ratio enabled the British ideal of a university education to take the form of a semi-organised and continuing conversation between staff and students (alongside that between staff and staff, or student and student) persisting in the seminar room, the laboratory and the common room. Teaching and learning by stringent and fearless argument has survived the European countries from the time Socrates walked with students in the garden, through the days of Abelard and Newman who acknowledged the importance of the method even though they may be accused of using it for their own ends. Nobody in the university world can afford to neglect this essential teaching method

even though modern technology provides us with exciting new modes of presenting factual material. The basic need to refine knowledge and seek the truth still demands contact of mind with mind.

The generous staffing of our universities has fostered tutorial type teaching over the years. The increase in student numbers will again challenge the maintenance of a staff: student ratio of 1:8. Before a decision can fairly be made on this issue a properly-based job analysis must be done to discover if there are aspects of a don's work which could be more efficiently done by the employment of auxiliaries or more modern techniques thus freeing him to spend more of his time on good teaching and research.

The growing size of institutions brings critical problems of communication and this at a time when there is an increasing demand for realistic participation in the governance of universities from the students (and staff) themselves. Close staff-student relationships can, I believe, contribute grealy to effective 'informal' communication and debate about current issues. Casual conversations do not replace the need for a genuine and formal structure of participation in decision-making but the informal and unselfconscious conversation between senior and junior members of a community can break down psychological barriers and dispel unhealthy suspicions which can corrupt the learning enviroment in a large soulless institution.

The relationship between senior and junior common room has altered radically in the last decade. The tutor once regarded himself as pastor as well as instructor to the students in his charge. Pastoral care is an anathema to the present college student who is so grown-up that we can but wonder at the biological revolution! Even our country's laws have changed to concede eighteen as the age of majority. These changes demand that staff and students of a university regard each other as partners in a common venture and, if we can capitalise the energies and agile minds of the young into constructive development of our places of learning, all must be gain. Old dons are having to learn new techniques and all this takes time and application. But the venture is not only stimulating and creative, it is essential if a large institution is to maintain an atmosphere of trust and common venture amongst its members.

Inevitably, the demands of the next decade are going to underline the need for efficiency in teaching itself. Each university teacher, faced with more and lively students, must surely examine his methods critically, and survey and select from the different techniques now available to him. Each subject makes its own demands for appropriate presentation. Each field allows for some mass instruction as well as intimate and detailed discussion. Perhaps shrewd programming can give guidance enough for a considerable amount of ground to be covered by the student on his own. The important issue is to maintain enough class contact for adequate feed-back and readjustment to take place. The employment of a variety of techniques needs careful and

advanced learning and selection. Students are used to high-class presentation through the mass-media and they are intolerant of the third-rate. Inadequate lecturing is unbearable to all but the devoted and the insensitive. Furthermore, our schools have predisposed students to expect an active part in any learning situation and university departments must look over their shoulders in an effort to understand the learning environment on which they must build.

Other problems of expansion must receive brief mention only. Not because they are less important but because my concern has been primarily with the effect of increased size on the invaluable teacher-taught relationship.

There will be calls to rationalise courses and abandon small departments. Also, there is the demand for new general courses and the revision of old syllabuses. Response to these demands will be effected in the expansion by the universities' expected role in higher education provision in the future. Certainly, too, claims will be made for the greater utilisation of plant. This must come about but care must be exercised that it is not done at the expense of crippling the work of the supporting staff in the university. Adequate increase in personnel is essential at all levels if plant is to be efficiently and continuously used.

Thus I am brought to my final point. There will, in the years ahead, be great demands on the time and energy of ordinary university staffs who are the people who must solve the day to day problems as they arise in their own institutions and give guidance to those starting degree work elsewhere. It is, therefore, essential that a firm stand be made to preserve time and energy enough for these dons to pursue their research interests without question or hindrance. Whether a man be humbly engaged in consultation of references or materials for his teaching tasks or working at the frontiers of knowledge, he should have facilities and time to make his efforts really worthwhile. Only in this way can the university fulfil its obligation to conserve and extend knowledge. Nor is it feasible in times of expansion to denote one university institution as a teaching institution and another as a research centre. Excellence in both these functions will arise. Contributions to knowledge, new discoveries and theories will arise wherever the inspired men may be. Ideas will refine and develop in the day to day conversation between students and staff and may lead to advances as unpredictable in their nature as in their origin. It is essential that all staff are free and able to pursue their individual research, however pressing seem the new teaching demands.

In conclusion, the critical issues arising from a general expansion of higher education seem to be the selection of appropriate entrants for the courses available and also the prediction of the areas of higher education most likely to be in demand. As far as the universities are concerned, there is a need to develop every means to prevent the depersonalisation of teaching and to ensure that expansion of student numbers does not enforce neglect in the area of research.

THE INTERPHACE BETWEEN TEACHING AND RESEARCH

by

B. C. Stone
School of Biological Sciences,
University of Malaya,
Malaysia.

In the ongoing struggle for development in the so-called undeveloped countries, administrators usually accord the universities an important role. In this role, both education and research are implied or demanded, which from the standpoint of a university faculty member means that he is often called on to distinguish "teaching" from "research" at least on paper if not in practice. In this connection I would like to give a few views which are by no means new, but which periodically must be repeated because there is clearly a tendency to forget them. And I must limit my scope here to science. There is indeed research going on in other fields, non-or quasi-scientific, but in this paper when research is mentioned I specifically refer to scientific research.

To the general public and many non-scientists, science is a term which would include several distinguishable elements from the viewpoint of a working scientist. Technology is often equated with science rather than seen as an application of science. Research is sometimes viewed as a mysterious process, carried out by-white-frocked intellectuals in an intricately equipped laboratory filled with million-dollar gadgets; or, alternatively, as something everyone can do merely by visiting the library and looking up three reference books. Teaching tends to be considered as what goes on in the fifty-minute hour when a haggard instructor reads his lecture notes to a bored class of 250 undergraduates.

Besides these misconceptions we have recently seen the addition of another, which is that the university is mainly a training ground for specific professions or employment.

The particular topic I wish to discuss is the relationship between research and teaching in science.

For the undergraduate, the years leading to the B.Sc. or Honours degree are now mostly years of being part of a great herd of students faced with the task of absorbing an immense number of facts. Since the number of facts increases all the time but the length of a university degree course remains the same, it is obvious that with the passage of time we must continually modify the process of teaching. The develop-

ment of more and more subdisciplines and fields of specialization, indeed of new disciplines, increases the student's field of choices but restricts him more and more to a partial view of science, and for that matter to a partial world-view. And added to this is the increasing number of students entering universities for scientific studies, placing greater burdens on the university facilities, the staff, and also bringing about stiffer competition between the students and less individual contact between faculty and students.

All of these problems are intensified by the great pressures arising from the need for trained personnel, the planning demands of national administrations, and the increasing complexity and scope of scientific or technological problems.

For some universities, such as those which have an Honours B.Sc. program, there is in the Honours year some amelioration of these difficulties. The staff-to-student ratio then is greatly improved, affording greater individual contact. And, with a period of intensive fact-mastering behind them, the Honours students can turn (or be turned) to the other and more important aspect of science, that of creative research.

The central part of science is not the mastery of facts, but matching hypothesis with fact, the search for underlying causes that bind facts together. Nonetheless, the mastery of a considerable body of facts is absolutely necessary, just as learning words is necessary to use a language.

In the Honours year, most students begin to receive not only a kind of teaching experience which is demonstrably closer to what ideal teaching should be, but also the chance to explore the creative aspects of science, perhaps for the first time. For some students this is a crisis, for others a boon. And of course, the ones who find themselves capable may decide to go on to postgraduate study.

The are different opinions about what postgraduate study is supposed to be. One approach is the 'sink or swim' method; the student picks a topic, and from there on he is on his own. If he learns anything it is entirely due to his ability and effort. No 'teaching' is supposed to mar this isolated and severe actively. In a few institutions something like this does go on; and in most institutions, there may be some students who prefer this approach. But more often there is, in fact, something which we may identify as 'teaching' which is still going on. It may not be a formally organized class (and often is not) but there is interaction between faculty and student, and especially between those closest to the student's research topic. In the laboratory or in the field, or even at the lunch-table or in the coffee-room, teaching goes on. Especially, teaching is going on at the very time when the casual inspector of the scene might say that research was going on. The point, which as I have said is by no means new, is that teaching and research are indissolubly linked aspects of

the activity which in general we may term post-graduate education. This I think need scarcely be reiterated to most members of science faculties, but it does need repetition to others concerned with the university of today in some way.

Students of course vary enormously, both in the time duration needed to reach the level of scientific creativity, and the kind and degree of the latter finally reached. A few really outstanding elite students who are entirely self-propelling reach their level without (or even in spite of) the university teaching. But most will need teaching, and the only chance they will have for the really intimate, intensive, one-to-one type of teaching experience will be in postgraduate work. In turn, this will be tied up with research. The faults of most undergraduate years can be eliminated during these postgraduate years.

There is a fairly wide-spread conception that Asian students learn by rote, and this is not without basis. Rote-learning is easier on the teacher, and is easier to standardize; (and is not limited to Asia). It is also, unfortunately, often necessary. Whether intensive rote-learning promotes creativity is another matter; it would appear more likely to impede it. But, speculation aside, there is in my personal experience no doubt that creative thinking can be nurtured, and that high-quality graduate students will emerge from our new and developing universities, if we pay special attention to the fact that teaching and research must go hand in hand. Speaking purely on personal experience in the last few years, I would say that some of my graduate students have been excellent on any basis, and I am proud of the remark made by one external examiner that "this was the best thesis on this topic that I have ever read." There is nothing wrong with our 'raw material' but it is up to us to provide the best facilities.

At this point I wish to diverge temporarily from generalities to make a specific point. This is, that (other things being equal), it takes longer to reach the creative level of science in the biological sciences than in some others. To substantiate my point, let us recall that biology is built upon a foundation provided by chemistry, physics, mathematics, and some geology. Hence a student must know the basic material in this foundation area. Further, the higher levels of association — whether of organ, organism, species, or community — are less 'exact' and subject to variability. Because of this, a longer apprenticeship is required to obtain experience. The fact that most precocious geniuses are either mathematical or adept in sciences where mathematics is much involved, i.e. theoretical physics (Einstein!) provides proof of the above point. The undergraduate course, for different reasons, will no doubt continue to be uniform for all students or nearly so; but at post-graduate level, we should not expect all students to finish their degrees in the same period.

Coming back to the main topic, I think the conclusion we can draw is that the formation of a postgraduate school of research

studies is required in at least the top universities of each country. And, contrary to a usual misconception, such schools are just as much involved in teaching as are the undergraduate institutions. If anything, the teaching is better for the reasons listed above. Ironically, part of the results of being successful in the undergraduate years, which may well be part drudgery, is the opportunity to enter into a more nearly optimum learning situation. Such a school should have a wide diversity of research projects going on, spanning the distance from 'pure' to 'applied' science in research. The former will 'feed' the latter, and in addition, the students will be able to see the relationship, in practice, of these linked but distinct activities.

In conclusion, I must recall the truism that the teacher must be ever learning, and the student must realize that education is a never-ending process. Presumably the greatest success a teacher can achieve is to produce students who surpass him in ability, knowledge, and creativity. 'Produce' is the wrong word here, of course. Such students 'produce' themselves. However, the majority can be helped in the university; it can promote, direct, refine, and stimulate each student in his best interest, and it is my belief that the graduate school, with its direct particiption in research, as the most appropriate kind of teaching, is the best means of so doing.

THE UNIVERSITY AS A COMMUNITY

by

Francis Wong Hoy Kee,
Faculty of Education,
University of Malaya,
Malaysia.

Introduction

Since World War II the pattern of university life as a community has changed fundamentally because of the impact of three inter-related sets of forces :

a) the explosion of knowledge which has doubled in certain fields even within the last ten years;

b) the increasing complexity of our technological society which demands increasing number of skilled personnel to keep it functioning smoothly; and

c) the realisation by governments everywhere that education, especially higher education, is essential to the economic, political and social development of a country.

These are powerful forces which have changed education and society in our world in general and in Asia in particular. As far as can be ascertained and short of a collapse of civilisation, they are irreversible, so that one can expect more changes in the years that lie ahead.

Recent happenings in institutions as widely separated (in pattern as well as geography) as the University of Rangoon, the University of Buenos Aires, the University College of Ibadan, the University of Paris, the University of Barcelona, McGill University and the University of Tokyo indicate that all is not well today with the university as a community.[1] An important aspect of the main theme of this Conference — The Role of Asian Universities in a Changing World — is precisely the role of the university as a community. We all know that Education mirrors Society, just as Society is partly moulded by Education. If the Asian university is to function as a community and make positive contributions to society at large, then it is important to understand the relations between the various members of this community (the students, the academic staff, the adminisarative staff, and the relationship between the university and the state) in order to bring about a meaningful dialogue between them at all times. Lack of communication brings about misunderstanding, and misunderstanding leads to suspicion which is the fundamental cause of the breaking up of any community or society.

1. **Rangoon** (educational differences). In 1953 the announcement that vacations would be cut in half caused the students of the University of Rangoon to go on strike. Police had to break up the strike on the second day.

The Students

Let us take the students first since they, in ultimate truth, are the **raison d'etre** for any university. They have increased greatly in numbers all over Asia. Take the case of the University of Malaya here in Kuala Lumpur. In 1961/62 when it was one of two Divisions (the other being the University of Malaya in Singapore) the student enrolment was as follows: 556 students in Arts, 203 in Science, 53 in Agriculture, 198 in Engineering, 34 Higher Degree candidates.[2] This year (1970/71) the student population has increased to 7779 (3266 in Arts, 325 in Agriculture, 1360 in Economics, 429 in Education, 394 in Engineering, 631 in Medicine, and 1364 in Science).[3]

Equally important is the change in attitude among the students. Fifty years ago the typical Asian student regarded his admission to a

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Buenos Aires (domestic differences). Students of the University of Buenos Aires took over the University the day after Peron fell in 1956, who then forced the new government to recognise their demands which included participation in the election of the new rector, dismissal of Peronista professors, stiffening of the curriculum and removal of abuses such as absences of the professors.

Ibadan (racial differences). Students of the Ibadan University College broke out in open dissatisfaction in 1958 when the University authorities, who were overwhelmingly English, attempted to place wire fences around the entrance to women's dormitories. This action was considered racially insulting. The University closed its gate in protest but was forced under pressure from the government and public opinion to reopen without reprimanding culprits.

Paris (financial differences). In November 1963 students of the University of Paris went on strike against the inadequate financial provisions for the universities by the government.

Barcelona (religious differences). Students of the University of Barcelona protesting lack of freedom of their organisations were turned out of a monastery by the police in which they convened a protest meeting in 1965. This breach of sanctuary caused young priets to rally to the students' cause. Attacks upon the demonstrating priests by the police caused tensions between the government and the senior church hierarchy on one side and public opinion on the other.

Montreal (ethnic differences). In December 1965 students at McGill University were forced to choose between joining the Quebec French-speaking union of students or remaining in the Canadian English-speaking and Federal association from which the Quebec union withdrew. A referendum was taken as a result of which McGill remained outside the French union, thus accentuating the animosity between the English-speaking and the politically active French-speaking students.

Tokyo (international differences). Students of the University of Tokyo joined the Zengakuren (the Japanese students union) in opposing the signing of the Japanese-American security treaty in 1960. By attacking the U.S. Press Secretary Hagerty after his arrival in Tokyo, they effectively prevented the visit of President Eisenhower to Japan and brought the resignation of the government of Premier Kishi.

2. Annual Report of the University of Malaya, 1961/62.

3 Statistics supplied by the University of Malaya Administrative Assistant, Academic and Records Section.

university as an opportunity for which he was most grateful. Today a large number of them (having passed the appropriate examinations and qualified for government grants) regard admission to a university as a right. They know that the future of their country lies in their hands, for they realise that the rate of future economic growth depends on their being trained and equipped with the necessary skills at the tertiary level.

These twin changes (quantitative and qualitative) in present-day Asian students make it vital for university authorities to adopt a new approach to first, how they handle the students, and second, how they teach and organise university curricula.

Gone are the days when universities could regard students as irresponsible people and tried to do everything for them. Today the latter must be permitted to form students' unions and sort out problems of their own and by themselves. Students' unions can be very effective in bringing about a sense of community, but if they are to do so, they must be treated as more than clubhouses. Ideally a university student union should have two essential aims :

a) to provide the student with the opportunity to widen his horizon beyond his narrow specialised field of study; and

b) to develop in the student a sense of discipline and responsibility. Translated into practice, this would mean first, that the students will be provided with adequate premises and sufficient operating funds; second, that the students themselves will have control of these facilities; and third, that there will be regular meetings between union representatives and the members of the academic staff, and that all administrative officers be available for consultations. In all such meetings the students will be treated as equals, for consultation is a two-way process. Democracy in a university does not mean majority rule by the students, but it does mean that no decision affecting student interest will be made without prior discussion with students and without their consent

The approach to university teaching and organisation of university curricula has also to be revised. In the past the tendency was to welcome student opinion on domestic matters e.g. issues pertaining to meals at the university and halls of residences but not academic matters. But the syllabus, the methods of teaching and the examination system affect the students just as much as do eating and living accommodation, and it is difficult to see why they should be the exclusive concern of the authorities.

The Academic Staff

Fifty years ago there was communication between members of the academic staff of the various faculties and between them and

their students. Today there is less of such personal contacts. This is one fundamental reason why the university as a community is less strong than it once was.

Several reasons can be given for this unfortunate situation. The growth in size of universities from a few hundred students to many thousands have made them amorphous. The compartmentalisation of subjects (as illustrated by C. P. Snow) has resulted in a lack of communication between the Arts and the Sciences as well as between Staff and Students.

There is yet another fundamental force at work to hamper the life of a university as a community, that is, the shift in emphasis from teaching (fifty years ago) to research (today). Because of the explosion of knowledge the emphasis today is on research at all levels, especially the tertiary. Research is of course vital to any organisation, including a university. But research is only one function of a university, albeit a very important one. A university, worthy of the name, has to teach as well as be of service to society. In order to remain in the fore-front of his field, the professor today must spend a great deal of time in research — much more than was normally demanded of his predecessors fifty years ago. Again, financial assistance is more readily available for research than for teaching, and academic reputation is more easily won for research than by undergraduate teaching. The tendency therefore is for senior members of the academic staff to concern themselves chiefly with research and leave the teaching of the average undergraduate students to junior members of the teaching staff. The latter may become disgruntled as the load of teaching leave them with inadequate time for research which is essential for attaining academic eminence. Again, the trend today is for the academic plums to go to the brilliant researcher while the outstanding teacher is regarded as a second class citizen. Where the teaching staff is disgruntled the teaching is usually poor, and where there is poor teaching there is bound to be discontent among the undergraduates (which form the bulk of most Asian universities) and which can easily lead to an explosive situation.

The Administrative Staff

Broadly speaking, university administration fifty years ago was more simple than what it is today. Then most of the Rectors or Vice-Chancellors of universities in Asia had been professors and continued to teach. Most of the administrative work was done in an informal way by the professors themselves. The non-academic staff might comprise no more than a Secretary, a Bursar and a few clerks.

All that has changed. Take the example of the University of Malaya. Its growing size, the increasing complexity of its physical plant and the steady increase of revenue that it receives has created problems that demand corresponding growing numbers of full-time

administrative staff. Theoretically, the administrative staff takes some of the burdens off the shoulders of the academic staff and acts as a buffer between them and the governmental authority that nowadays supplies most of the revenue of the university. In practice, however, a sense of cleavage may develop between the administration staff and the members of the teaching staff due to a variety of reasons resulting in a weakening of the community spirit in a university.

Relationship Between the University and the State

The pattern of relationship between the university and the state varies from one country to another and even within the same country which has state and private universities, for example, in the Philippines. Having said this, one can also say that fifty years ago universities in Asia were generally more autonomous communities than now in running their own affairs within a minimum of day-to-day interference by government. They decided for themselves whom to admit, what to teach and how to teach it — and in so doing they strengthened their sense of community responsibility.

All that has changed. As government expenditure on universities become greater, political parties and taxpayers all develop a greater interest in what the universities are doing. Are they spending the money wisely? Are they teaching the right things?

If a country accepts the thesis that one of the primary purposes of universities is to educate the high-level manpower needed by the nation to acclerate its rate of economic growth, it follows, as a logical conclusion the necessity for some authority to decide intelligently how many and what kinds of high level manpower are likely to be needed in the immediate future. Linguists, economists and physicians are not inter-changeable, so that there is a strong tendency for government to decide, in the interest of national planning, what subjects should be taught by universities, which fields of knowledge should be made available to students and which institutions should specialise in their particular disciplines. Unfortunately in Asia where many universities depend on government grants to exist, the university is of necessity restricted to its right to decide what is to be taught and how they should be taught.

The University as a Community of the Future

It has already been suggested that the trends (of our changing world) described in preceding paragraphs are irreversible, short of a collapse of civilisation. We cannot hope to go back to "the good old days" so that if we wish to foster this spirit of community in the university, we must find new ways of attaining that goal. Below are three lines of developments as to how the components of this community may be better bound together in a bond of common spirit and outlook.

First, university administration must expand its scope of operations and become highly efficient. If the academic staff is to be encouraged to spend more time in teaching and research, it is imperative that the tasks of administration, the maintenance of day-to-day smooth running of the university, should be placed on other shoulders more fully qualified to perform such tasks. University administration must also deal with a lot more than it used to do in the past, for example to help students through counselling services, medical services and psychiatric services. Every student should know that he belongs to the university family and whom to go to when he is in need of help. Where funds are available, much can be done to provide attractive buildings and amenities such as sports grounds for students to work and play together. The university administration can use all these ways to create a true sense of the university as a community, especially if the administrative machinery is efficient and sensitive to the needs of staff and students.

Second, universities must place as great an emphasis on teaching as it does on research. The latter will always be of paramount importance, but equally important is teaching, especially in universities which has the bulk of its student population at the undergraduate level. Teaching is the oldest, and still the most vital, function of the university.

If there is a dialogue between the administration and the students and if the quality of teaching is what it should be, student dissatisfaction and unrest will diminish. But it is not enough merely to avoid trouble. More positively, it is also necessary to develop in the students themselves a sense of participation.

University authorities should set up machinery for regular consultations between staff and students through joint-committees. to deal with problems of discipline and to hear students' complaints. Details of pattern for such machinery are unimportant, but what is important is that students should know to whom they should go to when they have a grievance. They should also know that they will get a prompt hearing and be treated as responsible people in a discussion, and when their complaint is reasonable, prompt action will be taken to redress the grievance.

This is the first step which will lead to the ultimate goal, namely that the students should learn to discipline themselves, and in as wide an area as is practicable, to work out solutions for their own problems. As mentioned above, self-governing student unions should be given full responsibility for running their own buildings and student affairs. Above all, there should be friendly meetings between the Vice-Chancellor and elected members of the students' union as well as the teaching staff in order to solve problems before they become serious. The community spirit in a university is already present when the senior executive officer of the university is readily available to talk with (and listen to) both the representatives of the student body and

his academic colleagues. None of these will be easy, for they demand of the administration and the academic staff a great deal of time, tact and patience, just as it will demand of the students the sense of responsibility. But despite all these difficulties a university must strive to have this sense of community if it is to fulfill the role entrusted to it by society, that is, the education of the future leaders of Asian society.

APPRAISAL OF APPRAISAL SYSTEM IN ASIAN UNIVERSITIES

by

Sim Wong Kooi,
Faculty of Education,
University of Malaya,
Malaysia.

Scope

It is not infrequent for academics in Asian universities to be consulted, either directly or indirectly, on the appraisal system considered desirable for schools. Sometimes the universities are requested to determine the nature of examinations preceding university entry and, understandably, the universities tend to stipulate what they want and are relatively unconcerned about other objectives the schools have in mind, especially in regard to those who fail to gain admission to universities. Some academics have been involved actively in setting and marking major school examination scripts, presumably because they are experts in their own subjects and whether or not they appreciate the conditions prevailing in the schools is of little concern. At times their advice is sought by curriculum committees on the needed changes in schools and often times they have been involved in in-service training of teachers which tends to concentrate on upgrading content rather than method of teaching. In more informal capacities, university dons have sometimes acted as judges in school quizzes, science exhibitions, debates, etc, again presumably because academic criteria involved in judging are considered to be the only valid ones for schools. In short, academics in Asian universities have played, and continue to play, whether directly or indirectly, major roles in the appraisal system of schools and these roles have often been associated with having the schools accommodate to the requirements of universities rather than vice versa.

The foregoing remarks are by no means intended to denigrate the crucial role of academics in assisting schools to improve their appraisal system; rather, they have been made principally because of the nagging fear that university academics may not be eminently qualified to advise schools on the appraisal system they adopt or should adopt so long as many lack the experience or even inclination to appraise, or re-appraise, the appraisal system which obtains in their respective universities. The premise is advanced that as long as academics, including the writer, are not actively practising excellence in various aspects of appraisal that they preach, their advice and assistance to schools, even if acceptable as non-ivory-towerish, are of questionable worth.

Have academics for instance, been systematically and continuously concerned with appraising: How, When, Where and Why Who is to appraise What for Whom to make What kinds of decisions for Whose benefit based on Which criteria ? Are we satisfied with our existing examination systems, many of which have remained relatively unchanged from colonial days, or with the *ad hoc* arrangements for appraising such problems as student unrest or staff dissatisfactions as and when they arise? Is there no place for continual assessments or re-assessments of various concomitant aspects the curriculum we offer ? And must the assessment of students always take place in an awe-inspiring examination hall and the appraisal of diverse functions of our programmes be confined to the deliberations of formal and official committees? Do we appraise students merely to satisfy the ritual of assigning grades *per se*, and are we not neglecting other equally, if not more, important objectives of evaluations, such as to diagnose and prognose learning difficulties, to appraise the educational efficacy of the curriculum, to compare the performance of student cohorts over time, and so on?

Can and should teachers of courses assess the extent of their success or failure in an unbiased fashion, and should not students or an external agent be involved in such appraisals? Are we clear as to what comparative, deveolpment, pedagogical, psychological and sociological aspects can and should be reliably and validly appraised and also what features are most profitably relegated to external assessment? Can students and non-teachers, such as members of a university administration or a university council, make rational and responsible decisions concerning matters academic? If so, should they confine their efforts to decision-making processes which do not require specialised academic competence, or would efficiency, or even effectiveness, be sacrificed by pretending to please everyone by instituting a fully representational decision-making machinery? Are we clear in our minds whether the outcomes of an appraisal exercise will benefit individual students, the Faculty staff, the society whom they are expected to serve, or just some sacred cow which seeks to preserve our neanderthal system of examinations? Finally, is the feedback from an appraisal exercise translated in terms that are meaningful and useful to the prospective beneficiaries in terms of short-term and long-term goals and priorities ?

It should therefore be apparent that the proper appraisal of appraisal systems is both arduous and complex. Within the scope of the present paper, it will be necessary to confine our attention to two rather urgent and inter-related problem areas, namely the limitations of existing examination systems and the problem of wastage in terms of failure to graduate in minimum time or to graduate at all. Furthermore, since it would not be feasible to deal adequately, with the practices and problems obtaining in the vast spectrum of Asian universities, only general issues, with perhaps some illustrations from the University of Malaya, will be touched upon, in the hope that some, if not all, of them would be relevant to this part of the world.

Reappraisal of Examination System

Most Asian universities are characterised by a reluctance to confront what Baxter regards as "the skeleton in the university cupboard," namely "the subject of the accuracy of university examinations as a method of assessing performance."[1] Despite the carefully documented findings of Hartog *et al.*[2] more than three decades ago that it is extremely difficult to mark long essays reliably, the implicit reliance upon the long essay has remained unchanged. Malaysia is not a typical of Asian countries which have adopted and preserved examination systems from its colonial masters even though the latter have seriously questioned their examination systems which have progressively undergone changes hopefully for the better. The validity of examinations has, for instance, become the subject of frank and informed thinking in British universities, as is evidenced, for example, by an entire issue of **Universities Quarterly**[3] being devoted to the problem. Typical criticisms of examinations are that (i) much examining is inconsistent and arbitrary, (ii) they place too high a premium on speed and fluency and short-term memory, (iii) they do an injustice to the slow but thoughtful student, and (iv) here exists considerable uncertainly as to the purposes of examinations and whether the instruments are relevant to what are meant to be measured. Frequently changes are made in order to off-set administrative difficulties rather than to improve the reliability and validity of examinations. For example, objective-type tests are often employed as an expedient measure in order to save time in correcting increasing numbers of scripts, without taking into consideration the time-consuming but crucial process of constructing items which assess higher mental processes in the cognitive domain as well as various aspects in the affective and psychomotor domains.[4]

A possible breakthrough may have been affected as a result of a recent proposal by McGregor that Senate should discuss the reappraisal of the examination system of the University of Malaya. McGregor posed two fundamental questions :—

a) "Is our present system of assessment which is largely if not exclusively dependent on the end of year or end of course final examinations a valid, reliable and fair system?

b) "Is the obvious strain on many students (brought about by these examinations and reflected in physical and emotional difficulties as well as in cheating attempts) an inevitable accompaniment to assessment, or can it at least be reduced?"[5]

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1. Baxter, J. P. "Concluding Remarks", **Report of Proceedings of the Conference of Australian Universities,** University of Melbourne, 1961, p. 166.
2. Hartog, P., Rhodes, E. C. & Burt, C. **The Marks of Examiners,** London: Macmillan, 1936.
3. **Universities Quarterly,** June 3rd, 1967, Vol. 21.
4. Bloom, B. S. et al. (Eds.) **Taxonomy of Educational Objectives Handbook I: Cognitive Domain,** N. Y.: Longmans, 1956.
5. McGregor, A. L. Letter to the Vice-Chancellor on **"Reappraisal of the Examination System",** 13th March, 1970.

McGregor further points out that "Were no alternatives available it would be pointless to raise the matter and our policy (to date) of tightening examination security would indeed be the only answer. However it is obvious that other systems, or modifications of our present system are possible, are in practice elsewhere, and are indeed being tried out in small ways in this University."*6*

Arising from this proposal, a Senate Study Group was appointed to look into the question of examinations. While it is far too early to appraise the work of this group, since it has only had one preliminary meeting, several encouraging signs augur well for the future improvement of the examination system. In the first place, there has been overall concern among the representatives of the different Faculties and the Registry with the problems posed and willingness to explore frankly and freely the intricate network of questions associated with examinations. In so far as the writer is able to judge, there was genuine interest in listening to the existing practices and problems from one another or in explaining in as jargon-free terms as possible, in direct contrast to Senate discussions over the last two years or so where the tendency to be dogmatic and to preserve the status quo seemed dominant. Hitherto, when cases of cheating were reported, the only recourse available seemed to be adopt more stringent security measures. Allusions to the possibility of using a variety of appraisal instruments in a staggered fashion, rather than an end-of-year essay-type examination, or of the need to improve the formulation of questions tended to be construed as unthinkable at best or insulting at worst.

If the Study Group is representative of academics in the University of Malaya, the situation is indeed hopeful and bright, for besides being prepared to delineate and tackle the problems systematically and unhurriedly, the group seemed enthusiastic enough to come to grips with the pertinent and crucial long-term as well as short-term issues. The representatives have, for example, set themselves the next tasks of ascertaining the manifest objectives of their respective Faculties and the departments or divisions within each Faculty. It is likely that there would be differences not only in the objectives for each course but also in their orders of priority and each set of objectives would imply a different kind of examination system. In more technical courses, it would be conceivable that manipulative skills may be emphasised and may have to be assessed in other than paper-and-pencil tests. For a clinical medical student, whose wrong diagnosis and prescriptions can be fatal, tests of accuracy in retrieving information from a fairly extensive memory may be justifiable. As pointed out by Miller*7* :-

> "If it is agreed that a student's professional promise should be a criterion of examination success, then it might be wrong to 'waste' him because he failed in a highly theoretical paper that has

6. Ibid.
7. Miller, Gordon W. **Success, Failure, and Wastage in Higher Education.** London: George G. Harrap, 1970, pp. 198 — 199.

little to do with his probable future career. If the essential requirement of a profession were that the student should be able to synthesise and think clearly it would be foolish to 'waste' him because of failure in an examination testing his memory of factual material on a certain day. However important memory may be, it cannot be regarded as a principle and universal criterion. If the capacity to work persistently and to seek out data is required for the kind of work he is most likely to do, it might be incorrect to fail him because of failure in examinations requiring speed under stress. Because pursuit of knowledge is the main end of education, these examples will be regarded as heresy by many, and perhaps rightly so, but there is a case for some common ground between the academic world and that outside because there are several kinds of knowledge."

Admittedly, we have only taken the first of a thousand steps and we are not unmindful of the many hurdles yet to clear. Inadequate appreciation of the merits and demerits of alternative modes of assessment, such as the use of assignment or tutorial grades, open-book or take-home examinations, objective or practical tests, etc., can lead to possible misuse or abuse. Thus, the editorial of the student paper, **Outsider,** has rightly expressed its concern for possibilities of copying and the likely lack of objectivity in using tutorial or assignment grades. Before plunging into a novel form of appraisal, it would do well to ascertain the ways and means of ensuring that "such loopholes ought to be plugged first." [8] For instance, subjectivity might be minimised by prior agreement of detailed evaluative criteria among those who conduct tutorials, while copying of assignments might be reduced by incorporating greater specificity of the task required so that each assignment must necessarily be based upon individual and personal investigation.

When change is advocated it would be extremely difficult to overcome inertia which comes from individual staff transcribing the change in terms of the extra efforts he would have to make, however convinced he may be concerning the virtues of such a change. It could, for example, be recommended that in attempting to ensure comparability of grades assigned by various departments within a faculty, the following steps be taken as suggested by Auderhalter [9]:-

a) The mean Credit-point-average (CPA) is determined for all students at the end of the academic session for each department.

b) Available measures of student performance prior to entry correlated with the CPA scores.

c) The estimated CPA derived from the regression equation used to predict CPA for each student may be termed the "Potential Index" (PI).

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8. Editorial, **Outsider,** July 1970, 1 (3), 8.
9. Auderhalter, O. F. "Developing Uniform Departmental Grading of Students in a University", **Journal of Experimental Education,** 1962, 31 (2), 210–211.

d) The Departmental Grading Index (DGI) is computed by taking the difference between the mean CPA and the mean PI (ie. PI-CPA). If DGI is negative (i.e. PI CPA), the department concerned is regarded as "too liberal" in the grades it assigned, while if DGI is positive (i.e. PI CPA) the department is considered "too tough" in the grades it assigned.

Information of this kind could therefore help each department to make adjustment in the grades it assigns.

Even though the above steps could be routinised by means of a simple computer programme, the fact that a different procedure is applied, thereby entailing extra effort in trying to understand its significance and limitations, is generally sufficient to trigger off antagonism towards such a proposal.

And yet changes in the examination are inevitable and have been long overdue, as have been urged by different contributors to the 1969 volume of the World Yearbook of Education.[10] There has, for example, been increasing evidence to show that future eminence is poorly predictable by means of examination performance. It may perhaps become necessary to espouse a view not unlike the following statement :-

"If grades will not predict future eminence and if the early identification of outstanding talent is a task worth pursuing, there is a need to develop additional criteria of good student performance... As soon as education is considered in the context of certain social values and needs, it is evident that in addition to grades, other dimensions of student behaviour need to be considered..... Grades are not unimportant.....but within the context of some personal and social goals reliance upon grades as the **only** criterion of student performance is unwarranted." [12]

Problem of wastage

To the extent that examination grades of questionable reliability and validity tend to be used solely, examinations and wastage are inextricably intertwined. Holme has observed that "failure rates did not vary concomitantly with improved student quality – that is university examiners preferred to pass and fail almost identical proportions of students year after year than ascertaining the true calibre of the

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10. Lauwerys, Joseph A. & Scanlon, David G. (Eds) **Examinations and The World Year Book of Education,** 1969, London: Evans Bros., 1969.

11. E. G. Hudson, Liam, "Degree Class and Attainment in Scientific Research", **British Journal of Psychology,** 1960, 51; MacKinnon, D. W. "What do we Mean by Talent and How do we Test for IE ?" In **The Search for Talent,** N.Y.: College Entrance Examination Board, 1960.

12. Lavin, David E. **The Prediction of Academic Performances.** N. Y.: Wiley and Russell Sage Foundation, 1967.

students and adjusting their fail rates accordingly."*13* It is sometimes customary to grade students according to some notion of the normal curve, but if indeed students in many Asian universities are already highly selected the normal curve is probably inappropriate. Referring to the question of standards, Cummingham observed that "Those who defend high failure rates are almost sure to say it is unfortunate, but those who failed were simply not up to standard?... Whose standard?... How was it arrived at?"*14* The Robbins Report provides a useful summary of the relationship between examinations and wastage as follows :-

> "Differences in wastage rates are not explicable solely in terms of the quality of students admitted or in terms of the way they are taught. It is difficult to avoid the presumption that an important factor affecting wastage is that in some faculties there is an approximate percentage of students whom it has been customary to fail. This supposition is borne out by the fact that wastage rates have remained nearly constant in faculties whose entrance standards are known to have risen. In so far as there are grounds for this presumption they should be removed. It is essential that a student should feel confident that his success or failure depends only upon his ability and attainments."*15*

Besides examinations, a multitude of other institutional factors, such as teaching, counselling of students, staff-student relations and the institutional ethos, flexibility or rigidity of course requirements and extent of preparation for higher educaion by schools, which conspire to bring about wastage of various kinds. With the disproportionate stress on research, teaching in universities tend to become neglected. As faculties or universities increase in size "in order to cope with growing student population, there is a natural tendency to routinise and automate educational processes in the interest of increased efficiency,"*16* thereby departing more and more from the more Asian practice of maintaining a guru-disciple relationship in teaching. Thus, when closed-circuit television is employed its full advantages are seldom capitalised upon or, worst still, the needed preparations and adaptations of soft-ware are frequently neglected. In practice, teaching is therefore accorded an incidental role. As Macklin remarked. "It has always struck me as rather odd that universities, whose main function is, on the one hand, teaching, and on the other hand, learning, should have done so very little about teaching the teacher to teach, or instructing the student in the art of learning."*17*

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13. Holme, H. H. **Success and Failure.** Scientific Faculties of the University of Melbourne. Melbourne: Australian Council for Educational Research, 1955.
14. Cummingham, K. S. **Success and Failure** in Australian Universities. Melbourne: Australian Council for Educational Research, 1953.
15. **Robbins Report** or **Report of the Committees on Higher Education,** Cmnd. 2154. London: H.M.S.O., 1963.
16. McKeachie, W. J. "Research or Teaching at the College and University Level". In N. L. Gage (Ed.) **Handbook of Research on Teaching.** Chicago: Rand McNally, 1963, pp. 1118 — 1172.
17. Macklin, A. D. **Proceedings of Home Universities Conference,** 1951.

Student counselling is only beginning to make its impact in the Asian university scene. Even though the Counselling Unit at the University of Singapore did not seem to be able to attract students to it, those of us who have been consulted informally by students regarding their personal-emotional, educational-vocational, and financial or other problems, will doubtless be able to bear testimony not only to the growing need for student counselling but also to the similarity of problems as obtained in other countries such as those found among Australian students as shown in the Table below :

Distribution of Student's Problems at the University of Melbourne

Type and severity of student problem		As Percentage
1. Personal disturbances involving serious disruption of a student's life: psychosis, severe depression, severe family conflicts, sexual problems.	6	
2. Personal disturbances involving severe handicap, but not severe disruption of life: anxiety states, social isolation, less serious disturbance of the kind mentioned in 1.	10	16
3. Doubts and worries about future vocation	27	
4. Educational difficulties: difficulties in settling to study, reading and learning difficulties.	21	48
5. Minor difficulties requiring brief information and advice	22	
6. Financial difficulties	9	36
7. Other problems	5	
	100	

Source : Priestley, R. R. "The Mental Health of University Students." In E. L. French (Ed.), **Melbourne Studies in Education.** University of Melbourne, 1957, p. 13.

In Malaysia, with increasing opportunities for students in rural areas to enter the university. problems of adjustment involving those lower down the list in terms of severity tend to become magnified beyond proportions. A careful appraisal of the extent of provisions for student counselling is in order, even though as a start a student counsellor is likely to be appointed soon.

Similarly, the typical image of an ideal lecturer in an Asian context is unlikely to differ very much from that found from a study involving 1,777 students at the Michigan State University, namely that :

> "He is usually active in both civic and religious affairs and rather active in campus activities. He is willing to discuss a student's career plans and personal problems but lets the student make his own decisions regarding politics and religion. He is well-versed in his subject matter, teaches in an entertainment manner, makes his students work, and grades objectively. He does not attempt to indoctrinate students in any particular belief." *18*

While such an animal is probably non-existent, close approximations to this ideal should come readily to one's mind if one has had the benefit of studying under reasonably conscientious and enthusiastic teachers.

Depending on the kinds of environmental press *19*, the values placed on examinations are likely to differ. In most Asian universities which are dominated by a press for "intellectual orientation" or "scholarship," examinations are likely to remain an entrenched tradition for a long time to come. Where a university is characterised by a press for "friendliness" or "community" in the student body, it is possible that mutual help among students may help to reduce wastage in examination performance.

Then there is also the problem of how the schools have readied its students for adjustment to university life. As has been so succinctly pointed out by the Hale Report.

> "The magnitude of the leap forward depends ... partly on the extent to which his school has launched him on the process of thinking for himself ... even at the best students coming to a university straight from school find themselves suddenly saddled with more responsibility for ordering their lives than they have had to take before; and in their approach to their subjects many, perhaps most, students on entry to university have hardly got beyond the stage of taking their opinions from authority and expecting to find the 'right' answers to all questions in a textbook".*20*

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18. Lehmann, Irvin J. "The College Faculty as Perceived by Graduates and Non-graduates," **Journal of Educational Measurement,** 1966, 3(2), 169 — 173.

19. See e.g. Pace, C. Robert and Stem, George C. "An Approach to the Measurement of College Environments," **Journal of Educational Psychology,** 1958, 49, 269 — 277. (Some 30 kinds of press — e.g. press for achievement, understanding and orderliness — are purported to be measured by the College characteristics Index developed by Pace and Stem).

20. **Hale Report** or **Report of the Committee on Teaching Methods,** University Grants Committee, London; H.M.S.O., 1964.

A crucial institutional variable that is often responsible for wastage is termed selection. With increasing politicisation of education, universities tend to have less say in selecting students. Even if universities are completely autonomous in respect of selection, what criterion should be employed in selection? For example, it has been found that neurotic introverts are the most successful students.[21] Does this mean that we should select neurotic introverts whenever possible? Do we want most of our graduates to be neurotic and introverted? There is also some evidence that students who succeed in examinations are not necessarily the best professionals. What other criteria should we use and how do we go about ascertaining suitability based on these criteria? It is pointless to try to improve selection without corresponding adjustments made to other components of the educational institution or even the educational system. But, can these changes be easily effected ?

As a case in point, the bulk of the students admitted for the Diploma in Education course are students who have been awarded teaching Scholarships during the first year of their university career. Many accepted the scholarships as a pass-port to the university but have no intention to become teachers. Thus at the point of entry, or in dribs and drabs during the course, some of them drop out. Among those who remain, not only are they of generally poorer quality and usually incompetent to teach subjects most needed in schools, but they have the poorest attitudes which are likely to persist when they join the teaching rank and file. To partially off-set this problem the Faculty has had to increase its intake of private students beyond projected targets and also to devote more attention to students who are generally weaker. Obvious though the changes are, it is apparent that they are by no means simple when viewed in terms of many associated repercussions. In sum, it is beyond the purview of the Faculty to control selection and in order to reduce the chances of wastage, other institutional changes are found to be necessary.

With inadequate control over selection, wastage arising from various student variables is inevitable. The variables which have been consistently found to relate to academic success are interest, curiosity, aspiration and study attitudes.

Schonell et al. summarise the findings as follows :-

"The student who has a good measure of persistence, industry, organising ability, thoroughness, who is well adjusted and motivated, is excellently armed to overcome such handicaps as average intelligence, poor home environment or university short-comings in arrangement of courses, in lecturing, or in tutorials. Indeed a personality which will go on grappling with problems and overcoming difficulties is the most priceless asset to any university student. Conversely, a student who appears to possess every advantage of both intelligence and environment may lack per-

21. Furneanx, W. D. "The Psychologist and the University," **Universities Quarterly,** 1962, 17.

sonality strengths of these kinds and become a failure in university studies."[22]

There are other variables which have produced inconsistent findings. It is possible that they have not been understood fully as yet. Anxiety has for example been found to have a curvilinear relationship with academic performance, rather than a linear one as was assumed in earlier studies.

Similarly, anxiety interacts with motivation, as was illustrated by Atkinson and Litwin.[23] They showed that students who were high in anxiety about tests, as measured by the Mandler-Sarason Test Anxiety Questionnaire and the Thematic Apperception Test, tended to complete the examination quickly and to perform poorly. They were motivated by fear and tended to avoid the situation which aroused their anxiety. Students motivated by hope tended to stay in the examination room longer.

Then there is a host of variables which have least influence in academic performance. Included in this category are age, ability, peer relations, social class and time spent on extra-curricular activities. Although they seem to be relevant to academic performance their relationship is often marginal. None of them is very influential on its own, but only when acting jointly with others. Thus, for example, age of itself is not a very crucial variable, but it is often observed that some of the youngest students are most outstanding and this is probably due to the fact that his early arrival at the university usually followed an outstanding school career. Similarly, time spent on extra-curricular activities is of no consequence unless there is an actual neglect of studies. One reason why ability is of less fundamental importance is because as a result of the highly selective processes, the spread of ability at the university is generally not so great. By the same token, social class is less significant because even if lower-class children are on the average inferior to middle-class children, the few of them who succeed in entering the university represent only a small percentage of the most able and most highly motivated of then social class.

Some Final Words

The main thesis of the present paper is that there is ever-increasing need for academics to appraise their appraisal system before they can adequately and confidently become fully immersed in assisting schools to appraise their appraisal system. Two problem areas have been singled out as deserving immediate attention. Of these, problems pertaining to the examination system are probably more familiar, but

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22. Schonell, Fred J., Roe, Ernest and Meddleton, Ivor G. **Promise and Performance — A Study of Student Progress at University Level.** U. of Queensland Press, 1962.
23. Atkinson, J. W. and Litwin, G. H. Achievement, "Motive and Test Anxiety conceived as Motive to Approach Success and Motive to Avoid Failure." **Journal of Abnormal and Social Psychology,** 1960, 60, 52 — 63.

at the same time there is a predominance of diehard attitude bent on preserving the status quo.

Problems of wastage are more amorphous and probably most neglected among Asian universities, for most universities do not carry out systematic appraisals into nature and reasons for wastage, together with ways and means of overcoming it. At most, the vast majority of universities have enrolment figures and numbers who pass, but these are grossly inadequate for any worthwhile investigation of the trend of wastage across Faculties and over time.

Perhaps it may ultimately be necessary to set up a Centre to Appraise the Appraisal System of a given University, with the sole purpose of carrying out continuous appraisals of various aspects of the university programme and making available feed-back information in order to enable staff and students alike to plan ahead or to make necessary adjustments. The essence of a proper appraisal is that it should result in enlightened follow-up action. If, for instance, appraisal suggests that there is a tremendous gap between the preparation of students in schools and the requirements for higher education, academics may have to become more involved in the schools' programmes. In a survey of 610 institutions, Gordon and Wilkerson *24* discovered that almost half are adopting one of four general approaches in order to off-set the deficiencies of disadvantaged groups, namely :- (1) special help to schools and individuals with pre-unversity preparation, (2) special recruiting procedures and special admissions criteria, (3) special counselling, tutoring and remedial courses following entry to university and (4) development of special curricular, sometimes involving lengthened time for completing the degree.

It is perhaps not too far-fetched to conceive of a time when academics can ill-afford to tackle their problems at their very origins, namely in the schools. They might become better equipped to assist schools to appraise their appraisal system if and when they become more involved with appraising their own appraisal system, articulating and integrating that which is obtained in the schools.

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24. Gordon, Edmund W. and Wilkerson, D. A. **Compensatory Education for the Disadvantaged: Programs and Practices Preschool Through College.** CEEB, 1966.

EMOTIONAL PROBLEMS AMONG UNIVERSITY STUDENTS-THEIR CAUSES AND EFFECTS

by

E. S. Tan
Department of Psychological Medicine,
University of Malaya,
Malaysia.

While it is true that university students the world over have problems because of their adolescence and because they are in a university, the university students in this part of the world have a number of problems which arise out of the cultural situations which are rather peculiar to the social matrix of this country and these are related to the educational system, the cultural attitudes and mores and so on. They give rise to problems which sometimes bring the student to psychiatric consultation but these are not so numerous.. A more important reason for this report is that such problems do arise with some students and they could hamper a student's scholastic effectiveness and hence have to be recognised and dealt with by university teachers, particularly at the undergraduate level.. This report, which is largely descriptive and in no way analytical, is derived from my observations in both my roles as a clinician and as a university teacher. It should be stated that while students who come up to see the psychiatrist or who are referred for consultation are relatively few, the smallness of such population cannot by any means be taken as an index for their infrequency. It has to be realised that seeing a psychiatrist still carries a social stigma in many ways even with the university population in this country and many such problems are dealt with by university teachers at their own levels, and by the Masters and Fellows of the residential colleges and by the physicians of the Student Health Service, but frequently the student suffers in silence until he is at the end of his tether.

Rote Learning

Even up to this point in time, the Malaysian Government supports schools in four "language streams", in Malay, English, Chinese and Tamil, although the process of converting all these into schools in which Malay, **(Bahasa Malaysia),** as the medium of instruction is already in process. Arising out of the various traditional systems of instruction — where ideographs have to be memorised in the Chinese schools and passages of the Koran have to be learnt by rote in Islamic schools by Malay children — rote learning is very much a part of the school life of many children in this country. This system is further reinforced not only at primary level but also in secondary schools where the children are being prepared for examinations by teachers who

give "notes" to the students, the contents of which are for memorisation. This is not often stated as such but the purpose of such "notes" is all too clear. The student who is able to commit much of this to memory is often rewarded with a high grade and much praise. At university level, some students continue this mode of learning. They will attempt to take verbatim notes at lectures and few will even attempt to commit passages of prescribed texts to memory.

This method of learning of course does not enable the student to develop any critical ability at all, Some students are quite unable to evaluate the material that they read; they are unable to distinguish principles from details and manifest this by filling their term papers with plagarisms often from given references,

This effort to commit a whole mass of material to memory of course takes a tremendous toll on these students both physically and mentally, and the students complain of symptoms such as headache, palpitations, inability to concentrate, a feeling of lethargy, insomnia and a host of other complaints, none of which have any physical basis at all. The frequency of such complaints take almost epidemic proportions a few weeks before the final examination of the university. Students often complain they cannot remember what they have read. What the complaint really means is that the student is unable to commit to memory any more of the material that he has read because he had memorised such a lot already. The intensity of this effort to memorise often crescendos as the examination approaches and is often aided by the use of drugs, stimulants to keep them awake till the small hours in the effort to memorise, and then sedatives to counteract the effect of the stimulants taken earlier in the evening, and stimulants again in the morning so that they can be awake at lectures the next morning to take more notes for further memorisation. Many students collapse from physical prostration at the examination hall and "have to be stretched out on the ground like casualties on a battle field".1

Examinations

Such catastrophic occurences at final examinations can only indicate the importance of examinations in the life of the student. In the education system in Malaysian schools, examinations are made the chief means of evaluation of student competence and achievement. There are examinations at the end of each term in the case of some schools, but certainly in the middle of the year and at the end of each year. There are public examinations held at the end of the six years of primary education and at the end of the third, fifth and seventh years of secondary education. Promotion to the next stage of education or entrance into the university as in the case of examination of the seventh year of secondary school are all very much dependent

1. PATRICK, E. — "Emotional Stresses in University Students" in **Psychological Problems and Treatment in Malaysia,** Ed. by Wagner, N. N. & Tan, E. S. Univ. of Malaya Press, 1970.

on scores at such public examinations. This is also the important mode of evaluation at university level.

Such a system of evalution can only have the effect of making students study for the sole purpose of passing examinations.[2] Time is short (university is in session for only three terms each ten weeks long) and because of the multitude of information that has to be assimilated (and as far as these students are concerned, committed to memory), there is very little time left for much else. Many students, particularly the weaker ones, would even abjure participation in any extra mural activity in order to have more time to study for their examinations.

For a lot of secondary school students free time is spent either in studying by themselves at home or taking tuition to catch on subjects they are weak in. A great deal of parental concern and expense is directed in this fashion. The natural curiosity of students to explore knowledge for the sake of knowing is stiffled very early. Indeed, few Malaysian students read anything outside of their chosen subjects and at that hardly anything outside the prescribed texts. The daily newspapers and the occasional periodicals are about the only non-academic material read. This, of course, at the university level, has the tendency to convert the university curriculum into something like that of a technical school. One finds that students in the science and in the technical faculties such as Medicine and Engineering know little about the humanities and have very little desire to do so.

Parents, particularly in the middle-class homes reward good performance in examinations and make no attempt to disguise their disappointment when their child attains a low grade or rank position in the class. Ranking is a common practice in almost all schools in this country. At university level students get very upset if their grades are not as high as they expect them to be, and if this happened at all, the student would make a stronger effort at more intensive learning in the sense of more intensive memorisation.

Initiative

This system of learning which has been instilled in the children right from a very tender age stifles the students' curiosity to gain knowledge for knowledge's sake. As a result, the students very often show very little initiative to cover other areas unless they are directed to do so by their teachers. This is very often seen when students are given projects and assignments. The given references are very closely adhered to, very little critical evaluation is made of the material read and students make very little effort on their own to introduce new material or points of view that are not touched upon either by the teachers or the references consulted. What is also very disconcerting to teachers particularly those who have studied abroad is the fact that students are very hesitant to contradict their teachers

2. WONG, R. — "Emotional Problems of School Children," Ibid.

even when the latter are obviously wrong. Listening to a lecture is analgous to "sitting at the feet of the **guru**" in the best Asian tradition, but partaking of a university education with such uncritical and unquestioning attention is often unsalutary for the students and most disconcerting for teachers. However, one has to realise that it takes much more than the physical transposition of the student to the university situation to wipe out the centuries-old tradition of unquestioning obedience inculcated before his arrival on campus.

Student Rebellion

It of course seems foolhardy to be complaining of students' submissiveness when the trouble in universities the world over is that of student rebellion. But the problem here is often one of the students themselves being afraid of being considered rebellious if they so much as disagreed with the point put forth by their teachers. Indeed, it is my experience that rebelliousness on the part of the student is often followed by a period of remorse, expressed in terms of fear of retaliation on the part of the authorities. While it is not entirely unrealistic that the students may be discriminated against by their teachers, if they had been defiant in any way, in the case of a few students I had the occassion to speak to in the clinical situation, this fear is more an expression of **guilt** which they feel for having transgressed the deeply ingrained traditional precept that one does not contradict one's seniors, particularly if they are also one's teachers as well !

There are other emotional problems confronting Malaysian youth, such as the difficulty in obtaining employment, the problem of cultural orientation and cultural identity, etc.[3] which are not peculiar to the university situation and hence fall outside the scope of this paper.

Solutions

In describing these problems among university students I have tried to relate them to social and cultural situations which to my mind are their antecedents. Some solutions to these problems are obvious even from my description. If students can be taught to abstract the essence from material they read right from an early age, the need for rote learning vanishes except in such areas as learning the vocabulary of a new language. This technique of learning is especially urgent in coping with the 'knowledge explosion' that is occurring in most fields of learning currently.

While the passing or failing of the civil service examination in ancient China meant a big difference in the subsequent course of the scholar's life, contemporary studies in education and psychology have proved beyond doubt that examinations by themselves as a system of evaluation are neither entirely reliable nor valid. Longitudinal

3. TAN, E. S. & WAGNER, N. N. — "Youth in Malaysia" in **Youth, A Transcultural Approach,** Ed. by Masserman, J. H., New York, Grune & Stratton, 1969.

evaluation of the student's performance over the whole period of the course and evaluation by teachers who have personal contact with him over a period of time are some of the other methods of evaluation needed to supplement examinations. Further, credit should be given in the evaluation of students' ability for the demonstration of such attitudes as *initiative* and *originality of thinking*. If this method of evaluation can be initiated at the level of primary schools, learning at university level would then become a more welcome challenge and a more satisfying adventure rather than a sheer drudgery of memorisation which many students now view it to be

The students can be taught to think critically and in an original manner. Constructively this approach need not in any way be viewed as rebellion and therefore need not be contradictory to traditional mores and value orientations.

Further, if the local universities could be persuaded to be original themselves and not cling to the colonial tradition of dividing the academic year into three 10-week terms in which all the teaching and learning is done, leaving the students unoccupied for the other 22 weeks in the year, but rather to extend the terms with more sensibly spaced vacations in between, this will not only give the students more time in which to learn and to explore the world of knowledge but it would also enable the teachers to plan their work more effectively and have a more substantial contact with the students.

In addition to these empirical solutions more quantitative studies will have to be made on such problems as the degree of neuroticism among university students, the amount of memorisation that is being done, the degree of aggression and many other variables and the relation of these variables to each other, so that a more scientific effort can be made to help our students become more effective scholars and better educated people

IMPORTANCE OF STUDENTS' HEALTH SERVICE IN ASIAN UNIVERSITIES

by

J. D. Chari
Students Health Centre,
University of Malaya,
Malaysia.

Introduction

The importance of the health of students is paramount taking into consideration that the strength and well-being of a nation is directly related to its health. The nation's health is the sum total of the health of the people in its various communities and the health of the community depends on the facilities that are available to it. A university population especially that of the students can be classified as a community, and a very important community at that for the University students are a highly selected group on whose education the country invests large sums of money and therefore schemes to protect and maintain their physical, mental and emotional well being represents a valuable form of insurance to the country.

The majority of University students fall in an age group which is considered to be a psychologically difficult period of life. It is also generally accepted that emotional factors play an important part in determining academic success and that one of the major health hazards of the University student is emotional imbalance. A student health service, when administered well, not only helps to ensure graduation of students who might otherwise fail to complete their courses but can also serve as a source of health education. Health is important to each and every individual and is of greater significance in developing countries.

The Functions of a Students' Health Service

The functions of a Students' Health Service are:-

a) To prevent and treat minor and major sickness.
b) To administer counselling.
c) To impart health education whenever possible.
d) To provide dental services.
e) Health appraisals.
f) Referrals and follow-up services.

Prevailing influences on Students' behaviour.

The advice we give to students must be practical in terms of knowledge today and the motto to be adopted should be to give the students the full and whole life. Not only is there an expansion in the numbers of students but there is also an expansion in the number of courses and subjects studied; and new universities can have new aims, adopt new methods and endeavour to establish their own identity. This is quite obvious to us in this region especially in Malaysia and Singapore where we have many colleges and universities springing up to cater for the needs of the people and nation. All this expansion means increased need for medical care and attention, mental health and emotional stability.

Not only Universities have students, other centres of higher education too are expanding, especially in Malaysia where we have the MIT, the Islamic College, the Polytechnic and a number of Teacher-training Colleges and other such institutions. The function of these institutions should not only be to acquire degrees and diplomas but also to be critical of our traditional standards and values in an ever changing world. In this respect the University of Malaya is unique in that our student community is a multi-racial and multi-cultural society and hence it could create a lot of problems in the way of racial and cultural alignment. Our students come from a wide variety of racial and cultural back grounds. The cultures in turn have many sub-cultures with their own moral codes, standards and values. These differences coupled with the fact that the students are thrown together in the campus to learn and live together can create further problems beyond mere adjustment to living together. The social and emotional problems have to be handled very carefully and tactfully for the question of race, colour and creed too could be a very delicate and sensitive issue. Thus a healthful living condition is required and that calls for the provision of a safe and healthful environment and the establishment of interpersonal relationships, favourable to emotional, social and physical health. The objectives of a student health service should also include :-

a) The maintenance of optimum health and to provide the safety of the students.

b) To inculcate desirable health habits, attitudes and behaviour conducive to healthful living.

c) To promote a sense of security and contentment among the students.

University Health Services are influenced by individual local factors which we should be aware of and look at ourselves and our own ways to improve them.

Preventive Medicine and Psychiatry

In underdeveloped countries and in countries which have achieved independence recently, the government policies are dedicated to the

promotion of health, education and human skills. This dedication should awaken us to the fact that the most precious resources are people. This should stimulate the need for adequate psychiatric and counselling services to be tailored to the needs of each institution. Adequate psychiatric evaluation and screening of incoming freshmen and health services available for seniors must be provided by the university to prevent wastage of talents and human dignity which occurs through mental breakdown.

There is a great national awakening in Asia and the governments are thinking more in terms of national and economic developments for the welfare of the people and nation. — for before we were merely dependent trading centres. The students of today will be the leaders of tomorrow and if they are well taken care of, they would in turn not only be able to contribute to the economic development of the country but would also be conscious of the kind of health and welfare services that should be accorded to the more unfortunate citizens and would be wonderful change agents, so to speak. Accomplishment of such a goal may not be possible of individual or isolated Students' Health Services but never-the-less they can be fore-runners of such awakening in the nation.

The availability of health insurance coverage for all students, and the utilization of a panel of local physicians and hospitals may reduce the importance of a Student Health Service but I am of the firm belief that resorting to such facilities all together, is an easy way out and a short term policy to avoid or put aside the obligations and responsibilities of an educational institution.

I think that there is a great need for Students' Health Physicians of the region to get together to make a joint effort to contribute even more to a wide range of students even though the problems may not be exactly similiar. An association of the Asian Students' Health Physicians would be able to work out more positive health programmes for the benefit of the region and set out certain objectives like :-

a) To propagate the concept of a co-ordinated Students' Health programme.

b) To encourage joint projects for the improvement of the Students' Health Service.

c) To provide adequate facilities for carrying out health appraisals in learning institutions.

d) To encourage participation in research and to draw up standard methods of maintaining Health records.

Conclusion

In conclusion I would like to stress the very great need for the medical and psychological health and welfare of all students to be

catered for by Students' Health Service personnel. The students need a more intimate and personal service which is quite different from the type of treatment they would get from an out-patient's department in a government hospital. A psychiatric and preventive medicine programme would provide a healthy environment for the university students. Adequate counselling and psychiatric services should be provided to the university student to help him in his adjustment himself to the new academic and social environment.

A student health service is obviously a prudent expenditure and a medical evaluation on enrollment to an institution of higher learning would certainly help to plan one's academic career, if the presence of an unsuspected disease or potential disability is discovered at the start. It would also help to protect the campus population against contagious diseases which should be the responsibility of the institution. It also would help against placing students at a potential risk in athletics, laboratories, or on required field trips.

A medical and health evaluation upon enrolment in a University must not be interpreted by either the student or the physician as a screening procedure upon which eventual enrolment is dependent.

A demonstration of concern for health by an institution and the maintenance of health in the young adult embarking on an academic career in an institution would have a great impact for the better on an under-developed or on unconscious health-educated society.

I shall give you some facts of the existing conditions in the Students' Health Service of the Malayan University which is part of the University set-up and is staffed by :-

a) Two Medical Doctors
b) One Dental Surgeon
c) Three Staff Nurses
d) One Dental Staff Nurse
e) One Dental Assistant Nurse
f) One Laboratory Assistant
g) Three Attendants.

Payments

The students have to pay a fee of $9/- (Malaysian Dollars) per term i.e. $27/- per academic year.

The centre caters for the health problems of the students i.e. it takes care of curing and preventing diseases and tries to solve the social and emotional problems of the students. On admission to the University of Malaya a student is given a medical examination form

to be filled in by the students' personal physician, a private medical practioner or a Govt. Medical Officer with a chest X-ray attached. The forms are perused by the Students' Health Service and if any further investigations are to be carried out, it is taken care of by the Health Centre. In the event of any open cases of tuberculosis, the student is advised to continue treatment and is only admitted into the University when he is not considered a threat to the society.

Some of the major problems seen in the University of Malaya Students' Health Centre are :

a) Problems of a psychological nature like emotional, financial and academic problems.

b) Pregnancy out of wed-lock, it does not pose a very serious problem.

c) A fair number of cases of non-specific urethrites.

d) Some cases of tuberculosis.

e) Two case of mononucleosis.

f) Few cases of Hepatit's especially during Flu Seasons.

TABLE I

	No. of cases	%
Respiratory ailments	1,498	50.
Gastric Inessinal	405	13.5
Skin	411	13.7
Psycho Neurosis	120	4.
Anemia	115	3.8
Intestinal Parasitec infestating	23	0.8
Senito Urinary	66	2.2
Injuries Sports	100	3.3
Motor Vehicle Accidents	55	1.8
Ear and Throat	20	0.7
Eye	38	1.3
T. B.	4	0.1
Cardio Vascular	3	0.1
Metablic Disorders	1	–
Psychiatric	4	0.1
Dental	7	0.2
Emdocrine Disorders	2	0.1
Epilepsy	4	0.1
Pregnancies	3	0.1
Malaria	9	0.3
Medical Check-up	5	0.2

TABLE II

Shows the number of visits to the Students' Health Centre 1968/1969

	No. of Students		No. of visits		Per/ student visit		% of visits	
		63/64		63/64		63/64		63/64
Arts	2,332	870	8,235	1,455	3.5	1.7	42.8	35.9
Econs	781		2,600		3.3		13.5	
Science	1,038	384	4,155	999	4.0	2.6	21.6	24.6
Engineering	338	252	1,291	1,032	3.8	4.0	6.7	25.4
Agricultural	237	96	759	457	3.2	4.8	3.9	11.3
Medicine	510	40	1,650	62	3.2	1.6	8.6	1.5
Education	330	35	557	50	1.7	1.4	2.9	1.2
Total	5,566	1,677	19,247	4,055	3.5	2.4	—	—
Hostelitis			13,851				72.	
Non-Hostelites			5,396				28.	
Males			15,528				80.7	
Female			3,719				19.3	

In the academic year 1968/1969 there were 19,247 visits as compared to 4,055 in 1963/64. The student population being 5,566 and 1,677 respectively.

Recommendations :-

a) The Students' Health Service in Asia should provide facilities for the early detection of abnormalities, establish a system of referrals and follow ups and prevent and treat minor and major illnesses. It should also administer counselling and impart health education whenever possible and provide dental services.

b) A healthy university environment is essential for the proper physical, emotional and social development of the students. The aim of the institutions of higher learning in Asia should not merely be the acquisition of degrees and diplomas but the development of a well-rounded personality and stature. The students must be made aware of the purpose of education and regard extra curricular University activities which appear unrelated to passing examinations as no less important than those activities which have a direct bearing on academic achievement.

c) The Health education of the students in Asia should take the form of planned instructions, informal learning experiences or individual health counselling. The responsibility of the Student Health education should fall on the Students' Health Centre and thus a general health education course be formulated and introduced to the students.

d) The Asian University has a unique and potential role as a 'change-agent' in the community for the students who graduate would be in a good position to influence the society and community in which they live.

e) The Establishment of an Asian Students' Health Association for joint efforts to propagate the concept of a co-ordinated Students' Health Programme and to draw up standard methods of maintaining health records and to participate in research.

THE PROBLEMS AND CHALLENGES OF DENTAL HEALTH IN ASIAN UNIVERSITIES WITH SPECIAL REFERENCE TO ASIA

by

Subramaniam
Students Health Centre,
University of Malaya,
Malaysia.

Introduction

Health in its broadcast sense according to WHO definition is a "state of complete physical, mental and social well being and not merely the absence of disease or infirmity." As such the physical well being of an individual depends upon the health and functional efficiency of the entire body. Complete mental and social well being can only be attained when the individual is free from pain, debility and discomfort.

Dental Health which is often grossly neglected poses a pressing problem in the newly independent developing countries.

The teeth and supporting tissues are an integral part of the body. Healthy teeth are essential to efficient mastication which helps to assure full growth and development of the body and also helps an individual to attain complete social and well being by giving form and character to the face, personality and by promoting clear speech.

Dental disease which is the most prevalent disease of mankind today is more bothersome than dramatic. It is rarely cause of death yet it takes an enormous toll in terms of ill health and disability which results in loss of time from schools, institutions and other categories of essential services. The Dental problems seen among the students of the University of Malaya are the forerunner of the problems existing in the schools in Malaysia.

There are three factors in particular that must be recognised as far as dental disease is concerned.

a) Problems of dental health are closely bound up with those of general health and well being;

b) Dental disease is a public health problem;

c) Dental disease is a problem of all segments of society and all ages young, old and in between.

Main Problems affecting Dental Health Service

a) Staff
b) Incidence of Dental maladies

Staff

In Malaysia, there are about 150 Dental Officers and 400 Dental Staff Nurses employed to man the 458 Dental Clinics in the country situated both in the urban and rural areas. These centres provide dental treatment to school children and other categories of patients such as maternal and child health patients and members of the general public of the low income group who require emergency dental treatment.

With the school population of about 1.8 million out of the general population of 8.1 million and the growth of the population at the rate of 300,000 per year, it is evident that the school dental service will not be able to cover all the schools in this country. In fact, only 20% of the schools are covered at present. Because of the tremendous amount of untreated dental diseases and due to shortage of dental surgeons auxillary workers were introduced into the dental field.

Incidence of Dental maladies

In Malaysia, about 90% of the school population suffers from dental maladies in ranging degrees of severity. At this juncture, I would like to point the prevalence of dental caries among the urban and rural population :

	Dental Caries	**Periodetal Disease**
Urban population	90%	lower %
Rural population	60%	higher %

This is due to

a) Socio-economic factors
b) Poor oral care) ignorance
) wrong methods of brushing
c) Diet

It will be apparent that the high incidence of dental disease affecting the population especially the school children can only be reduced through preventive measures.

As the demands of the dental needs of the college students, school children and general public began to increase it was found that the dental surgeons in the government clinics could not render more than an out-patient emergency care to the students; as there are only 224 qualified Dental surgeons for a population of 8.1 million (within government and private sector, May 1967 Statistic) i.e. one Dental surgeon serving a population of 35,000 whereas the recommended population ratio according to WHO is 1:5,000.

Thus as the student population began to increase in the University of Malaya from 278 since the inception in 1957 to 7,769 today, it was found necessary to start a Dental Health Service within the Student Health Service and it started functioning from 1st June, 1970. The Dental Unit consists of :

1 Dental Surgeon

1 Dental Staff Nurse

1 Assistant Dental Nurse

1 Attendant

Dental Service presents a difficult problem in the University setting since some of its phases are of an emergency or preventive nature, fitting well with the other elements of student health programme, while some phases are not.

The common problems of Dental care are :

Preliminary Service

a) Dental Health education including nutrition

b) Palliative emergency treatment at first aid level

c) Preventive measures :

i) For the individual

ii) For the community (water F2)

d) Case finding

i) Dental examination

ii) Dental prophylaxis

Treatment Services

e) Diagnosis and treatment planning

f) Corrective Services

i) oral surgery

ii) orthodontics

iii) Periodontics

g) Restorative services

i) Operative dentistry

ii) Prosthetic dentistry

At the moment the Dental Service provides only emergency care, dental health education and some phases of restorative dentistry and

is unable to provide comprehensive oral health care due to lack of facilities in the present set-up.

About 94% of the student population in the University of Malaya campus is afflicted with dental caries. There is a minimum of 5 carious tooth per patient examined. Here is a cross-section of 500 cases seen at the Dental Clinic, Student Health Centre, University of Malaya.

Caries	470	cases (various stages of decay)
Caries free	20	cases
Chronic gingivitis	100	cases
Acute ulcerative gingivitis	5	cases
Vincents stomatitis	1	case
Dental abscess	25	cases
Cellutitis	5	cases
Impacted wisdom tooth	45	(mostly lower jaw : age roup 20-24)
Anterior fracture of teeth as result of motor accident	10	cases
Exostosis	1	case
Aphthous ulcer	10	cases) 6F) AM

In this respect, the University of Malaya is unique in that our student community is a multi-racial and multi-cultural society. The pattern of dental disease too varies to a slight degree among the different ethnic groups. There is a prevalence of periodontal disease among the Indian and Malay students as compared to the Chinese students. Also there is a prevalence of impaction of wisdom teeth campus students. This is due to either.

a) hereditary factor — small jaw large teeth
b) impact of civilisation — man has progressed jaw growth has regressed.

The Challenges in Dental Health lies in

a) Education
b) Preventive measures
c) Increase in Dental Personnel
d) Co-ordination

Education

In this context, there is no word more appropriate than Benjamin Disraeli's celebrated quotation "upon the education of the country the fate of the country depends." Educational activities should be concerned with informing the masses how dental health could be attained and preserved, how dental and oral diseases may be prevented and how dental health contributes to general health and to encourage them to transfer knowledge into action. Thus the functions of the institutions of higher learning should not only cater for acquiring degrees and diplomas but also should be critical in providing higher level of health care including dental health care for these students who would be leaders of tomorrow, would not only be able to contribute to the economic progress of the country but would also be conscious of the kind of health and welfare services that should be accorded to the less unfortunate citizens.

Preventive measures

In recent years, research has provided preventive measures which reduced dental caries considerably :

a) Fluoridation of drinking water.

Though it is not economically profitable for fluoridation of drinking water in Malaya as 60% of the rural population do not receive their water supply from reservoirs yet there should be a move for some sort of legislation towards fluoridation of drinking water in urban areas as this would reduce the % of dental caries remarkably.

b) Tropical Flouride application

Problem lies in insufficient auxilliary to deal with this aspect of dental service. Here lies the need of dental hygienists.

c) A balanced diet particularly during the teeth development, restriction of the intake of easily fermentable carbohydrates and avoidance of such foods between meals are well known preventive measures.

Increase in Dental Personnel

a) **Increase in number of Dental Surgeons**

As there is an acute shortage of qualified Dental Surgeons to meet the growing demands in the country there is an urgent need to establish an Institution in Malaysia to train qualified dental surgeons. At the moment there is one dental surgeon serving a population of 35,000 whereas that recommended by WHO is 1:5,000.

b) **Dental Hygienists**

This group of auxillary personnel are essential as they compliment the dental surgeon in carrying out preventive

measures effectively. Besides training Dental Nurses in Malaysia, they should also train dental hygienists.

Lastly the need for coordination

The battle for dental health cannot be won by dental service alone. If dental diseases are to be prevented, attention must be given for care of the teeth by teachers, medical and para medical personnel. In particular, obstetricians, paediatricians, public health officers, health visitors and midwives should work in close co-ordination with dental service in the prevention of dental diseases.

Conclusion

I would conclude by saying the important problem of dental health care must be concerned with purpose, to inculcate in every individual the importance of preserving functioning, aesthetically pleasing, natural dentition, for life.

I would take this opportunity to say that there should be a Regional Research Centre established to cater for research into dental health and its allied problems and oral diseases peculiar to this region which would be of mutual interest and benefit to this region as this can lead to better dental health care.

SUMMARY

a) Problems of Dental Health seen in the University of Malaya are the forerunner of problems existing in the schools throughout Malaysia.

b) Establishment of an Institution to train qualified dental surgeons and train other category of auxillary dental personnel i.e. dental hygienists.

c) Legislation to provide for fluoridation of drinking water in urban areas and later to rural areas.

d) Education of the masses to be conscious of Dental Health through mass media.

e) Establishment of a Regional Research Centre in this region to cater for dental health and allied problems and oral diseases.

PART II

THE UNIVERSITY & ITS CURRICULAE

THE HUMANITIES AND UNIVERSITY EDUCATION

by

M. C. Greenfield
Faculty of Arts,
University of Malaya,
Malaysia.

Writing in 1963, Noel Annan, then Provost of King's College, Cambridge, defined the distinguishing quality of universities thus :

> The intellect. That is what is what universities are for. Everything else is secondary. Equality of opportunity to come to the university is secondary. The need to mix classes, nationalities and races together is secondary. The agonies and gaieties of student life are secondary. So are the rules, customs, pay and promotion of the academic staff and their debates on changing the curricula or procuring facilities for research. Even the awakening of a sense of beauty, or the life-giving shock of new experience, or the pursuit of goodness itself – all these are secondary to the cultivation, training and exercise of the intellect.

I won't pause to consider how acceptable a recipe this is for universities in the United Kingdom (to which Annan was no doubt referring). It is quoted here because it seems to me a staggeringly irrelevant description of the function of universities in Singapore and Malaysia – where I have gained my own brief experience – and, I suspect, of many other Asian universities.

Whether they like it or not, universities in developing countries are primarily the servants of their community. I don't mean to suggest, of course, that these institutions have no concern for the life of the intellect. There is much research work, and there are plenty of dedicated teachers and gifted students, to show that they do. Abstract intellectual effort is the bread-and-butter (or rice-and-curry?) business of university teaching – lectures, tutorials, examinations. Can it, though, be the main purpose of a university in Asia today?

In countries which lack skill to tap their natural resources, which lack qualified teachers, administrators and professional men, where great wealth and abysmal poverty rub shoulders, in countries divided by religions, cultures and languages, where loyalties are ethnic rather than national, where racial groups harbour deep fears of and resentments against each other, in countries which face both internal and external threats to their stability, where disturbance of the political equilibrium can cause sickening violence : in countries, to sum up,

which seem to have an insecure grasp of their own future – in these countries, blithe talk about cultivation of the intellect sounds like criminal lunacy. Cultivation of rice is a worthier task. Neglect of the need for "equality of opportunity to come to the university" or of "the need to mix classes, nationalities and races together" may result in there being no university. A university's duty, under circumstances like these, is to the community first, to the life of the intellect thereafter.

Given such an assessment of the university's responsibilities, my aim in this paper is to consider what part, if any, the humanities can play. It is not hard to see how the sciences (pure, applied, and social) or how professional and medical studies are relevant to the problems of kaleidoscopic change in Asia, because these disciplines are vital in vocational training and also because the fruits of their research frequently have direct utilitarian value. But what social purpose does the study of philosophy, literature, or history serve? It doesn't increase the GNP or reduce unemployment, eliminate cholera or Colorado beetle, build bridges or demolish racial tensions; these disciplines are not problem-solvers or dollar-earners, nor have they any ability "to make two ears of corn or two blades of grass grow upon a spot of ground where only one grew before." Sometimes one tends to feel that they remain on the syllabus as a kind of sacrifice to the gods, a deliberate offering up of time, energy and money in appeasement, so that the really useful business of life, the pursuit of tangible advance, can go ahead unmolested.

Of course there are certain practical benefits to be gained from a study of the humanities. Skill in the handling of complex and abstract ideas, familiarity with the most subtle and delicate ways of using language, and awareness of the historical background to the country's present problems – these accomplishments are important in the training not only of teachers and administrators, but of any student, no matter what his specialisation, who hopes to make his abilities socially useful.

Perhaps, also, some degree of understanding is achieved by studying the language, literature, history and culture of other groups in the community, although I think the effectiveness of this kind of "catalyst for social sympathy" can be overrated. It is either a matter of teaching the converted, or else of confirming the prejudices of the unconvertible; and in any case leads to the de-escalation of social hostility no more logically than does a multiracial durian feast (even if it is kinder to the digestion).

But as a practical demonstration that the nature of a humanities training is essentially non-practical, I want to offer an illustrative example; and I make no apologies for drawing one from my own discipline, English Literature.

E. M. Forster's novel "A Passage to India" appears frequently as a set text in English Literature courses. It concerns the British in India in the early years of this century. Isolating "attitudes" from any

work of creative literature is a destructive occupation; but here, tentatively proposed, are some of Forster's : he shows that inter-racial tensions, particularly when reinforced by a power structure, are cruel and brutal in their effects, but probably inevitable. He severely criticises the hardened, inhumane attitude of the British administrators, who, as one of them says, "have not come to India to be pleasant to the Indian." But he shows that the sympathetic Englishman, who believed in "good-will plus culture plus intelligence" and "kindness, kindness and more kindness" in his relations with Indians, finally failed (although honourably?) in his attempt to bring about tolerance and understanding – and was even partly responsible for precipitating hostility and communal hatred.

"Passage to India" is, I believe, a very great novel; but as a practical handbook or administrator's *vade mecum* it is worse than useless. A man who tried to guide himself by the values of this book would be paralysed if he were ruling British India, or any other country. A politician's, an administrator's, a business man's duty is to search for simple answers, and to try to hide embarrassing complexities; the creative artist's duty – and by analogy, I thing, the student of the humanities' duty – is to face up to and investigate the embarrassing complexities of life, and to mount an attack on simple answers.

Some may see this as an indication of the unfitness of the study of the humanities as a means of educating young people to cope with the flux of life in Asia today; I believe that it indicates the importance of that study. In his Inaugural Lecture last year, Lloyd Fernando, Professor of English in this University, argued that

> Literature will last as long as people put words to paper and as long as people speak, because that is how long people will need the sustenance of the talented few with the skill to indicate to the layman ways of not being carried away by false prophets, ways of remaining integral.

The study of literature, like the study of the other humanities subjects, leads to contemplation and to criticism rather than to action; at best these studies lead to a fuller and deeper awareness of the intricacies, the pleasures and pains, the possibilities of human life.

Teaching the humanities is not, then, simply fiddling with the intellect while Rome burns. If it is any good, it serves the social purpose described by Lee Kuan Yew – that most anti-intellectual of Asian intellectuals – as the vital task of the university :

> To lead thinking – informed thinking – into the problems which the nation faces.

Yet the thinking about social and political change which it provokes is unlikely to be of a kind which would please him, for it is likely to

be sceptical in outlook. It need not necessarily take the tone of Samuel Johnson, who gave it as his opinion that "most schemes for political improvement are very laughable things". Yet it must surely ask the questions which are so rarely asked in developing countries, and even more rarely answered.

It must doubt the doctrine which holds that material progress is synonymous with advance in the quality of life – a doctrine which is unfortunately gaining adherents in Asia at the very moment when it is losing them in the West. It must ask whether "modernisation", "development", increased national prosperity, industrialisation, better communications, more efficient political control, are inherently worthy goals; and at what cost they will be achieved. It must consider whether change in Asia is not simply, for many millions of people, the exchange of one kind of squalor for another. This thinking will want (responsibly) to question fundamental accepted facts of national life, since if they are never questioned, they do not deserve to be accepted. It will want to carry out a moral and spiritual cost-benefit analysis – to know in what direction the wind of change will blow, and whether it will blow anyone any good.

My argument is that a training in the humanities can, or should, help to bring about this sort of perspective, not as a result of any indoctrination of the students, but because of the nature of the material which they study. Taketoshi Furomoto, a lecturer in English Literature at Kobe University, discussing the teaching of literature in Asia two years ago wrote :

> Through study of a foreign literature one can learn different views, different opinions, humility and wisdom. One comes to know and to understand that everywhere and in every age man suffers the same problems, and that to those same problems there are many different solutions.

This seems equally true of the study of history and philosophy. Politicians and administrators have their eyes upon the present; creative artists, philosophers and historians see both the past and the present, and, because they hope that what they write will survive, they try to see the future too. They help those who study them to judge the quality of the present; to be aware of the merits and the deficiencies; and through judgement and awareness, to play a fuller part in national life and debate.

In trying to show that the humanities subjects earn their place in university education by serving the community, albeit in oblique ways, I have stressed their role in stimulating "informed thinking" and discussion about national problems. Now I want to shift the emphasis slightly, to add a caveat rather than an argument.

A community is made up of people, and students are people; in serving its students, a university is serving the community. It does

not do this by trying to turn out "effective digits for the community", but by cherishing the individuality of its students, by preserving the spirit of human singularity, however eccentric it may seem, against the forces which would squeeze it into conformity.

And further, it does not serve its students by offering them knowledge, but by offering them comprehension,or at least the means to gain it. Our world is desperately fragmented; and the increasing difficulty which the individual faces in his intellectual comprehension of that world has coincided with the withering of the various means – religious belief being the chief one – which enable him to comprehend it emotionally and spiritually. Thus a vastly increased burden has been placed upon education, which must now be a force enabling the student to deal with the whole of his life, to discover for himself patterns in an apparent chaos, and to relate together in some personal synthesis the disparate elements of his existence. "To see life steadily, and to see it whole."

It would be foolish to claim for the humanities a monopoly of these vital functions of university education. And yet, because they consider life in its fullness and complexity, because they concern themselves with the actions, ideas and feelings of individuals, because the raw material of their study is inescapably human, their influence cannot be replaced or denied.

The whole of the argument for the humanities is summed up best in the words of F.R. Leavis :

> It is the **raison d'etre** of a university to be, amid the material pressures and dehumanising complications of the modern world, a focus of humane consciousness, a centre where, faced with the specialisations and distractions in which human ends lose themselves, intelligence, bringing to bear a mature sense of values, should apply itself to the problems of civilisation.

RELATIONSHIP BETWEEN UNIVERSITY AND INDUSTRY

by

J. L. R. Kirkaldy,
Faculty of Science,
University of Malaya,
Malaysia.

Whether we like it or not we live in a technological age, an age in which there is an ever increasing demand from the general population for the good i.e. material things of life. This demand is present in developed and underdeveloped nations alike. The question whether this demand is a result of technological advances or technological advances are a result of the demand is a moot point which sociologists could debate for hours, if not for weeks. Whatever the driving force, rising standards of living within a nation are always accompanied by increased industrialisation. This industrialisation is dependant on new knowledge formed by, and existing techniques modified by, applied scientists. Since the products off these industries are year by year infiltering to our homes and occupations in ever increasing amounts, our lives becoming more and more conditioned by, and dependant on, engineering or applied science in general.

Consequently, applied scientists through industry indirectly wield a very great and growing power over human lives. Power in itself is neutral, it can be used consciously or unconsciously, for good or for evil. Few people in the world today are unaware of the destructive power of the nuclear bomb, but technology can and does influence our social orders in many other ways. For example the introduction of automated machine tools to the motor car industry has resulted in a considerable reduction in the labour. No longer as in the 1930's does one man carry out one operation on one machine. Today one man can operate 2 or 3 machines which carry out several operations. Such innovations need not create permanent unemployment but will undoubtedly cause changes in the way of life of those concerned and perhaps some temporary hardships.

In earlier societies of the Western world and in the present less sophisticated countries, the business of earning a living was by and large a matter of handing down, from father to son, traditional knowledge and skill. As a result, a particular form of society evolved, based on respect of the younger generation for the old. However when technology may and does change these skills once or twice within a single generation, society must change with it. When one no longer learns the essential facts from our elders but from the

laboratory, the experiment in the field, by deductive reasoning, then plainly the value of tradition and experience is profoundly altered. To my mind this may be a contributory cause of the unrest amongst the student population so prevalent in Japan, America and Europe.

Not only are peoples' ways of life affected, but also the environment can be altered. A river may be dammed to form a lake and the waters used to make fertile a desert as the Aswan Dam or to increase cropping as in the Muda Scheme here in Malaysia. Both are immensely valuable schemes, but is for example, the wholesale felling of forests so beneficial in the long run ? With increasing industrialisation the potential for pollution of the air and the waterways increases. In S. E. Asia pollution is not yet, as far as I am aware, a serious problem, it need never become one. Good engineering, good industrialisation and good government can ensure that it never does.

What is then the relationship of a University to Industry ? How can and should the Universities influence industrialisation ? How does industrialisation affect the Universities ?

In the first place the Universities are the source of the skilled professional man power of industry, which is, after all, no more than a committee of professional men, of scientists, engineers, accountants and lawyers. A committee which has broad executive powers to make decisions and bring them into effect, with, as we have seen in many cases, far reaching results. These decisions can be no more wise than the wisdom and knowledge of the individuals concerned, can permit. Consequently it follows that the training and education of the potential industrialist given in any University should be, ideally, of the highest standard available throughout the world.

However it is easier to say this than achieve it in practice. High standards, particularly in scientific and technological education involves heavy capital investment in equipment and the buildings and ancilliary services which go with it. For a poor country this may prove to be a heavy financial burden but it is the price which a developing nation must pay if it is to advance technologically. But at the same time every effort should be made by the Universities to optimise this expenditure by good planning.

The course contents of the technological and science courses are of course largely governed by academic standards and professional requirements. However I believe that after taking basic courses in appropriate subjects a certain amount of choice be available to the senior student. Furthermore the courses should be slanted towards, and illustrated by examples from local Industry. In any undergraduate course there must be selection of the topics covered and Universities must review these from time to time. It is worthwhile to consult with local Industry at these times. It not freqently happens that say A & B are equally worthy of inclusion in a course on academic grounds.

It is only prudent to choose the one which is likely to be more useful in after life for the student.

For engineers and applied scientists the academic content is however only part of their training. During their professional career after leaving University the young graduate will have to solve real problems, rarely with the right amount or data as presented in an examination question. Usually there is a bewildering amount of data available some of it even contradictory or else there is insufficient. In which case either a judicious selection must be made or intelligent guess work employed supported by some experiments if possible. It is extremely difficult if not impossible to produce such a situation in the classroom.

To take an example from my own field of Chemical Engineering it is quite easy to set in the classroom a design of a distillation unit. But in real life one would do this only as a preliminary step to building it. This, in turn, is however dependent on local conditions. Do we build it pointing north-south or east-west ? Where are the existing services; what happens to the products of the unit ? What happens if an existing plant is modified ? All these questions and many more may alter the original premise of the problem, resulting in several possibilities from which a choice must be made, usually on an economic rather than engineering basis. The classroom problem on the other hand nearly always gives a unique 'correct' answer. One of the most difficult things an undergraduate has to learn that in a real problem there is no correct answer, there are several answers some of which are better than others.

For the engineer then it is essential, and for the pure scientist desirable, that they should undergo a period of industrial training. A period of this nature is of immense value to the undergraduate, but the programme must be well planned. In addition the work must be meaningful to the Company concerned. In the Chemical Industry for example asking a student to check the plant efficiency is often a useful training problem. This gives the student a chance to use his ingenuity to obtain the necessary data to get information from people ranging from senior engineers and accountants to near illiterate labourers and to gain experience in making decisions.

From Industry's point of view, useful information is obtained at relatively low cost, at the same time it can serve as a recruitment exercise.

It can be argued that, in the case of the pure scientist, the student can obtain a better practical training in a well equipped University laboratory than in the laboratory of an industrial organisation whose equipment although no doubt modern, is limited to the specific requirements of the Company. This is true but it is one thing to carry out the analyses of say Palm Oil in a University laboratory but quite a different matter to carry out the same analyses on a sample of a bulk shipment to Europe in the knowledge that the

results of the analyses has a bearing on the costing of the cargo worth something of the order of $1,000,000.

In other words a period in industry serves to mature the undergraduate, to build his self confidence and bring home to him the harsh economic facts of life.

All these remarks have been directed at the scientists and engineers. What of the Economics and Arts graduates who intend to join Industry ? I believe that the same situation prevails except of course the field of operation would be suitably modified.

All these may well put a severe strain on the local industry, indeed it may be beyond the capacity of the resources available. One cannot generalise on how the available resources should be shared out, but personally I would give priority to the engineers. This is perhaps hard on the Economics and Arts graduates but as an alternative should not these students be offered a course in General Science ? Much criticism was levelled at the technical colleges and technological Universities of Britain because they had no Arts faculties. "If Universities are to educate for life how can graduates of these institutions claim to be properly educated when they have no opportunity to gain some knowledge of the Arts ?" was the cry.

The argument was accepted and courses in the Liberal Arts instituted. However the same type of argument is equally valid for the graduates from faculties other than science and engineering. Since these subjects have as we have seen such a profound infuence on the world today, a graduate should not leave University without some knowledge of the Sciences. Some of my scientific colleagues argue that it is not possible to discuss scientific topics with students whose last contact with Science was at Form III — they have no vocabularly. I do not agree with this, the intellect of the Arts graduate is just as keen and receptive as that of the young scientists. After all, since when did lack of vocabularly prevent a sailor in a foreign port from obtaining the services he wants ?

But this is a digression into a field which may be debated elsewhere during this Congress.

I have tried to show how Industry and the Universities can collaborate at undergraduate level. However, it is at the post graduate level that collaboration is likely to be most fruitful. In a University there exists the greatest concentration of intellectual knowledge, and equipment that a nation possesses. Few nations can afford not to channel some of this potential to developing its national resources.

Harnessing this potential can be done in several ways. Probably one of the most effectively ways is to set up a research and consultative group to serve a group of industries.

While industry is developing, the individual units are likely to be small and incapable of financing their own research and development groups independently of one another. The Government may set up such a body but this frequently means duplication of equipment already available within the Universities. For example we are, in this University, actively engaged in setting up two such groups.

One group is to concern itself with pollution problems particularly water pollution. Here is a problem which covers a wide range of disciplines, microbiology, zoology, botany, public health, chemistry and engineering. It affects large organisations and small organisations alike and the general public. Furthermore the mixing of effluents may have unexpected results at least if factory B is unaware of the nature of the effluent of factory A. Hence it is desirable to have a coordinating body aware of the problems of the different factories.

The second group is to collaborate with the Plastics Industry, giving advice on the suitability of raw materials and equipment and to carry such testing as may be required. Here the situation is slightly different. The Plastics Industry of Malaysia is composed of relatively small companies who have been operating for a comparatively short time. Good experienced technologists in this field are in short supply throughout the world, testing equipment is expensive and, in a small company, would probably be under-used. The University already possesses a fair amount of suitable equipment which would be somewhat under-used if employed for teaching purposes only. It is only logical then that this equipment should be put at the disposal of the Industry. Such projects, while easy to conceive, must be made to work in practise and this involves the problem of the provision of floor area, staff and finance.

One cannot present ready made solutions to these problems; each must be solved in its own context. As far as floor area is concerned, the two projects I mentioned earlier have benefited by a new building becoming available. However this is exceptional and adequate industrial — type floor space is unlikely to be always immediately available. This should not prove insurmountable. a lot of valuable work can be done in a student's normal working bench space. I find it hard to believe that this cannot be achieved. The important point is to find a small area and get started on work that can be done. Then better facilities will follow, sometimes surprising quickly with some backing from Industry, especially if the initial work shows promise of producing results.

Staffing in the early days must inevitably come from the existing University staff sided and abetted by undergraduates and laboratory assistants, perhaps if you are lucky an M.Sc. student. No doubt this will prove a burden on the staff to begin with, but if the position is explained in the right way to the staff, the vast majority will respond cheerfully to the challenge.

Financing such a project also depends on local conditions. Usually a guaranteed contribution from industry underwrites the salaries of any staff employed full time on the project. This makes appointment of staff much easier, a task which is further simplified if a young graduate can obtain a higher degree as a result of his contribution.

For initial capital outlay, a Government grant is very useful but Treasuries throughout the world are notoriously tight fisted and obtaining such funds may well prove to be the most difficult part of the project. The contribution of the Department concerned may be obtained by setting aside a proportion of its annual grant and/or by allowing the group to draw on its stocks of consumable items, a valuable privilege in areas where delivery of, for example, laboratory glassware may take 2 — 3 months.

But these are major problems where the need for collaborative investigation is fairly easy to see. There remain however many minor problems within a company, problems which a company have come to accept as almost a way of life, but which nevertheless are capable of being alleviated if not eliminated. Few of these problems ever come to light for the Universities to solve.

The blame, if blame is the right word, for this state of affairs probably rests with both parties. It might never have occurred to Industry to ask for help or if they did to reject the thought on the grounds that some trade secrets may be allowed to escape. The latter is a perfectly valid objection, but any consultant is governed by a code of ethics similar to that of the medical profession which prevents him from revealing his client's secrets to another. As a further safeguard a contract with a secrecy penalty clause can always be drawn up.

On the other hand University staff especially the young members tend to avoid taking on this type of work. Unlike a long term project, trouble shooting interrupts the University lecturers' teaching and research programme. Since the promotion of a young lecturer depends largely on the number of papers he has written, any non-teaching work which offers little prospect of a publication is avoided.

This attitude is very understandable. Any fees payable by Industry are unlikely to compensate a lecturer from being held "at the bar." Consequently it is up to the University authorities to give due recognition of this type of work. Since publication is difficult and may be expressly forbidden, a statement that Dr. X has carried out successfully an investigation should be accepted in lieu of a published paper in a promotion exercise. After all, the promotion board should be trying to determine criteria to judge the professional competence of the lecturer, what better tangible evidence can the candidate produce of his competence than a practical solution to a practical problem?

But this does not establish the initial liason between Industry and the University. Much of the responsibility for this rests with the

senior staff of the University who should make it part of their duties to find out what goes on in the local industries, to tell them what facilities the University possesses and how they may be applied. In my experience a company always welcomes a visit from University teachers and a tour of the factory followed by a chat with the senior management can pay excellent dividends with regard to both student training and possible collaboration. This positive approach is more likely to produce collaboration than for a technical manager to ring up the University and ask have you got such and such, only to be told quite truthfully no we don't. He hangs up muttering profanities about the uselessness of the University and disinclined to try again.

The Industrial training periods for the undergraduates can also be made into useful points of contact. Preplanning of the training should give the lecturer some insight into the company and follow up visits to the students during the course offer further opportunities for discussion on fields of mutual interest. Questioning of the student will often reveal short-comings in a process. The student brings a fresh mind with no preconceived ideas, he has inevitably been dealing with idealised situations in the classroom and is only too quick to spot situations which fall short of the ideal. It often happens that these areas contain fruitful problems.

An alternative approach is for the University to appoint someone specifically to visit industrial establishments with a view to establish collaboration. However the man for this post must be carefully chosen, the wrong choice might well do irrevocable harm. I doubt if it is a suitable post for a young graduate. An elderly industrialist recently retired, but with useful contacts, might be a better choice especially if the links between the University concerned and its local industry are yet to be formed.

All this may be taken to mean that I am advocating that the Universities should abandon fundamental research work, far from it. This has been and always will be one of the main functions of a University but it should not be used as an excuse for the University shutting itself off from its enviroment. The University is part of the community, it must be seen by the community to be so.

NOTE ON INDUSTRIAL TRAINING

It is difficult to lay down precise rules governing the training of undergraduate Chemical Engineering/Technology students within industry. The following notes are the result of the twelve years experience of organising and administering such schemes in U. K. and may form a guide for a similar project in Malaysia.

i) Students should be allocated as far as possible to the type of industry they would prefer to join after graduating

ii) Some companies accept students solely on the recommendation of the University Department. While this may be

flattering to the Department it is not in general good practice, an interview between student and prospective employer is well forth the trouble.

iii) Salaries paid should be comparable or preferably identical to those paid to junior employees in skilled occupations within the organisation concerned e.g. laboratory assistant.

Approx. U. K. scales at age	18	£10/week, ($300/month)
	19	£11/week, ($325/month)
	20	£12/week, ($350/month)
	21	£13/week, ($374/month)
c.f. Hons. graduate		£25/week, ($735/month)

iv) Students should be governed by standard service conditions and discipline. Suspension and/or dismissal included. The University would appreciate prior warning of an impending dismissal. (It has happened once in my experience)

v) Working programmes should be agreed beforehand by personal discussion between the employer and University staff. Such schemes are not to be regarded as inviolable and should be modified as and when necessary.

vi) The development of the managerial potential of a student is as equally important as the development of his technical knowledge. To this end a project which involves the retrieval of information from all sections of the company/ factory does much to break down shyness and helps to develop diplomacy. The project should also be meaningful to the company e.g.

A CO_2 balance round a large brewery.

Thermal efficiency of a crude oil distillation unit.

Cooling water consumption.

The last revealed an unsuspected leak in the cooling system and resulted in a 10% saving in water. The company concerned considered this well worth the outcry in the local press when a local trout stream was dyed a vivid green by the tracer injected into the cooling system by the system.

vii) A period of up to 12 weeks in the workshops or with a maintainance gang as a tradesman's mate is often beneficial. It gives the student a chance to observe the problems of maintainance at close quarters-corrosion, wear, poor design

(e.g. the necessity to remove a roof section in order to retube a heat exchanger), and internal fabrication of equipment. Also it gives him a chance to mix with a group of people whose outlook and standard of intelligence is different to what he has been used to, but for whom in later life he will be responsible. If tradesman hours are different to staff hours the student should work tradesman hours on shift if need be.

viii) Suitable reports should be submitted by the student on all aspects of his experience. These should be submitted to the employer for onward transmission to the University; thus secrecy of technical matter can be maintained if necessary. A high standard of reporting should be demanded.

ix) Every effort should be made to develop an inquiring attitude of mind in the student. The University can do a lot to this end before he joins industry by suitable teaching methods.

x) A training scheme is often no better than the students' immediate supervisor makes it.

xi) University staff should visit the student and discuss progress with him and his employer. The first visit within 6-8 weeks of his joining and subsequent visit depending on the length of stay.

CHANGES IN OUTLOOK OF TRADITIONAL SCIENTIFIC STUDIES AND THEIR POSSIBLE INFLUENCE ON THE S. E. ASIAN TECHNICAL ADVANCE

by

J. F. Ward,
Faculty of Science,
James Cook University of North Queensland,
Australia.

Scientific studies in the Western countries have been traditionally the province not only of universities, but also of a diversity of professional examining and standard setting institutions. These latter have in the main risen in response to sociological pressures or from craft-guild associations. Their historical background has left an imprint – seemingly impossible to eradicate – on the whole character of both the type of studies and of the image of science within the community at large. It will be appropriate to examine this fact later, but before doing so, it is necessary to comment on the general change in the tertiary educational setting in general, since this is shared by all disciplines of study.

Emphasis on welfare by the state and on equality of educational opportunity by all, has produced in western countries over a period of two to three decades, at least a new outlook – believed to be an achievement – in which most young scholars can contemplate at least the possibility of a tertiary educational training. Access to these establishments is now largely open to all sections of the community, and the social mind accepts university training as the norm for the majority instead of, as previously, the privilege of the gifted – or alas, the monied. It is important to recognise the excessive emphasis which now exists on the social status attached to a university or college of advanced education training with degree or diploma, and to reflect that this intangible of the social scene generates most of the pressure on governments to extend these activities and facilities. A direct result of this outlook is that today, the western university tends to be larger than formerly, and as a result to be more impersonal in its handling of students – they are in fact "numbers of students" rather than "groups of scholars." During this period the students themselves have undergone a distinct change in that the majority now aspire to derive some qualification and to the satisfactory completion of a programme of study. Less frequently nowadays, does one find the student who has earned his way to a university in order to fit himself for a profession or career in a field of his own choosing. The time of commitment to the avoca-

tion of life nowadays, seems delayed from the teenage prior to training until after a training when some oulet for this training must be sought. There are still student lawyers, engineers and medicals, who have clear intentions and know for what they are training themselves. They are outweighed however, by large numbers of physical and social scientists and students of the humanities, who are just hoping something will turn up, as an outlet, at the time their courses are completed. All this of course, makes a big difference in the general outlook to study, in attitudes towards staff and teachers, and incorporate activities of the student body. That the problem is real and has to be faced is evidenced by so many events and disturbances in western universities, and to some extent in eastern universities also, in recent years. We need to recognise therefore, that involvement in such a scene has an effect on both the teachers and on the educational institutions they are serving. One cannot read Thompson's "Warwick University Limited" without an acute awareness of the tensions all around now building up in the modern university community and amongst its sponsors – whether they be private organisations or governments.

It is true that the professional schools of education as in medicine and engineering have resisted — mainly by the weight of their own traditions — too rapid a modification but nowadays even their own futures are less and less predictable in the face of social welfare demands, or in the light of changes in interest of the student body. It is a significant warning to note how much of the apprenticeship for industry organisation of British operating countries has disappeared over a course of a couple of decades. A product of the craft system built up over centuries disappearing within decades. When the more specifically scientific and technological education of the west is examined, it must be done so in the light of its origin in the Renaissance learning, a freeing from medieval superstition and an assertion of man's freedom in the realm of the mind as well as of the body. With this freedom came humanism, and in due course mechanistic concepts were implanted into an optimistic, scientific advance. In Europe, this was often associated with the well-bred and the monied or, as in the case of the court scientists (rather perhaps alchemists) with a social class and later in civil engineering, with an officer classelite. In Britain the craft guildsmen and the technicians figured so largely in the industrial revolution, that a far more democratic setting existed. Many of the men involved were innovators who, despite little rigorous training. had remarkable success because the opportunities to apply their ideas were so widespread – a situation not unlike that of some developing countries today! It is not surprising that we find therefore, a place of higher esteem afforded to scientific effort and technological excellence in Europe than, for example what exists in Britain and perhaps in Australia and New Zealand today. In fact all the evidence seems to indicate that the contemporary malaise in science in Britain has such an historical explanation. America seems to have escaped both the aristocratic and plebeian extremes, and to have been able to develop a scientific excellence based on results and rewards with little evidence of associated sociological pressures.

In passing it is worth noting that so strong were the growing pressures in the western world, that its science grew up seemingly oblivious of the traditions of the east. Certainly some background was drawn from the mathematicians of Arabia and Egypt, but in the main the eastern maturity in explosives, paper making, painting, navigating, drug preparation, printing, and astronomical observing was largely unknown or unheeded. If not the content, then certainly the eastern attitude towards these scientific disciplines, would have been a useful point of reference or an anchorage in the helter-skelter of a so-called advance the direction of which the west only now is beginning to examine and even question.

It will illustrate the growing dilemma of our technological age if a few specific factors relevant to tertiary scientific education are now discussed.

In Britain, the so-called College of Advanced Technology was set up in the 1950's most deliberately to yield a supply of scientifically trained and inclined person. From their earliest years they broadened their interests however, and humanity type subjects began to appear in the curricula and research programme grew more widely than was envisaged. Within a decade these very same colleges, or their re-named descendants, were producing an increasingly large number of graduates in the humanities – as disinct from the sciences – with the result overall for Britian that despite the best legislative steps to the contrary, the numbers of graduates in cultural and social fields were outstripping those in science. In fact, this situation concided with a sociolgical swing away from the study of the exact disciplines like physical science and engineering – a trend which persists to the present day. Almost as a response to this demand basic text books at senior school and at first year university level increasingly reflect a discussional, descriptive emphasis with great effort put into pictorial display and illustration. All the most interesting and inspiring aspects of a Science are freely displayed and students are encouraged to discuss a very wide range of scientific concepts. This they can do without rigour or critical analysis – often in a popular science manner – and the result is that later the university task of seeking really to understand the fundamentals appears a dull and dreary and perhaps, quite an unnecessry chore. Another aspect of this process is programmed learning where knowledge is compartmentalised and students appear as the recipients of a pre-digested corpus of factual data, a process now even extending to laboratory practise classes where experiments are performed in step with a leader almost like in orchestra with its conductor. It was inevitable that the wide availability of computers would introduce new outlooks in students and has led to those who use computer studies as a form of insulations between concept and field trial. It is increasingly difficult to encourage those engrossed in such studies to see that eventually the design, or the method so elegantly devised, must also be shown to be in fact practicable, and to be capable of yielding an actual improved result. Like the machine tool of industry, the capital outlay in the computer must be proved to increase productivity and not merely to contribute to the personal satisfaction of the user.

It is not surprising in environment of the type discussed, that the personal link between the teacher and those taught becomes vague. One first year course in physics in the University of Sydney (Australia), for example, consists in teaching about 1400 students entirely by closed-loop TV, and video tape techniques. The Open University of Britain goes to the logical ultimate in this trend in offering full university degree courses largely by special radio and television broadcast techniques.

Another manifestation of changed emphasis is the growth of the so-called systems engineering courses in engineering faculties. The logistics of the manipulation of men. money, materials and time becomes the main objective, and to others is to be left the seemingly unimportant and lesser task of bending the knowledge of science to the solution of the technical problem. The question to be asked however, is, who will be content in the furture to handle the harder, the less glomourous but the more basic task of engineering the project to the successful technical conclusion upon which profit and safety and health, and many other things depend for the community.

The confirmation of the result of such trends in technology today comes in the new look in examining and testing procedures. As for compartmentalised knowledge, so comes sectionalised and piecemeal testing, check lists, even continuous assessment — any method to reduce a sustained examining situation when a body of knowledge, believed to have been apprehended and appropriated, comes under review. The modern examination methods may heen the susceptibilities of the students, but they often do not accord with the pattern of testing one faces as a reality of life, or in the struggle for commercial survival or success, or for community acceptability.

In the light of trends such as these — and others could be mentioned — it is not surprising that one of the most effective industrial physicists and leaders of research of our time — Dr. H. B. Casimir of the Philips Research organisation of Holland — has voiced serious misgivings about the scientific — social situation in which we are placed. Casimir contends that in a period of fast evolution such as has characterised northern and central Europe and America, insufficient stock has been taken of the true extent of the changes which have been wrought and are still taking place. Or, having attempted to assess these, due note is not taken of the predominant effect of a "science-technology spiral" inherent in the changes. Furthermore, those who have been observers of these changes have included many who, rather than being comforted and pleased, have become alarmed at the alliance between the physical sciences and technology. We are faced therefore, even in the midst of our vaunted progress, with the problems, — perhaps by far the most important problems of demanding of physical science some solution to the stresses it has introduced into the community and into the world situation. Economic productivity, and so national wellbeing, lives historically by the grace of fundamental science. However, it is not only that practically every innovation is

based on previously executed fundamental work but that, turning the fact the other way round, practically every piece of fundamental work carried out ten or twenty years ago, has led to a new application in some way or other. If then this feeling of unease, yes, even of alarm exists, if scientists and politicians and the thinking person can no longer discern what is progress, it is high time we took stock of our present tertiary educational situation.

As a country of some apparent industrial promise, and as a near neighbour to the south east Asian lands, (my own University is your nearest Australian neighbour) — Australia might be thought to have a message to set forth, and in a sense it has, yet it is a message surrounded by warnings which need to be heeded. Australia has not escaped the western malaise of the present unpopularity of the exact sciences.

From a situation of over-demand and entrance quotas in the physical and chemical science faculties of the universities there has been a swing strongly towards the study of social sciences, economics and literature. Subjects like engineering and geology and physics are no longer popular as they are believed to be difficult — which is no doubt true, but was always so — and also known to demand further training subsequent to graduation, often demand periods of field experience in socially unattractive enviroments.

The thinking parent therefore, sees that financial gain, even wealth, can be sought in less ardous ways. The business entrepreneur, the expert in company manipulation, the capital gain investment field, the zest of the share market — all appear more attractive than the mild servitude of the technological expert — always on hand but never in control of what really matters nationally.

The widespread introduction of Colleges of Advanced Education — a euphomism for technological institutes — with Commonwealth Government encouragement is a recent Australian phenomenon of as yet unproven value. The motives are mixed — to get more science graduates into industry ! To provide industry with the type of graduate it is believed to need or to want ! To open up doors for a greater number of young persons to end up with university type training or qualifications ! Plausible or not the outcome and significance is unknown. It remains to be seen whether more graduates do go into industrial research and development. It remains to be seen if this is a cure for the paucity of fresh and invigorating ideas for the young industries. It might be asked, quite fairly, whether these are not the new training grounds for a technological peasantry working at the behest of the captains of industry or merely executing the less taxing scientific tasks meted out condescendingly by fundamentally based, superior technical enterprises overseas.

The record of research and development by Australian industry is at present a very poor one on world standards. In the early

development of the country technical innovation led to interesting progress in mining, forestry and farming methods, but with a reliance on a favourable balance of payments from the export of primary produce, a slow recession has occurred to the current policy of buying technical knowledge or products from overseas. The usual excuse given for this backward trend is the lack of a large home market and the shortage of a suitable pool of labour. This argument has tended to ignore the enormous potential export market offered to Australia by the strategically and favourably situated Asian countries. Another argument used is that Australia herself is a developing country, and is in no position to embark upon industrial expansion in the light of the vast and enormously spread out primary and mineral products of market interest. But the history of mineral development — even in a brief century of Australian experience — is that it does not develop or settle the country. It opens up some pockets for a few decades, and these, with their inhabitants, tend to collapse back to the city areas as the profitability of the venture declines. The contribution is to Government revenue — which is very important and not to be overlooked — and to financial trading, but a balanced progression in national maturity does not necessarily follow such developments.

The scientist sees this and knows that unless a start is made at some stage Australia will never lift itself out of the category of a developing country serving an unending technological tutelage to overseas industrial and financial interests. Her scientists and engineers, though busy and well fed will lack stimulus and vision, and a sense of teamwork in their own national development and will drift into semi-scientific or purely business posts or become in turn candidates for a brain drain to overseas.

What are some of the changes which have puzzled and distressed scientifically trained persons over the last couple of decades? The poor response to research and development activities in many operating industrial concerns! The decay and eclipse of the reliable and well established research associations. The predicament and disillusionment of scientific personnel in industries subject to massive take-over deals which have led subsequently to so-called financial rationalizations which have closed down major fields of technical endeavour! The continued belief, in British countries at least, that good or better research results can come by organisational change alone, e.g. the spilt up of the D.S.I.R. in Britain, the formation of "green paper planned" national development corporations in Britain — and similar concepts in Australia. One scientific organisation for example, for which the writer once worked in the United Kingdom was first a Ministry of Supply laboratory, then in the Ministry of Aviation and more recently under the Ministry of Technology — all within about one decade. Scientists who are criticized for not wanting to leave university security and for fearing to risk their skills on the open market can perhaps be forgiven some hesitance as they survey the variabilities generated in the corridors of power.

A few years for example, we have being told that, in order to survive our nations needed a massive injection into the labour force of trained chemists, mathematicians, physicists and business administrators. Today we hear talk of oversupply, too few jobs, too many doctors of philosophy, even — quite incredible — too many teachers. Only the medicals, the engineers, the dentists and the experimental agriculturalists seem to be welcomed by a waiting, needy populace.

Such today is the dilemma of science and technology in the very lands claimed to have been made strong and powerful by its application !

What lessons can we learn from all this ? What stand can we take for the future ? Is there a path through the morass for the countries striving for technological maturity ? As in so many other fields of endeavour the danger is that the disciples are more ardent and less far sighted than the founders. The danger is for the voice of western scientific progress to be heard as stridently, that the underlying problems, the disadvantages, the impact on personality, and the claims on a family and home are unheard. The danger — as for example in the Russian electrification programme — is to be persuaded that technological advance is the greatest necessity. Seeing evidence of material benefits on many sides, it is hard to probe beneath and to perceive the blights that western technology has brought in its train. Labour relationships have decayed, home ownership has receded, responsibility for and ability to care for the aged has faded, and a sanctity of the personality has shrivelled in the light of concepts like "labour forces, "male and female operators," "the unemployment pool." The technologist can be told to get on with his specialism and leave the administrator, the organiser, or the government committee to look after the intangibles of the situation. This however, is capitulation to the growth of a technological peasantry ! Let us hear the heart cry of a noble scientist as he surveys the ruins of his best hopes. Physics has found general principles and criteria rising above national boundaries and political groups. A striving after respect for abstract truth and factual honesty, a high regard for the elegance of a method, for the profoundness of a theory, for good work, no matter who has done it or where it was done.

But does this scientific mentality contribute to the solution of the problems that were created by the material application of physics ? There is no satisfactory reply to this infinitely sad situation. There are however, some positive decisions we can make and some paths we can follow.

We can re-assert a satisfaction and sense of worthwhileness in scientific endeavour for its own sake. We can be filled with curiosity and awe, and a sense of discovery as we were the natural philosophers, and the early chemists, and the biological scientists. We can restrict the rampage of the so-called popularisers of science looking upon them as seducers and prostitutes of a noble human endeavour which does

not depend on blatant publicity, and overemphasised market research, We can expect that within our nations the cycle of interest will turn, and it will be realised once again that solid hard work, both theoretical and experimental, is necessary to make true and lasting progress in any field. That for such work to be pursued requires time — for which there is no substitute injection of it — and seeks the encouragement of an understanding and appreciative enviroment.

Finally, let the clear beacon of the contemporary situation remind us that scientific and technological endeavour is a way to material progress which must proceed with the utmost care and respect for the individual susceptibilities and personalities, not only of its own disciples and adherents, but also of the vast numbers in the community, waiting, dependent and expectant. Let the Asian lands therefore, with their advantages of large numbers and of long traditions, go forward to an increased productivity in food, and health, and housing, and the essentials of contented and responsible living, and the pursuit of true knowledge.

ENGINEERS OF TOMORROW AND ASIAN UNIVERSITIES

by

D. K. Ghosh
UNESCO.

Introduction

Let me tell you a story — an old one. Many of you already know it. I hope you will forgive me for repeating it here. This is the story of an aneroid barometer. A chemist, a physicist, a mathematican and an engineer were each given an aneroid barometer and asked to determine the height of a tall tower.

The chemist measured the air pressure at the ground level and at the top of the tower by means of the barometer and determined the height. The physicist got hold of a long rope, went to the top of the tower, swung the barometer at ground level and determined the height from the period of oscillation. The mathematician went a long way away from the tower, lined up the barometer with the tower, and worked out the height using his geometry. The engineer had forgotten all these methods. So he simply telephoned the architects, found out the height, and took the barometer home as a souvenir. I suspect the engineer must have acted on the advice of his economist friend.

However, in spite of obvious exaggerations, the point I am trying to make is that in getting certain jobs done, which, as I will shortly point out, is one of the functions of an engineer, one needs a good deal of common sense.

Qualities of an Engineer

Engineers must have, above all, a highly developed common sense — you may even call it an extraordinary common sense. How does one develop one's common sense ? Not only by cultivation of one's keen sense of obvervation and awareness of casuality but also by a systematic training in a certain discipline — by applying scientific methods, if you like. What are, then, the qualities of an engineer ? A good engineer, as we know, must be capable of using his hand as well as his head with equal dexterity. The old definition still holds. An engineer is one who can do a job that any other fool can do, except the engineer can do it at half the cost, in half the time and with twice the reliability. This calls for an organised training. Thus, a formal training is essential to supplement the education of an engineer who should possess some ingenuity, some inventive inclination and a good deal of improvising ability.

At this stage, just to avoid confusion, I wish to point out the essential difference between a professoinal engineer and an engineering technician. It has been generally accepted that an engineer is capable of assuming independent responsibilities, exercising his judgement in design, development, construction, production and maintenance work, supervising technician and guiding other engineers. His work is predominantly intellectual and varied. A technician, on the other hand, is capable of applying in a responsible manner proven techniques in a certain branch of engineering, of working under the direction of professional engineers and supervising skilled craftsmen. His work requires a high degree of skill and application of existing techniques. In this paper, I shall generally refer to the professional engineer when I use the term "engineer".

As you may notice, even in the accepted definition of an engineer, the emphasis has been on getting things done. An engineer is expected to get jobs done, to keep equipment and machinery in proper order, to build roads and bridges, to construct means of transportation, to build power stations and communication links, to design and operate chemical and production plants and so on.

This is not enough

And here I wish to introduce the central proposition in this paper. An engineer must not be satisfied with the idea of simply getting things done. He must constantly search for things that can be done, he must search for new methods and techniques that can be used, he must try and use new tools and new materials that are available. I shall come back to this idea in the sections on training of future engineers and the responsibilities of Asian universities. I shall argue that for engineers of tomorrow it is the latter function, that is, to search for things that can be done is of utmost importance. A sense of dissatisfaction, if you like, must be the driving force.

Future Trends in Engineering

The subject matter of this paper is the engineer of tomorrow. Having outlined some of the qualities of an engineer — and I emphasize some but not all, as I shall presently refer to one of the most important qualities of an engineer, let us examine what kind of engineers we need tomorrow. To forecast what kind of engineers we need tomorrow let us establish the elements in engineering which are going to remain relatively static and those which are undergoing rapid changes. What, after all, is engineering? To my way of thinking, engineering is an exploitation of materials and its properties by skilful application of physical laws; utilisation of natural resources by conversion and transmission of energy, accumulation, interpretation and dissemination of information.

It is obvious that the concepts of physical laws remain static over long periods of time. Therefore, as far as the understanding of these laws are concerned, the requirements for the engineers of tomorrow

are virtually the same as those for engineers of today. This is a point well worth remembering when Universities undertake to train engineers and are overwhelmed by the task of devising a suitable curriculum.

As far as the tools of analysis are concerned (for instance, mathematical methods such as statistical analysis, differential equations, vector methods, numerical techniques, operational and transform methods etc.), they have a much longer life than the components that are being available in the vast engineering complex and the fabrication techniques that are being used. So do the design techniques. Although generalisation is impossible, design techniques, on the whole, change relatively slowly, with one singular exception. In many branches of engineering, design techniques have been revolutionised by the use of digital or hybrid computers. Again in the application of physical laws, many obscure laws are constantly finding new applications. So the skilful application has to be constantly updated. This has led to a rapid change in the fabrication techniques and the great need for finding new components and new materials. There are plenty of examples of special demand for new materials to meet special conditions. The striking ones come from the field of nuclear engineering and space technology. No less important in this continuous desire to improve application techniques and the standard of skill are the economic factors and the pressure of competition. What makes it exciting is the combination of new materials, new techniques and new application. Perhaps that is the secret of engineering revolution of the present century.

On the aspects of utilisation of natural resources and energy transformation, the thought that is uppermost in one's mind is the increasing demand for energy in a convenient form (such as, electrical or transportable fuel), the limitation according to our present estimation, of conventional global resources. Here again, the long-term prospects are matters of scientific investigation, although over the past few decades, much effort has been directed towards possible utilisation of nuclear. solar and geopotential sources. In the context of engineering, however, changes are gradual and their influences relatively moderate.

On the other hand, information engineering has truly become the science of the 20th century and its application a characteristic of our time. We may use the term to describe the whole field of information processing, communication and control engineering, cybernetics and man-machine relationship. Not since the discovery of the wheel has one single item made such a profound impact on our society, at least in the more developed parts of the world, as the high-speed electronic computer. It has even changed the way of our thinking. It can be predicted with confidence that by the end of this century there can only be a small fraction of population whose lives will remain unaffected by computers directly or indirectly. Consequently, the engineers of tomorrow will have to prepare themselves for a kind of engineering of which there is no precedence in history. In future, engineers will have

more and more to do with information and systems engineering involving man, machine, material and money in a complex manner. A rapidly changing society will impose rapidly changing demands on its engineers. In the face of such unpredictable expansion, in which Asian countries will also be affected, the engineers must develop a special quality. The point I like to make is this. Engineers of tomorrow must develop an attitude of mind which is flexibly creative, receptive to new ideas and trained to put these ideas into practice.

Role of Universities

Having established the nature of engineering, its future trends, and the qualities one may look for in an engineer of tomorrow, let us turn to the Universities and the role they can play in the training of such engineers.

It is not the purpose of this paper to look into the function of a University in its institutional capacity of educating people to a high level, but only in the context of training engineers and in particular, engineers of tomorrow.

One almost naturally accepts the role of a University as an educator. One takes it for granted that a University produces educated people trained in a particular discipline (or mixed disciplines, as the case may be). At this point I cannot stress this aspect of education too strongly. Engineers must be educated if they are to be of any service to the country. By education, in its complete sense, I mean our ability to appreciate the true value of man, his creative potentials and the physical environment in which he lives. Without education in this sense, his engineering knowledge can only serve a limited purpose. As it is today, so it will be tomorrow engineers must be educated. An educated man is always a valuable member of our society. Especially in Asian countries, where engineers assume major responsibilities fairly early in their career, the sense of social awareness must be inculcated in their educational process, as I have pointed out in an earlier paper [1].

At this juncture I wish to dispel any misconception one may have regarding the function of Universities in training engineers. Universities do not produce trained engineers, nor do they claim to; they only produce potential engineers. Universities only train their students to think as engineers and to do only a few of a vast number of things that they may be called upon to do in course of their professional career. One must recognise that the training and utilisation of engineers for the benefit of a country is a complex system, in which the University only plays a small part, but an important one.

At no point in history has technology made such a profound impact on our society and on our thinking as at the present moment.

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1. GHOSH, D. K. — "Development of Special Curricula For Current Needs and Conditions in Asia". **UNESCO Regional Seminar on New Approaches to Engineering Education in Asia** K.L., 1970.

In this respect, engineering stands unique. More than any other forms of discipline, engineering has a direct and intrinsic relationship with industry and economic development. It is, therefore, fair to expect that the training programme should be an integrated one in which industry and university both share their responsibilities. Universities have to maintain a certain academic standard. Here the academic considerations are of primary importance; whereas industries must be motivated by profit considerations. Although the ultimate needs may converge, differences in the objectives may give rise to conflicting and often wasteful efforts. That is why it is all the more necessary to define the role of the University in its task of training engineers and incorporate such function in the overall national policy for development. Universities, in this respect, cannot work in isolation and fulfill their role effectively. There are certain dilemmas in preparing an engineering curriculum for the Universities and in recent years, mainly due to rapid advances in technology, such dilemmas have become abundantly clear or rather the state of confusion has really started to prick the conscience of the educational planners. I contend that many such problems can be solved if an integrated national science policy for development is formulated, in which the role of science and technology, and in particular, the roles of universities, technical colleges, industries, research institutions, and the government are fully defined. This brings us to the second major proposition in this paper and that is the necessity for an overall national plan which will not only indicate the quality and quantity but ensure proper utilisation of trained manpower.

To illustrate my proposition let me go back to a point I have already made in the early part of this paper. We need engineers who can get things done, keep machinery moving and so on; we also need engineers who can search for things that can be done, use new methods and material that can do things hitherto not done. So far, in developing countries much effort has been put into training of engineers of the first type and not enough for the second. We need engineers who can do more than what is required for normal growth or expansion. So often we hear that engineers must be trained to meet the needs of a country. As such, the statement is deceptive. Of course the existing needs must be met and the additional needs due to expansion must be met. But this is a matter of quantity and not of quality. Engineers of the first type will be able to cope with it; whereas those of the second type (those who search for things that can be done) will no longer be satisfied with simple expansion. Needs are not only to be met by them, but created by them and for them. As Malcolm Adiseshiah has pointed out 2 the educated person can and will create his own employment, if the economy was integrated into the educational system, instead of the other way round. Thus, future engineers should not only meet needs arising out of regular growth, but project anticipated or even unexpected needs for change as opposed to expansion. It is only by change that real progress can be made.

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2. ADISESHIAH, MALCOLM S, — "The Seventies: Decade of Decision" **UNESCO Chronicle,** Vol. XVI, No. 4, 1970.

I suggest that Universities should concentrate on producing the second type of engineers, who can eventually make an impact on society by their contributions. It is obvious that one essential condition must be fulfilled before one can embark on this shift of emphasis. That is, first type of engineers must be available in sufficient numbers. It can even be done by training an adequate number of high level technicians. Unless that is ensured, University training will be pointless, leading to frustration, misfits in jobs and all the associated evils. So we see that the nature of training of engineers at universities will very much depend on general industrial development, availability of high level technicians and their training facilities. and above all, an attitude which reflects an environment of creative activity. Hence, the need for an overall integrated national plan. If one considers the effect of cultural and social environment, of pre-university education at schools and motivations for an engineering career, one realises the complex nature of the system. It is for this reason I am in favour of a systems approach towards formulating the integrated plan.

Responsibilities of Universities

The Universities, thus, have manifold responsibilities. First and foremost is the task of educating engineers. In this respect I should like to direct your attention to the recent appeal [3] of Rene Maheu, Director-General of Unesco. Having regarded education as a great complexity of activities directed to the accomplishment of a large number of functions, he feels that the aims of education should be emphasized even more than the mechanism of education. There is much talk about how, but not enough about what and even less about why. What sort of person should education produce and why that sort of person should be produced ? We must find answers to these questions. Engineering education in its essential nature should be no different from any other form of education.

Secondly, the task of the Universities is to prepare them for a professional career and make them fully aware of their social responsibilities. The sphere of an engineer's social responsibilities will undoubtedly increase in the future, making greater demand on his judgement and action. For instance, future engineers in their capacities as industrial leaders will be expected to take part in the scheme for the training of younger engineers. If engineers become aware of such responsibilities through their university education, the problem of industrial co-operation and industrial participation in the training of engineers will be considerably simplified. Another example of their responsibilities: they should, in all their activities, be aware of the long term effects of biospheric pollution in view of the increasingly harmful consequences of interference with nature.

Thirdly, the Universities should try and introduce in the educational scheme a way of retraining engineers. Postgraduate courses, refresher

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3. MAHEU, RENE — "Education and Man's Development". **UNESCO Chronicle,** Vol. XVI, No. 4, 1970.

courses, short-term courses should be regular features of University activities. Seminars and symposia should be encouraged so that the practising engineers, the teachers and the research workers can exchange their views and problems. It is only by positive efforts in retraining that the formidable threat of going out of date can be averted.

Special Task of Asian Universities

What I have said so far, I think, applies equally well to Asian Universities. In addition, Asian Universities have special responsibilities. To start with, Asian societies are in a state of rapid evolution, changing against a background of ancient civilization and complex cultural patterns based on long tradition and rigid social structures. Asian Universities in imposing an educational pattern of advanced technology must recognise this bipolar tension between tradition and innovation.

In the past, Asian teaching practices have been criticised for discouraging inquiry and initiative among students and perpetuating a static and passive outlook on society and its problems,. According to a report[4] published by Unesco in 1966 there is excessive emphasis on conformity, and not enough on independent discovery; literary subjects, looking towards prestigious white-collar employment, take undue precedence over practical and scientific instruction. It is clear, then, that a change in outlook is necessary. Teachers must be of the highest calibre, if the task of Asian Universities is to be approached with any seriousness. Universities can no longer afford to remain as mere functional bodies symbolizing a necessary but outmoded industry of authenticating the degree as the passport to a better life. Like the heart and soul of a body the University must generate activities and propagate forward-thinking ideas with all embracing thoughts for humanity. In this, Asian Universities have a vital part to play. Of course, when resources are limited, priorities must be established.

It is not so much in the mechanism of transfer of knowledge, but in the difference of social environment, in the motivation of Asian students and in the ultimate responsibility the society entrusts upon its engineers that special attention of Asian Universities is called for.

In an analysis[5] of social factors affecting science and technology in Asia, Jan Dessau concludes that Asian societies can accept modern science and technology without any major difficulty other than that of communication — communication between scientists, engineers and technicians on the one hand, and groups such as politicians, government administrators, industrialists and workers on the other. To overcome this difficulty, at least to a large extent, as I see it, the creation and effective operation of an integrated national policy as suggested in this paper, are the primary essentials.

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4. UNESCO — An Asian Model for Educational Development, Perspectives for 1965 — 1980, Paris, UNESCO, 1966.
5. DESSAU, JAN. — "Social Factors Affecting Science and Technology in Asia" **Impact of Science on Society** Vol. XIX, No. 1, 1969.

Conclusion

In conclusion, one may say that Asian Universities have an important role to play in creating the right kind of engineers of tomorrow — the kind who will go on searching for things that can be done. They can effectively do so under an integrated policy of training and utilisation of manpower in the context of total economic development. Engineers of tomorrow, on the other hand, must first and foremost be educated with an increasing degree of awareness of their social responsibilities based on their training and built on their knowledge and experience.

There is one further point — an important one. I could think of no better way of expressing it than referring to a paper [6] by James Perkins on "The Crises of the University". In it he enumerates five crises which Universities are facing — the crisis of numbers (of increasing students), the crisis of cost (of running Universities), the crisis of relevance (of subjects and applicability), the crisis of priorities (between the neutrality of free thought and the instrument of social reform) and lastly, the crisis of a new scepticism, about which he says "the comfortable Western belief that reasoning man in a reasonable universe would increasingly comprehend his environment to the benefit of a better evolution of mankind is a notion that has less currency with each passing year. In its place has risen a mysticism and a belief that somewhere in the dark reaches of the mind, in the senses and sensations, in feeling rather than in thought, one is more likely to find truth than in an objective examination of the world around us."

To my way of thinking there is no mysticism and this new belief is nothing but another expression of the fundamental concept of Asian philosophy, which has come round to Asia through a complete cycle of Western rationalism. No doubt, against the background of a rapidly changing social environment, it is the force of this crisis of scepticism that is going to determine whether to shatter or sustain the very existence of Asian Universities of tomorrow. And in the turbulence of the dynamic display of such ideological forces, the engineers of tomorrow will have to find this expression. Engineers of tomorrow will be remembered day after tomorrow, not by the multitude of tall buildings they will build, nor by the magnitude of speed at which they will fly, nor even by the millions of miles they might explore in space, but simply by the totality of their efforts, according to their abilities, in creating happiness for their fellow human beings.

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6. PERKINS, JAMES A. — "The Crises of the University" **International Symposium on Education and the Development of Man.** UNESCO Paris, 1970.

AGRICULTURE EDUCATION AND ITS DEVELOPMENT IN SOUTH EAST ASIA

by

D. S. MacLusky,
Faculty of Agriculture,
University of Malaya.
Malaysia.

South East Asian countries have their own indigenous education institutions, but their educational structures, including the Higher Educational level, are in general derived from the various Western powers who influenced them during the last 100 years or so.

Thus the educational system of Indonesia at University level in particular, closely resembles the Dutch system; in Malaysia it closely resembles the British system and in the Phillipines, the American system. An exception is the Chinese medium in Malaysia and elsewhere.

There is therefore great diversity of system as well as of language. They have in common a fairly long history, in that the various systems were established in a small way 50 years or more ago. They also have in common more recently a relatively rapid rate of development compared with Western countries.

For example in Britain though the first Universities were established in the 1200's, five hundred years elapsed before the first Professor of Agriculture was appointed in Edinburgh in the late 1700's, and another 150 years elapsed before Technologies and Agriculture were introduced at University level in the late 1800's.

Similarly in America, though about six universities including Harvard had been established before Independence, in 1776, a hundred years elapsed before any substantial expansion of Higher education took place with the establishment of the Land-Grant Colleges in 1862; and about another 100 years elapsed before these expanded and matured into the State Universities we know so well today.

But this is the 20th Century and South East Asia cannot afford to develop its higher education at a similarly leisurely pace, least of all agricultural and technological education. For example, Malaysia has established three universities in the last 10 years or so and each is expanding and developing rapidly. The same is true of some other South East Asian countries. There is therefore no need to accept the pace or the ideas of different situations many years ago.

A third factor most South East Asian countries have in common is, of course, the development of national aspirations and the responsibility of developing their own educational systems to suit their own aspirations and their own needs. The supply of highly trained Agricultural, Scientific and Technical manpower is not yet such that higher education and research can be developed rapidly without some help from overseas. This help, and if not help, advice and ideas, and occasionally instruction, are coming from a wide variety of sources. No one so called "Developed Country" any longer has the monopoly of influence in any S. E. Asian country. Independent sovereign countries are now receiving help, advice and ideas from countries where ideas and systems differ from each other and are different from those of the receiving countries.

The Relevance of Western Systems to S. E. Asia

Two questions now arise. One is whether the various educational systems implanted in S. E. Asian countries are entirely suited to the indigenous needs of each country. It may be that they were more suited to the needs of the country from which they were derived some time ago. The British tradition for example as it was when introduced many years ago left a legacy of undue emphasis on the humanities and too little on practicalities.

The second question that arises, is whether the new ideas and influences at higher education level are properly related to the established educational systems of the different South East Asian countries on which they may now be implanted. Maybe the educational systems of all these countries need change and modification, but unless and until they are changed, there is some risk of confusion and instability if new ideas from overseas are accepted without careful adaptation.

Because new ideas from different educational systems are now more freely interchanging, and because this is a time of rapid and urgent development in S. E. Asia, it may be useful to briefly summarise and broadly compare the educational systems from which most South East Asian systems are derived.

Educational systems derived from Europe and America

Broadly speaking the educational systems of South East Asia as we now see them and also the trends in development, ideas and assistance are derived from two rather different educational systems. One in the European system and the other the American. It is easier to generalize about American than it is about European countries. Britain in particular is the exception rather than the rule with its advanced 6th form school system and its specialized Honours Degree system, but the general educational approach in Britain more closely resembles the European system than the American.

Broadly speaking the American State Universities date from the establishment of the Land Grant Colleges in 1862 which, unhelped and

unhampered by the existence of older more conservative institutions (as in Europe) set about the development of Americcan agriculture in the context of wide open spaces and relatively recent land settlement. It is well known that they did a great deal to develop American Agriculture, and they do a great deal more now that they have blossemed into State Universities with a very wide range not only of Agricultural subjects but also of Science, Technologies, Humanities and Professional courses.

This is the first point, that American Universities offer an extremely wide range of subjects on one campus from vocational to purely academic, all under the umbrella of a University Degree; whereas in Europe different subjects have developed in different institutions in separate examinations, each catering to its own sector of the educational spectrum. In Europe the different institutions are in a hierarchical structure of different levels of sophistication and status, and not all using the term 'Degree'.

This leads to the second point, that in principle anyone who completes the higher educational system is eligible to enter the one University system whereas in Europe the educational system is highly selective. Students of different levels of eductional achievement and different sorts of aptitude are creamed off or diverted into different sorts of institutions at successive levels of the educational ladder. Those relative few with University entrance requirements are further selected before admission, and in Britain selected again at the end of the first three years of the University Course. The British system is unusual in that it has those two years of advanced 6th form schooling which accomplish for the chosen few what America and others do for the many in the first one or two years of the University Course : and also exceptional in offering Honours Degrees of increasing specialisation year by year until in the final year one subject only is offered and offered only to the upper 2/3. The others graduate at 3 years with ordinary Degrees.

Thirdly the American Science Degree structure (and those which resemble it) starts off on the assumption of a broad and none to deep High School Education and first offer broad introductory ranges of courses with ever increasing scientific level. In Europe the scientific and other foundations are more firmly laid at school and early in the University courses with successive years of orientation to a specific applied topic especially in Agriculture. To some extent the two approaches are opposite. The American Universities might be said to be coping with the deficiencies of their High School System. The European systems, British in particular, can be critised for developing specialisation far too early in the student's life creating what C.P. Snow called the "Two Worlds" of Science and Arts. At one time the whole Public and Secondary school system in England seemed to be orientated towards the academic requirements of Oxford and Cambridge, to which very few sudents indeed would in fact go. Both countries are remedying their defects.

The selectivity and hierarchial structure of Education including Agriculture Education in Europe may at first sight appear to be unduly aristocratic and restrictive for the needs of a so-called developing country. This could happen to be true if one ignores the fact as many do, that the system is geared to the presence not only of Universities but also of non-University Colleges and Technical Schools which ensure that people of appropriate aptitude, and training are chanelled into each segment of the manpower spectrum.

Similarly the American system with its big centralized broad-based Universities and relatively easy entrance requirements may appear at first sight to be the more efficient and democratic for the purposes of developing countries. The number of students enrolled at American Universities in America as a percentage of the population is the largest in the world. In 1960 there was 125 University students per 10,000 of the population in America (all subjects) compared with 56 in USSR, 32 in the Netherlands, 20 in the UK and about 10 in Malaysia.

American Universities however, whatever standards their course may reach, start off at a lower educational or academic level than in Europe. This tends to increase numbers enrolled at any one time. There is however a very much greater drop-out-rate than in Europe due partly to less selective enrolment. (40-50% in USA compared with 14% in UK). When account is taken of these two points, and when allowance is made for the fact that European countries have a larger number of smaller and more diverse College and Institutions in addition to Universities, the net result is a very similar numbers of students completing higher education courses of one sort or another. As a percentage of their respective age group in the population, the number of students successfully completing higher education scientific or technical courses in 1960 was 3.7% in USA, 4% in UK and 4% in USSR.

To discuss which of these different approaches is inherently the best would be quite ridiculous, for each is tailored to the educational system and social milieu to which it belongs. And neither of these is necessarily precisely relevant or ideally fitted to the needs of all S. E. Asian countries. Both in any case can be improved and in fact American and European systems are changing to suit the times and becoming increasingly alike.

There is one respect in which the American State Universities are perhaps unique, and this the convenient grouping together on one campus not only of different Colleges of Agriculture, Science and the Humanities, but also the close integration with Research Stations and the Extension Service. This is the essential most important feature of the system. No American State University isolates its Agricultural teaching.

The Misuse of Words

Apart from the important point the differences between American and European Systems are being reduced to a question of course struc-

ture and terminology. The different terminologies lead to misconceptions and confusion. Words are being borrowed and used both without a proper enquiry into and appreciation of their meaning. For example India has recently successfully followed the American idea of Land Grant Colleges in a similar context of wide open agricultural spaces and the lack of any local University or College. But naturally India did not see fit to put the clock back to 1862. Instead it has followed the pattern of the State Universities by locating other necessary areas of study (Arts and Sciences) on the same campus and has called them first, Rural Universities and later Agricultural Universities. An Agricultural University is not a College of Agriculture with a status name. Without the presence of other areas of study on the same campus, without a strong research programme, and unless the course is advanced to the level whereby students are given a solid foundation of the underlying Sciences so that they can think from first principles rather than the details of current agricultural practice, then the word Agricultural University is a contradiction. This is particularly so in a multi-racial society where the maximum interchange of personal company, ideas and attitudes is fundamental to mutual understanding.

The Relevance of Western Systems to S. E. Asia

The first question is whether other approaches can be adopted for use in S. E. Asia countries? The answer is that both already have been adapted in one country or another, along with corresponding educational infra-structures. But has the time come not simply to adapt foreign systems but to adapt the existing systems of S. E. Asian countries more closely to their needs? The answer is probably yes. In Malaya for example there is no urgent need to raise the existing academic standards at school level. There is a need to broaden advanced schooling to a greater proportion of the population and this is being done along with expansion of Colleges catering for those school-leavers who require further courses before University entrance.

The second question arising is to what extent can ideas be borrowed from overseas to evolve an improved higher educational system? It is important to ensure that any new ideas are appropriate to situation into which they are implanted. To reject new ideas or approaches would be stupid, but to accept new notions or words without careful scrutiny and adaptation to local conditions could lead to development delays, frustration and even instability.

What are in general special needs of S. E. Asian countries?

The General Needs of S. E. Asian Countries

Firstly it is important to note that S. E. Asian countries are still primarily agricultural and thus Agricultural education is required at all levels or all sectors of the technical spectrum including some very advanced training, for research and policy making, greater numbers of people trained in the 'know-how' for specific recommendations of agricultural practice, for supervision of practical agriculture operations,

and thirdly even greater numbers of skilled operatives who know how to do what they are told to do.

Malaysia has these planned out in predetermined ratios based on smallholder acreage. If there is any temporary weakness it is in the supply of skilled operatives. Other countries are in peril of neglecting the more advanced or specialised sectors.

Secondly, the percentage of the population undergoing some form of higher education may be smaller than it is in developed countries, and should be greater. But so far as Agriculture is concerned the ability of S. E. Asian agriculture to absorb technical manpower is and will for some time be very much less than in temperate areas, except at the vocational, operative level, when it could be much greater. This is because of the predominances either of very small Smallholdings which cannot afford to employ the more scientifically trained personnel, or of some Estates, which employ relatively few technical men per acre. This also puts an earlier limit on the manpower requirements for ancillary industries. The onus for employment of research managerial technical and advisory personnel is thrown more on the National Governments than in developed countries, and thus limits the demand.

The size, output and precise function of educational courses at different levels therefore, regardless of nomenclature, needs to be carefully defined and planned, as it has been in Malaysia, to keep pace with the development of the economy.

In addition to the risks of becoming too preoccupied with advanced University level education, or alternatively of producing too few practical men on the gound, there are social reasons requiring careful thought before acceptance of overseas ideas.

The Different Social Attitudes of S. E. Asia

In S. E. Asia the ambition of most rural youth is not to revolutionize Agriculture but to escape from it. Curricula, however advanced, have to be orientated in such a way that the field as far as possible becomes the laboratory. The social structures and employment structures are such that education takes on a traumatic "all or nothing" character. Too often personal success or failure in a training programme means the difference between an expansive future and relegation to the padi fields or the shop house.

On the assumption that young people in S. E. Asia are as highly intelligent as anywhere else and the needs of these countries are more urgent there is no justification for any drop in standards at any given level or training relative to the training they would receive elsewhere. But the "all or nothing" nature of education here, coupled with the peoples personal sensitivities and pride, is such that standards should not be maintained at the expense of high drop-out rates.

Therefore an easy-entrance-easy-dropout system is both inefficient and callous. To "drop-out" in U. K. or U. S. A. is of little social consequence. In S. E. Asia it is traumatic. Logically a selective educational system which allocates each person to an institution or training programme appropriate to his educational background and aptitudes, ensures minimal dropout, minimal loss of face, maximal economy and employment suitability.

This approach by itself is still not enough. To avoid frustration or wastage, there should be maximum flexibility and cooperation between educational institutions or interchange between educational streams, according to students' demonstrated aptitudes, and to allow unimpeded assent of the educational ladder to the limits of each individual capacity. Without this, students of talent may be limited for life by deficiences in their earlier schooling.

Again, the "all or nothing" nature of higher education in the South East Asian context, is such that extreme tensions are generated at examination time though not at any other time. Examinations are so ponderous and so infrequent under traditional European systems that a student's future can be decided one way or the other in the course of a few hectic days or hours once a year. Admittedly there are opportunities for a second or even third attempt, and also the terminal examination system allows a less formal periodic assessment of progress. But more consistent steady work with less "examination fever" would result if a leaf was taken out of the American book in the form of more frequent progress tests officially credited into the final assessment. The only drawback of this system is the danger that students might work too hard and fail to enjoy the social education that Universities are intended to provide.

Perhaps more important is the fact that in a country like Malaysia with different educational streams related to language and to race as well as to academic orientation, different students make different rates of progress in different areas of study. Some are recognisably "slow maturers" as intelligent as anyone else but delayed by features of their different educational backgrounds and possibly by language. A unit system of instruction which would allow each student to progress in each subject of study at his own personal pace does much to ensure that the budding biochemical genius is not nipped in the bud by his difficulties in pure mathematics.. This is particularly important in a course of very broad content such as Agricultural Science. The only difficulty that has to be overcome arises from the fact that some subjects are necessary prerequisites to the understanding of others.

Finally and perhaps most important, is the fact that students in S. E. Asia (partly for reasons already given) are unduly concerned with the memorization of facts and unduly reluctant to use their innate intelligence, to use their own commonsense and to express their own critical ideas. A higher education programme which relies entirely

on course-work may produce a generation of knowledgeable persons unable to put their knowledge to any useful purpose. Undue emphasis in course work throughout the world is spreading beyond the first degree up through Masterates to Doctorates. It is impossible to teach everything about everything. It is for these reasons that the Agriculture Degree of the University of Malaya has been changed from one of total instruction to one of partial self-instruction whereby students are offered an agricultural problem of their own choice and as required to spend part of their final year sorting it out for themselves. They then go into Rural Development or Research with Self-reliance and confidence.

Conclusion

The educational systems of S. E. Asia are derived from different overseas sources and need adaptation to each country's particular requirements. The uncritical acceptance of new ideas prolongs the irrelevancies and misorientations. The higher the higher educational level the greater is the need for quality of education rather than quantity. Special consideration should be given to the social attitudes and social needs of S. E. Asian societies.

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UNIVERSITY TRAINING AND AGRICULTURAL DEVELOPMENT — A CASE OBSERVATION OF MALAYSIA

by

George Varghese,
Faculty of Agriculture,
University of Malaya,
Malaysia.

University today is looked upon as the highest seat of learning and training in a country in any organized disciplines which directly or indirectly contribute to the welfare of the society. From this seat of higher learning has to come forth purposeful thought and knowledge, especially new knowledge. Its main role is to mould youth endowed with intelligence, to become leaders in their selected fields so that in the future they can effectively and actively participate in their national affairs, upholding national aspirations and stimulating development. The latter two aspects become the more important in developing countries. The countries in Asia, with the exception of one or two, have emerged from being mere colonial satellites in the past into independent nations, with their own rights and aspirations. Small or large, these countries are all in the process of great national development, limited only by their potential natural resources. The magnitude of this transformation and the responsibilites which go with it can only be best sensed by a person who has lived in the time and has experienced this great change however biased his opinions may be. It is in this context that I had ventured to present this paper on University training and Agricultural Development — a case observation of Malaysia. Perhaps, I may also add that having been a founder member of the first Faculty of Agriculture in this country, in the then new and developing University of Malaya, has given me the added courage to deal with this topic.

University training in developing countries as revealed by Higher Education planning reports, lays great emphasis on its role in the social, cultural and economic development on the nation. These countries share in common the immediate task of raising the standard of living of the people through efficient utilization of human and natural resources. Looking on Malaysia, it can be seen that 50% of its population depend on Agriculture. Development of this sector — Agriculture and Fisheries alons with Agricultural Industries — has therefore become the prime concern of this independent nation. Of Malaya's Gross National Produce (GNP) 30% is derived from Agriculture. In spite of the Government's admirable efforts to increase

the contributions from other sectors, especially industry, so far it has lessened only by one percent the contribution Agriculture makes to the country's GNP. In this context Malaysia's effort to strengthen and give resilience to the Agriculture sector is well understandable, and deserves appreciation.

Plantation crop agriculture and plantation industry — Rubber being the foremost, took a firm rooting in Malaya in the colonial era. In independent Malaya it received a tremendous boost in the way of increased research on natural rubber, replanting high yielding materials and standardizing the quality of the export product through the Standard Malaysian Rubber (SMR) scheme. If money expended is at all a barometer to the progress aimed for, it is worth noting that 25 million Malaysian dollars were spent on Natural Rubber Research alone in 1968. However, over – dependence on a sole crop in the modern world has many threats, as was seen in the case of rubber in 1967 when Malaysia's rubber fell 50 cents a pound, an unprecedented post war price for this commodity. While it served as a forewarning of the above, it proved a shot in the arm to the existing Agricultural Diversification programme. Oil palm **(Elaeis guineensis)** a native of Africa introduced into Malaya in the early 1930s and had become established as a plantation crop of importance, saw tremendous increase in Independent Malaysia, the production level increased from 70,000 tons (palm oil) in 1958, to nearly 200,000 tons in 1968. Malaysia is thus vying for the position of the World's major exporter of this commodity. Rice the staple food crop in Malaysia during the same period increased by 255,000 tons. With the completion of Muda River Scheme and introduction of double cropping over 260,000 acres this year, Malaysia should be nearer to its goal of self-sufficiency in rice by 1973. Along with this, expansion is underway in a number of food and cash crops particularly in the case of maize, sugar cane, tapioca, banana and pineapple. The arrival of MARDI (Malaysian Agric. Research Development Institute) which will carry out research into these crops, is very timely.

The utilization of excess labour (unskilled or unemployed) as Gunnar Myrdal[1] had pointed out is a grave problem facing most Asian countries. Although this is acutely felt in highly populated countries, Malaysia has also its own share of the problem. The highest incidence is known to be in the 15 — 24 age group, among rural males. The Federal Land Development Scheme under the direct supervision of the Deputy Prime Minister Tun Abdul Razak, where landless rural people are resettled and provided with developed land and subsidy until the land becomes productive; and the recently started Youth Development Corps would help reduce this problem. It is again in this connection that development of forestry, especially timber industry and fisheries, are bound to show results which would considerably ease the unemployment problem in Malaysia. Significant

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1. GUNNAR MYRDAL. — **Asian Drama, an Inquiry into Poverty of Nations.** Allen Lane the Penguin Press, London, 1968.

improvement and increase in production figures have also been recorded in all these ancillary fields of Agriculture.

From the above, we could see that Malaysia's progress in Agricultural development during its decade of independence has been very creditable and is forging ahead towards greater achievement. However, to sustain the progress made and to strengthen further achievements aimed for, an important consideration would be the availability of suitably trained Agricultural personnel at different levels. And in the second part of this paper, I would like to devote some time to review the training of man-power especially with reference to University level training.

Agricultural training in Malaya had a comparatively late and slow start. The first attempt in organised training can be traced to the establishment of an Agricultural school by the Department of Agriculture at Serdang in 1931, providing a two-year course for the training of Agricultural Assistants. After World War II, this institution was raised to College level and the standard of instruction was raised to post-school Diploma with the instruction period extending to three years. It was only a decade ago that Agricultural training at University level was made available in Malaya with the establishment of the Faculty of Agriculture in the University of Malaya in 1960, assisted by a grant from New Zealand to the extent of $250,000 (M$2.1 million), under the Colombo Plan aid. Along with this, in order to provide for increased intake of students at Agricultural Diploma level, and to ensure close liaison between University and College, the College of Agriculture at Serdang became a separate authority under the University of Malaya.

Although the Faculty of Agriculture at its inception was planned for an output of 25 to 30 graduates, these numbers were inadequate with the increased demand for graduates in keeping with the rapid pace of agricultural development and the inclusion of East Malaysian states into Malaysia. A modest intake of 19 students in the first year and eight direct entry students in the second year constituted the first batch of 27 Agricultural students in the Faculty in 1960. In 1970, the first year student intake has increased to 116 a sixfold increase. The number of 1st year students in 1975 is expected to exceed 140, thus meeting the projected requirement of student intake recommended by the Higher Education Planning Committee.[2] This excludes the manpower requirements in special fields such as Fisheries, Forestry and Veterinary Sciences.

The content of a University Degree course in Agriculture has expanded so much due to advancement in knowledge in the various branches of Agriculture and the increasing role graduates are called upon to play in National Development particularly in Agricultural Industry. Curriculum planning has become therefore a major pre-

2. **Report of the Higher Education Planning Committee,** Kuala Lumpur, Malaysia, 1967.

occupation of Agricultural Educationists especially in developing countries. The object of our Fourth Year Course in Agriculture at the Faculty can be summarised as to provide a firm foundation of the scientific and economic principles underlying Agricultural production and to orientate these principles to Agricultural practice. Hence the curriculum includes a first year instruction in the basic subjects such as Biology, Chemistry, Geology which are mostly done in the Faculty of Science and the next three years in Agricultural subjects such as Plant Science, Animal Science, Soil Science and Agricultural Economics. In addition Agricultural students are required to take one year course in Biochemistry, Agricultural Engineering, Research methods and techniques and Agronomy (See Table I).

The array of subjects which an agricultural graduate has to study shown in Table I gives some idea as to the course-intensive nature of the discipline. The drawback of a heavy course-load curriculum is that it hardly leaves anytime for the student to appreciate what he learns, or think on a subject which suits his aptitude most. After all one cannot expect a student to be equally good in all the diverse subjects included in the Agricultural curriculum, ranging from Agricultural Botany to Agriculture Engineering, to quote as an example. To alleviate this difficulty to some extent, you can see that in our curriculum, we have modified the syllabus in such a way that in the final year the student can work in a field of his choice such as Plant Science or Soil Science, etc. and also carry out a short-term research project in the same field under the guidance of a Lecturer. The rudiments of specialization without upsetting his knowledge in the general field underlies this change, as the basic training has been pushed mainly into the first three years. Such a system does not prevent the graduate from being a general Agriculturist as demanded most in developing countries, and also caters for orientating the student to research and specialities determined by the national needs. Further it provides an element of choice to the candidate as to the field of study. Another significant feature is that it leaves room for expanding specialities in the final year level.

An aspect of Higher Education in Agriculture in developing countries which deserves particular attention is practical field training. With a heavy course load during the academic year, it is difficult to incorporate field training also in the regular array of subjects. In the Faculty of Agriculture, we insist that a student should complete successfully 40 weeks of approved field training. This is done during the University vacations when students are assigned to field stations such as Federal Agricultural Experimental Stations, Research stations, Estates and Federal Land Development schemes. However our experience shows that a significant number of our students come from urban back-grounds. Hence a more intensive exposure to organised field training in the first year will be most desirable. Provision is now being made for such facilities in the Faculty Farm which is now being developed.

TABLE I

A Summary of B. Agr. Sc. Curriculum, Faculty of Agriculture, University of Malaya *.

FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR
Biology A	Plant Science I	Plant Science II	Agronomy
	Agr. Botany Agr. Genetics Plant Physiology	Plant Protection (Plant Pathology and Agricultural Entomology)	Principles of Crop production. Agronomy of specific crops.
Chemistry	Soil Science I	Soil Science II	Research Methods And Techniques.
	Pedogenesis, Soil Physics, Chemical and Biological Properties of Soil	Soil fertility, Soil Conservation Survey and Land Use.	Experimental design. Processing of data
Ag. Economics I	Ag. Economics II	Ag. Economics III	Optional Subject *
Principles of	The Agricultural Economy Prices and Elasticity Land Economics	Farm and Estate Management Economics. Ag. Extension	(see below)
Any one of :-			
Geology	Animal Science I	Animal Science II	Project Paper
Geography Mathematics Physics	Physiology and Adaptation Reproduction	Animal Nutrition Genetics and Breeding: Animal Production.	(Original research)
	Ag. Biochemistry	Ag. Engineering	
	Biometry	Mechanization, power, buildings, surveying, soil and water-engineering.	

* 4th year Optional Subjects (Any one main subject)

1. PLANT SCIENCE III — Students opting for this subject will have to take any two of the advanced level courses listed below :-
   Botany; Plant Breeding; Plant Physiology; Plant Protection A — Plant Pathology; Plant Protection B — Ag. Entomology; Plant Protection C — Nematology; Seed Technology.
2. SOIL SCIENCE III — Soil conditions and Plant Growth, Fertilizer use. Geochemistry.
3. AG. ECONOMICS IV — Agricultural Development, Production Economics, Land Economics and Policy, Marketing Agric. Economics Research.
4. ANIMAL SCIENCE III — Animal Production and either Animal Nutrition or Animal Genetics and Breeding.
5. AG. ENGINEERING II — Mechanization of specific crops. Storage of tropic productions. Soil, water and field engineering.

Source : Adapted from UNIVERSITY OF MALAYA. **Faculty of Agriculture Hand-book, 1970,** Kuala Lumpur, pg. 5.

The range of subjects covered under the Agricultural Degree curriculum clearly shows the requirement of a relatively large academic staff. Taking the case of one subject — Plant Protection as an example, for effective teaching there should be a minimum of four academic staff members to cover the fields of Plant Pathology, Agricultural Entomology, Nematology and Virology. The present complement of academic staff in the Faculty of Agriculture numbers to 30 and in the next year this may increase to 40. With this the staff student ratio will be in the region of 1: 10. However with the increase in the range of specialities catered for developing Agricultural industries in the country, the number of academic staff also has to increase proportinately. The staff student ratio will then be in the region of 1: 5, as required by other professional courses such as Medicine. At present, filling academic positions with highly qualified people is a problem in Malaysia, as in some of the other developing countries. This shows the need for instituting staff training schemes, as some of the other Faculties have done in he University of Malaya. Our Faculty is seriously considering certain proposals in this direction.

Gain-full employment of graduates is another important aspect which deserves careful consideration; I would like to touch very briefly on this question. It is common experience that projected requirements usually do not tally with positions available at that time. Unemployment of suitably trained Agricultural graduates, even though it is of a short duration can lead to frustration and have far-reaching effects, even on the quality of the students who enter the first year. Higher Education planners should therefore give careful consideration to more realistic evaluation of employment opportunities. Overproduction of graduates at this stage is not healthy for national development. Table 2 shows how the University of Malaya Agricultural graduates have been channelled into the various employment sectors.

TABLE II

Employment of University of Malaya Agricultural Graduates (B. Agr. Sc. Degree Level)

Year	Govt.	Semi-Govt.	Private Sector (Agr. industries)	Teaching	Higher Studies (Full-time)	Others
1963	1	4	—	1	—	1
1964	2	5	3	2	1	1
1965	4	2	10	2	2	–
1966	2	4	8	4	4	1
1967	8	10	7	2	2	–
1968	4	6	8	3	6	2
1969	15	5	7	6	13	4
Total	36	36	43	20	28	9

Source : University of Malaya, **Faculty of Agriculture Hand-book, 1970,** Kuala Lumpur.

Among the 172 graduates produced until 1969, 95 percent found employment in the Agricultural Sector, Agricultural industries being the foremost. Only five percent are engaged in sectors not related to Agriculture. The table presented above also reveals that employment situation has not reached saturation limit; on the other hand employment opportunities for Agricultural graduates in other sectors are very limited. By 1975, the expansions in the Faculty will allow an annual out-put of at least 140 graduates, thereby trebling the 1969 number. One doubts whether gain-full employment opportunities would increase proportionately within the same period. One could with some optimism assume that these people would be absorbed with the agricultural development envisaged. However any further expansion of the output of graduates above 150 can be justified only after very careful study. One may argue that graduates can take over many posts now held by non-graduates. This again needs close scrutiny. For instance, Plantation Assistants' jobs in the Estates which involve routine practical work with some additional Managerial skill, could well be taken over by Diploma holders who are produced in the category II level, at a lesser cost. The same is also applicable in other Agricultural sectors. Therefore concentrated efforts have to be directed in the training of Category II (Diploma) personned in the next few years, as pointed out in the Report of Higher education Planning Committee.[3]

The great demand for research workers in Agricultural Sector in developing countries necessitates the development of a sound post-graduate training at the University. If we look at the Faculty of Agriculture in Malaysia, we can see that it has made notable progress in this direction. The number of post-graduate students have increased from 3 in 1963 to 42 in the current year. Greater expansion at this level of training is envisaged in the coming years. Post graduate research in Agriculture in developing countries should be problem-orientated. While "a study of the Butterflies in Rice field habitat" may serve as a thesis project in Entomology, it would be more meaningful in Agriculture training if this concerns "a study of Lepidopterous Rice Stem borers", a serious pest of rice. The practical application of the results should receive emphasis. Problem-orientated research would help the potential research worker to appreciate the practical problems and would also aid in orientating himself to field conditions rather than to the Laboratory. However the above arguement should not be construed as be-littling the value of basic research. Basic research can well be carried out in Biology Departments although there is no necessity to draw strict demarcation between basic and applied. Thus research carried out in Biology and Agriculture would becoming complementary to each other. Brief mention should be made here of the danger of inbreeding in research training, and it is in this connection that arrangements for external research training and study periods as is practised in University of Malaya, are worthy of emulation by other developing countries.

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3. Op. Cit. **Report of the Higher Education Planning Committee.**

With this I come to the concluding part of my paper where I would like to draw attention to the emphasis given in Universities especially in developing countries to the man-power requirements. In the context of what I have said earlier, this seems one of the vital functions of the University. The zeal for training the perfect technologist is gaining increasing momentum often at the neglect of 'Manhood'[4] training. The qualities of leadership, initiative, tolerance, sense of justice and adjustments to live in a plural society, are imbibed by the student during his corporate life within the University campus. As a University teacher I cannot fail to appreciate this aspect of University life, which actually maketh the Man. Neglect of this important role may lead to a decadent and derelict society, the development of which will be detrimental to the nation. Therefore I hope that in developing countries, Higher Education Planners, in their fervour for Man-power training would give due consideration to the important role of "manhood" training in technological disciplines such as Agriculture.

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4. 'Man-hood' as used by HUTCHINS, R. M. in his book. **The Learning Society.** Praeger, New York, 1968.

UNIVERSITY BIOLOGICAL EDUCATION IN MALAYSIAN DEVELOPMENT

by

Ho Coy Choke,
School of Biological Sciences,
University of Malaya,
Malaysia.

There is a need for excellent biological education in Malaysia. The Malaysian economy is primarily based upon biological products either for extensive exports (rubber, oil palm, timber) or mainly for domestic consumption (rice, fruits, poultry, cattle, pigs, fish). Furthermore human health, particularly in this largely rural country, is highly dependent on biological sciences. Historically, it was the utilization of biological knowledge in the introduction of rubber for extensive cultivation from South America by H. N. Ridley, Past Director of the Singapore Botanic Gardens and the control of malaria (Watson, 1921; Sandosham, 1965) at the beginning of the century which developed this nation.

Now more than ever, this biological knowledge is necessary to provide adequate living facilities for an expanding population. The important question is; What types of biological knowledge must be obtained through research and imparted to our graduates so that they can utilise them in the welfare of this nation ? This is a difficult subject, for biology is now a vast science of many disciplines.

First I want to emphasize that applied biology is so important that several branches of it like medicine, agriculture, forestry, fisheries and veterinary sciences have achieved status quite often greater than fundamental biology taught in present biological departments. There is need for close inter-relationship between departments of pure and applied biology.

Now is the flowering period of the biological sciences comparable to the splitting of the atom in physics during World War II. Most of the major developments in biology occurred after 1945, particularly through the introduction of physics, chemistry and mathematics into biology. Indeed many of today's leading biologists have Ph.D.'s in chemistry or physics. Probably the important advancement has been in molecular biology, where the classical postulated gene in heredity was equated with a sequence of nuclecia acid bases. The molecular mechanism of protein synthesis through production of massenger RNA leading to translation of the genetic message into protein at the ribosome was worked out. Micro-organisms such as viruses, bacteria

and fungi, and particularly their mutants, were extensively used in these experiments.

There were many other important developments. The amorphous cell content was seen under electron microscopes to possess a remarkably complex organisation of interconnecting membraneous structures to which can be found intricate organelles like nucleus, mitochondria, chloroplasts and the ribosomes. The molecular process of photosynthesis is now understood. The exciting advances in the hormonal mechanism of animals, particularly in man, have led to practical application of therapy and birth control.

The universities of this country are very young. Their biological departments have mainly been established along traditional lines with emphasis on general biology particularly comparative morphology and anatomy, taxonomy and ecology. Generally our universities have not participated in the major advances of biology of this decade. However, now is the time for us to assess our position. We have to plan new teaching and research programmes so that we can participate in the major biological advances of the future and to apply this knowledge for the economic advance of the country.

The major biological problems that remained to be solved are in molecular and developmental biology, functions of the brain and good management of natural resources. A few examples drawn from important papers all published in 1970 in molecular and developmental biology are illustrated below.

The first total synthesis of a gene in a test-tube was achieved by Khorana and his colleagues (Agarwal et al 1970). The classical pathway of transfer of genetic information in the cell has been the synthesis of messenger. RNA from the DNA template. Two American laboratories (Baltimore, 1970; Temin and Mizutani, 1970), independently reported that for certain RNA tumour viruses, there is an enzyme which does the reverse. These two discoveries, in terms of future applications of therapy of genetic diseases and cancer are tremendously important. The mapping of genes on human chromosomes have been achieved in tissue culture (Santachiara et al 1970; Ruddle et al 1970) and a specific staining technique for the human **Y** or male chromosome was discovered (Pearson et al 1970; George, 1970). These discoveries should overcome the difficulties of long life cycle, and absence of controlled mating, presently hindering human genetics.

There are similar major advances in plants. Cells between different species (oat and maize) can be made to fuse in culture (Power et al 1970). It is possible to obtain a whole plant from a single somatic cell (Steward, 1970). Remarkably Nitsch (1970) reported the production of haploid plants from the pollen grains of tobacco, without fertilization. The tedious and time-consuming procedures involved in present day plant breeding may now be hastened and combination of desirable characters previously unattainable may soon be achieved.

We must teach our students about these discoveries. Our teachers must do research in these subjects to obtain first hand information. We cannot delay these actions for it is certain that in the near future there will be many applications of these discoveries to our medicine and agriculture including the rubber industry (Bonner, 1969).

The unique and rich flora and fauna of Malaysia (Bullock, 1969; Corner, 1952; Ho, 1969; Medway, 1964; 1969; Poore, 1964) is a national biological heritage. The wise utilization of this natural resources will determine the future of this country. All aspects of biology from the molecular to the population level of these organisms, which are the products of millions of years of evolution are interesting and deserve worthwhile studies. They are particularly suitable for research and teaching at the organismic and population level. It may be mentioned for instance that this region is one of the main centres for crop origin and evolution (Ho, in press). Our university biological departments have a special role to be at the forefront in the teaching and research of tropical biology and to create a public opinion that their irreplaceable national heritage be conserved and utilized wisely.

In conclusion, it is clear that only through a biological education that incorporates the latest advancements of modern biology coupled with the understanding and feeling for its own biological heritage can our graduates have the vision and wisdom in tackling the numerous biological problems involved in the development of this country.

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MEDICAL EDUCATION IN SOUTH-EAST ASIAN UNIVERSITIES

by

Chan Kok Ewe
Faculty of Medicine
University of Malaya,
Malaysia.

South-East Asia is a geographical label applied to that region which comprises Burma, Thailand, Laos, Cambodia, Vietnam, Malaysia, Singapore, Indonesia and Philippines. It extends over an area of 1,567,966 square miles with a population of approximately one quarter billion. There are 30 medical schools in the region. About 14,000 doctors serve within the area which works out to a doctor: population ratio of 1:17,000. Except for Thailand which has been a monarchy, the countries in the region have, until their independence following the Second World War, been largely influenced by the countries which dominated the region. This is reflected also in the system of medical education provided. Thus we see the British type school in Burma and Singapore, the Dutch type of approach to medical education in Indonesia, the French influence in medical education in Vietnam and Cambodia and the American orientated programme of medical schools in the Philippines.

The Increase in Medical Schools

However it is to be noted that of the 30 medical schools currently functioning in the region, only 8 were established before the individual countries obtained their independence. The rest of the schools developed after. In the twenty years following the change in political structure of the region, there was an increase of a little over 20 medical schools or an average of about a new medical school every year. This is perhaps consonant with the post-war development of the region. In contrast, the developed countries in Europe and North America show only a minimal increase in the number of medical schools; for example, the United Kingdom in the period 1955 – 1967 showed no increase in number of its 27 schools, France actually had one school less, Netherlands increased the number of schools from 6 to 7 and the United States of America had five more schools added to its existing 85. A peculiar exception is the Federal Republic of Germany which in spite of it enjoying a favourable doctor: population ratio of 1:670 in 1960 with 19 medical schools, increased this number to 26 by 1967. This rate of growth in the number of medical schools in South-East Asia is remarkable and interesting especially in the background of the diverse cultures and philosophies that characterise the peoples in the area. One common conclusion that may be drawn from this

phenomenon is perhaps the acceptance of the role of scientific medicine in these developing countries.

The Need for Medical Schools

Medical education traditionally and justifiably, is an expensive undertaking and this relatively more so in countries where there are other equally pressing demands for the utilisation of the available economic resources. The question which the medical educator has to answer in the planning for medical schools in the region is whether this should have any degree of priority. The logical answer to this is that economic progress in the region cannot proceed very far without the provision of the basic necessities essential for the progress. Provision of good health services is as fundamental in this respect as the proper use of other natural and manpower resources. It may also be argued that perhaps it is more economical to send suitable candidates to institutions abroad to receive the necessary training than to incur the expenditure of building and staffing a medical school in the region. However this solution can only be reasonable if the need for doctors is small. Where the problem is as pressing as in South-East Asia with the unfavourable doctor: population ratio of 1: 17,000, it would be unreasonable to do this. Furthermore the places for study of medicine in most countries of the world are in short supply and there is great competition for the limited number of places available. At best only a token number can be available at any one time to cater for the needs of foreign students. Sending students from the region would also require a reorientation to the educational system of the host country in order that the applicants for these places in medical schools might achieve an equal footing for favourable consideration. Hence unless a deliberate effort is made to tailor the basic educational pattern of the developing country to fit that of the country in which the training is available, this would put the applicant at a disadvantage. This could only be overcome by an extra period of reorientation which may solve the problem but still results in unnecessary waste of time and resources. In the developing countries of South-East Asia, an important trend is the emergence of an independent primary and secondary school educational system. A medical school in the region will be more in line with this trend.

Because of the benefits of increase in the number of doctors to deal with the medical and health problems of the community, the community in a developing country is encouraged to regard this as part of the dividends of progress, and expects support of such institutions. Psychologically and politically, a failure to provide for a local medical school might be taken as a failure to provide for the basic health needs of the community.

In terms of retraining trained manpower in this area to serve the needs of the component countries, the local medical school would encourage a relatively larger number of graduates to remain in the country after training. If the training was effected elsewhere, there is a greater tendency for a larger proportion of doctors to remain

abroad after their training because of better opportunities. In fact some countries in South-East Asia are faced with this very problem – that of losing potentially skilled manpower because of limited training facilities. Hence the provision of these facilities would tend to discourage this efflux of valuable manpower which the developing countries can ill-afford.

The Medical Education Programme

The medical education programme in South-East Asian universities varies from 5 to 7 years after completion of secondary education. In some of the countries like the Philippines and Thailand a period of pre-medical training at the University level is required for admission to the medical school. The total period of education beginning at the primary school to the time a person can practise as a doctor in the region varies from 17 to 19 years. The course in medicine itself in spite of the various early influences is remarkably uniform in content, there being a two or three year preclinical programme followed by a further three to four year programme of clinical studies in which patient care is introduced. Thus allowing for the differences in approach which are determined by the historical background of the country in which the medical school is situated, it can be seen that the study in medicine is not bound by geographical considerations and in fact has a world-wide connotation. The tendency to categorise the day to day medical practice into Western medicine and indigenous or traditional medicine is therefore inappropriate when applied to the medical education programmes in the region. Such a practice could be in other ways harmful because it creates a barrier in the minds of the people in the region which could adversely affect the educational process on grounds of nationalism to the extremist exclusion of ideas and methods which might have originated from cultures foreign to the region.

Despite the past tendency to isolationism during the pre-World War II period because of the political structure of the region then, the recent trend in medical education practices which has created much interest in the developed countries has also influenced the medical curricula of the schools in the region. If the innovations to existing medical curricula in the region were to be compared, it can be seen that the thinking in this area is remarkably convergent. This is partly due to improved communications on the subject and much more so due to the acceptance of medical training as an international resource. Because of the relatively long period of training and the quality of personnel required to undergo the programme successfully this demands the use of the best type of programme to produce the doctor in the shortest possible time commensurate with the responsibilities in his professional life. This does not imply that the medical education programmes in this region have a limited relevance to the health needs of the country. In fact the contrary is the case where it is considered to be mandatory to apply the ideal educational programme to peculiarities of the country at which the programme is primarily aimed. This is reflected in the stress placed on community medicine

in the area as an important part of the curriculum of the schools. For this reason, as stressed previously, the relevance of medical schools in the region cannot be overemphasized.

To develop the medical education programme in the region would need regional and world-wide co-operation in order to utilise fully the knowledge and available resources in medicine. Therefore the medical schools in South-East Asia must not forget this and their approach must not exclude this potential for this could very easily happen in he surge of nationalism natural to emerging countries. A free exchange of staff, knowledge and resources among the centres of medical education in the region and outside it, is the basic requirement for continual improvement in the programmes of medical education. Isolationism, deliberate or as a result of poor planning is detrimental to the cause of medical education as in any other field.

Some Problems of Medical Education

One of the problems of developing countries is the correct apportioning of its resources and in most instances this revolves around the economic and political return that can be expected from any such investment. As the returns from medical education though large and far reaching are often largely difficult to measure in such concrete terms, the provision of adequate physical facilities and manpower to implement medical education can be a real problem. Failure to do this can stunt the growth of the medical education programmes with the result that only a certain basic minimal health care level can be provided. Reliance would then have to be placed on better facilities outside the region and this would, in many instances, be beyond the capabilities of the majority of the population. Further shortsighted planning which may in some instances be the only solution because of other priorities, must be regarded as only that and the country which is faced with this cannot realistically expect that without the provision of increased facilities it could solve its shortage of doctors. The proliferation of medical schools in the region during the last 20 years is an adequate testimony to this realisation. The question here is how much of the physical resources of the individual countries can be diverted to cater for this needs, and how much of the extra resources available from the more developed countries of the world can be channelled towards helping the countries in this region towards achieving better medical education facilities in the region.

The rapid increase in the number of medical schools poses the problem of provision of adequate manpower resources for the implementation of the educational programmes. This is more so in developing countries where in the past there was very little provision for the planned training of staff for the teaching of medicine. This may be partially attributed to the great need for the practising doctor and because of the shortage of such in the region, the majority of those qualified or having the potential to be teachers were engaged in fulfilling the demands of day to day medical care — and rightly so — so that the development of the academic physician was somehow

neglected and dependence was placed on the availability of such personnel from countries outside the region. With the increase in demand for such staff and the change in the political climate in the region, the countries in South-East Asia are faced with the challenge of providing their own staff for the medical schools which have proliferated within the short period of time. Some schools have been able to solve this shortage of teachers by undertaking a deliberate programme of staff training to fulfil their needs whilst others are content to try their fortune in world-wide competition or have to accept less qualified personnel often on a shoe-string basis to deal with this problem. In time this discrepancy and difficulty may become minimised with the increased output of doctors within the region and better opportunities for some of them to develop and contribute towards the need for medical teachers. This takes time and the problem of developing nations is that they have to undergo accelerated development despite these difficulities.

Another problem of medical education in terms of the need of the individual countries is not only in turning out a number of doctors each year but in working towards the proper deployment of such personnel. This is not a problem peculiar to the countries in the region but because the standard of health is lower than some of the more developed countries this problem is somehow magnified. There is a tendency for gravitation of trained personnel in a developing country to the urban areas such that the places remote from such centres would only be poorly covered. This problem is not exclusive to trained medical personnel but applies to personnel in other fields as well. This is a problem which has partly to do with correct motivation of the doctor and medical schools may be able to play a role in the correction of this. Where this has not been particularly successful, countries in the region have resorted to legislation relating to compulsory service as an interim measure to alleviate the difficulty. Medical schools which have incorporated in their programme a period of training in rural areas are perhaps in a better position to motivate the future doctors in this direction.

So far the discussion has been on medical education as it directly pertains to the training of doctors. However modern medical care is very much a team project in which the doctor is the leader of a number of less highly trained but nevertheless important members of the team. These are the medical auxiliaries without whom proper comprehensive medical care cannot be carried out to the extent that it should. Medical education programmes which are centred on the University structure have sometimes neglected this aspect of medical education in that they have not concentrated on this in the same way as they have done in the training of the doctor. Shortage of medical auxiliaries is as pressing a problem as the shortage of doctors in the region and it is important that adequate attention be paid to this deficiency in the total medical educational programme of the countries in the region.

The Future

The rapid growth of medical education in the region despite its various setbacks is an indication of the potential of the peoples in the South-East Asian region to look after themselves in medical education. Although it is a long way to go before the need for doctors can be adequately filled the start has been promising and the investment made will continue to pay dividends for many years to come. In the meanwhile what else can be done ? There is no doubt that the need for more medical schools will continue in spite of the growth in the past twenty years. However the resources available for more schools will increasingly be limited. This might perhaps be the force which will drive the countries in the region towards the need for sharing of the existing and future resources in the training of doctors. Specialised postgraduate institutions have been started on a regional basis and will perhaps be the future pattern of medical education in the region. Barriers to movement of staff and students between the various medical schools in the region are slowly being removed. Development of research into health problems peculiar to the region promises to attract attention of the more developed countries in terms of resources and personnel.

Thus from humble and diverse beginnings medical education in South-East Asian Universities is shaping up to take its stand in the international comradeship of medical education. Its impact will increasingly be felt in the Seventies and may show the way to greater regional and international co-operation for the benefit of mankind.

PART III

THE UNIVERSITY & THE COMMUNITY

THE GRADUATE IN MALAYSIAN SOCIETY

by

K. K. Nair,
Faculty of Arts,
University of Malaya,
Malaysia.

It is important that every graduate in our developing country realises that he or she is an intellectual in his or her own right, and that by virtue of this privilege he or she has a high obligation to meet. The graduate in contemporary Malaysia cannot be a weed in the pavement of Malaysian life nor can he remove himself from everyday practical living by steadfastly hoping that others will do all the thinking and solving of urgent crucial issues facing the nation. He is very much a part of the drama with a role to play and his cue to enter the stage is his graduation. The spectators are the millions of people who have paid him to play the role and who have attached a high premium to his intellectual propensity to resolve their specific problems.

It is in realisation of the fact that every graduate is an economic and social asset to the nation that each student in the university is carefully brought up in the various academic and extra-curricular incubators of the university, made to read the classics, partake in the genuine community life of the university, taught to nurture good taste, arrive at honest thought, attain a culture and way of thinking that is democratic. The university is in all its aspects a microcosm of Malaysian society, the interval between the fully regulated work and life of a student and the great moment when he must enter the human and material world outside the campus and grapple with the problems that he with no doubt will encounter. It is vital therefore that students in our universities learn to adjust themselves to the geographical, social and intellectual environment and benefit from the great variety of activities that go on in the universities. As a microcosm of our multi-racial Malaysian society, the university affords a chance for its students to meet peoples from various parts of the country, perhaps parts of the land that they had never been to, to meet and mix freely with those coming from different racial origins, from varying economic levels of living or to meet and exchange ideas with people with varying ideas and ideals. We would like to feel that the graduates we have been furnishing to the stream of national life and a whole student generation we continue to powerfully impregnate with these ideals have not lost sight of their mission in life — to serve, rather than be served.

No doubt when the rituals of the final examination are over and the ceremonial convocation is solemnly declared closed the first thought

that occurs to the hardworked graduates is to relax in a comfortable job. The sad fact however is that many overjoyed graduates feel that their life's mission ends with the degree scroll. I am not overstressing the point if I add that there are graduates in this country who would rather seek ways and means of seeking a comfortable living whenever the opportunity to do so patently offers itself than to play their legitimate role as intellectuals in a developing nation. The metaphors of spring nights and fairy palaces. which many a graduate in his hours of frustration dreams about, continue to be centre of all his talk: if these spring nights and fairy palaces were meant for the nation then no one will have anything to object to, but in the main it is a dream of personal gain. Perhaps it is fair to expect the graduate as an intellectual to work for the good of the nation and thus repay the nation for what privileges it has bethrown the intellectual.

One of the reasons for this, where it exists, is I feel largely due to the fact that in a competitive situation whatever the idealism behind university education, most parents who send their children to university do so for bread — and — butter reasons. The students who crowd the university corridors and lecture theatres are not just there for an education. For many types of employment a University degree is gradually being regarded as an essential condition. This has naturally led under-graduates to see the degree not as the symbol of an education but as a passport for what they consider to be honourable employment. Under-graduates have aspirations of obtaining well-paid jobs after graduation, whether it be the private or public sector of the economy. The image that inspires our students is still that of an educated elite of bygone days, enjoying a middle class standard of living many times higher than the per capita national income. This is the way in which the so-called "revolution of rising expectations" works in most developing countries.

In order to play his role effectively in the drama of human life in the future of this country, the graduate has to prepare himself in three ways. In the first place, he has to understand the sociological problems of Malaysia's multi-lingual society and he will not be worth his salt if he did not do something at least to contribute towards finding a workable solution to the problems of race, culture and nationalism. I know that there is no magic solution to inter-ethnic problems but I am convinced that our graduates will not be useful to Malaysian society if all they did was simply employ their practical and academic skills that they have learnt at the university to further their own careers. I should think that leadership in thought and action is a moral responsibility of every Malaysian graduate and that no Malaysian graduate can afford to measure the merit of his performance by a mere reference to the competent way in which he is discharging his professional duty. A physician cannot afford to do nothing more than merely examine and cure his patients. Besides the practice of his vocation, he owes it to himself and to society a thorough knowledge of social conditions, rural and urban problems, economic imbalances in our socio-economic system, socio-cultural

problems. In other words for a graduate to play his full social role in his community he must relate himself to his society and having grasped its problems express what he perceives or experiences about that society, its strengths, its weaknesses, its internal ordering and its physical and social well being. He cannot afford to draw himself away from the social and human problems of his contemporary society.

In the second place, one of the most immediate tasks of the graduate in Malaysia is the bringing about of a positive attitude towards Malaysian nationalism to counter the pulls of communalism, communal culture and language barriers. In doing this he must at all times be realistic in his approach. He cannot wear the long thin face of an idealist in search of an utopia which can only be a figment of his imagination. The problems of race and racial tension are not problems peculiar to our country alone. They have affected life and politics in the most democratized countries of the world and we have seen in the case of Japan and Korea which have more or less homogeneous populations there has been no lack of internal conflict. The new nationalism I speak of must therefore be a nationalism which aims for more than merely achieving a sense of homogeneity. There is today a great disparity in levels of economic power and educational achievement between the privileged and underprivileged sections. The new nationalism must first address itself to the economic problems and discover how the social structure can be democratized through economic reforms. If the racial problem is to be reduced there must certainly be greater social justice and equality and the results of development must become the prerogative of not one social group or another but must be evenly distributed among all the social groups, among all the under privileged sections of the community. Once the economic problem is well under control then there will be less of the "We" and "They" doctrine.

Leadership in thought and action is a moral responsibility of the Malaysian graduate, a challenge to his legitimacy as a member of the elite group. Malaysian writers and humanists have a special role to play in bringing about a positive attitude towards Malaysian nationalism. It is their moral responsibility to influence social change, perhaps play political roles, in order to ensure the development of a common culture and a sense of common identity. In the History of early American civilization one is often surprised when one observes how it evolved out of diverse ethnic groups and how much this owed to the gigantic intellectual tradition of the early teachers, clergyman and journalists. We need no special reminding that in Asia it was the intellectuals, or at least a significant proportion of them, who first engaged themselves in the politics of the anti-colonial movement through speech making, pamphlet writing and journalism, and it was they who were most seriously concerned with the rediscovery and glorification of the cultural past of this part of the world. It was the intellectuals who moved straight from school, or university education abroad, into the rank of the freedom-fighters, into open and secret independence movements and into prisons which turned out to

be seats of advanced study in revolutionary nationalism. They detested the unsympathetic isolation from affairs concerning the management of their country and professed a cultural and political nationalism and articulated the hopes and aspirations of the colonised.

Now, in the post independence days, graduates have an even greater part to play in spreading a new sense of nationalism and purpose. They are the mature, well-integrated, cultured persons with a full understanding of themselves and their place in society and it is up to them to set the tone of the future Malaysian society, to leap over the boundaries of race, to have and to install in others the virtues of humanity, fellow feelings and a vision of the future. It is up to them to initiate the making of modern responses to traditional problems, build a fraternal Malaysia and impregnate a whole generation with the need to fashion the national life along certain lines of thought and action.

In order that the graduate is permitted to make his full contribution towards the society in which he lives, it is necessary to allow him certain freedoms or privileges within the limitations of the law. It would be useless to expect the graduate to play a positive role in fostering a new sense of nationalism without allowing him the leave and the opportunity to do so. He must be allowed to express his points of view on any matter affecting the life of the country and he and the graduate societies must be allowed to establish a dialogue with the more influential elements in the country. In short, the graduate cannot play his role in society unless he is allowed the freedom and the opportunity to do that. If we want a free. flexible, and progressive society the intellectual or intellectual institutions must be allowed the leave to interpret their service to society in such a way that, of their own volition, they meet the legitimate needs of the community. If the graduate is expected to plan an effective role in the future of any given society there must always exist in that society an element of intellectual freedom in the presence of which alone the human spirit can fourish and come to fulfilment.

In the third place, the graduate might be expected to play a fair role in matters regarding the formulation of educational policies, in the development of higher education and in matters concerning administration and teaching at the university. One of the ways in which graduates can perform this responsibility best is through active participation in the meetings of the Guild of Graduates or through their membership of Graduate Societies. The Guild of Graduates meets annually and receives from the Vice-Chancellor a report on the University for the previous year, and it can make representations to the court and consider matters submitted to it by court and express its opinions upon such matters to the court. These are provided for in the statutes of the University and it will be a great pity if graduates did not make full use of the Guild of Graduates to keep in touch with the university and deliberate on matters affecting university administration and teaching. After all, all graduates of the university

automatically become members of the Guild and that body has been entrusted with certain powers.

If it is fair to assume that a university education develops the individual, his mental faculty, his intellectual fibre and his overall social and aesthetic values, then I think it is fair to expect the graduate to function effectively and creatively as a citizen of a democratic nation.

EDUCATION: THE CORNERSTONE OF SOCIO-ECONOMIC DEVELOPMENT, WITH SPECIAL REFERENCE TO THE ROLE OF INDIAN UNIVERSITIES

by

Werner Draguhn,
Institute of Asian Affairs,
Hamburg,
Federal Republic of Germany.

Introduction

A modern, continually and sometimes even fast changing world raises a great number of questions which turn out to be almost problems that have to be tackled by human beings, individuals or the community as a whole. While this statement applies equally to all countries north and south, east and west, the problems to be urgently solved differ from region to region according to the occurences and developments taking place in single states.

If we take the economic viewpoint in some countries of Europe and especially in Germany we have to find out ways of how to handle a high pressure economy, cooling down a boom on one side by carefully avoiding a recession or even a slump on the other. In Asian countries, with few exceptions one has to look for measures to get the economy moving and to put it on a path of self-sustained growth. In both cases, the present European and the Asian one, decisions and actions have to be taken by individuals or groups at the top as well as at the bottom of the social hierarchy the results of which largely depend on intelligence and knowledge, both of which are to a great extent influenced by the prevailing educational standards. Universities can and have to play a decisive role in this context.

For closer consideration let us take up the case of India, the most populated, democratically governed country in the world. The Indian economic situation is characterized by a fast growing population which nearly outruns the growth of the GNP despite a great deal of foreign assistance and serious efforts as well as good results in many fields within the country itself.[1] As mineral resources for industrialization, large parts of fertile soil, an abundant labour force, basic know

1. See: "Partners in Development," **Report of the Commission on International Development,** German Edition, Wien, Munchen, Zurich 1969, Appendix i pp. 75/76.

how and at least a not negligible amount of financial capital [2] have been available for centuries, the question arises whether the so called human factor in economic development is the barrier to growth.

For the following analysis let us assume that according to the great influence of the Indian cultural heritage, especially the religion of the Hindus, the caste system and the joint family, the outlook of the majority of the Indian population is characterized by that often cited "otherworldliness" which does not attach much value to the material goods of this world but sees its ideal more or less in the life of an ascetic.[3] Given this over-simplified picture two questions arise :

1. Which characteristics of the individual are theoretically necessary for socio-economic development ?
2. Which is the best possible way for stimulating or creating these characteristics ?

The Model

Looking for the forces of industrialization and the rise and development of capitalism in Europe, the German sociologist, Max Weber discovered what he called the "spirit of capitalism".[4] Sociologists and economists of our days dealing with growth problems of developing economics use terms like "ability to invest", "growth mentality",[5] "will to economize" [6] or in negative term "pathetic con-

2. Ministry of Information & Broadcasting, Govt. of India. (ed.) — **India 1968 — A Reference Annual,** Publications Division, Ministry of Information & Broadcasting, Govt. of India, New Delhi, 1968.

3. See eg. Sovani, N. V. — "Non-economic Aspects of India's Economic Devpt." in **Administration & Economic Devpt. in India,** ed. by. R. Braibanti & J. J. Spengler, London 1963, pp. 260 — 280 & the literature referred to :-

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5. HIRSCHMAN, ALBERT O. — **Die Strategie der Wirtschaftlichen Entwicklung** (The Strategy of Economic Devpt.) Stuggart 1967, pp. 37 — 39, 127.
6. LEWIS, W. ARTHUR — **The Theory of Economic Growth,** 2nd ed., London, 1966, pp. 23 — 44.

tentment" as the Indian economist and educationist V. K. R. V. Rao does.[7] Following this way of thought we consider a dynamic development consciousness to be the most important positive characteristic of the economically active individual and conditio sine qua non for any economic development. In order to define more precisely this term, which means a positive inclination towards economic development and is the opposite of tradition consciousness we shall put it into the center of a system of connected terms which together form something like a small model.

Above all, any development consciousness is characterized by its motive power, the striving for material ends or as Nehru termed it, the acquisitive instinct[8] or we may even say the profit motive. The dynamising strength of the development consciousness depends on the outlook of the individual. In its weakest form it is directed towards earning the bare means of subsistence or towards preservation of the given economic and social status. This is equal to a static society, traditionalism or "limited horizons" as Lewis[9] calls it. In a stronger way it may be directed towards an improvement of the personal economic situation or even higher, towards an increase in social status via economic prosperity.. Finally, in its strongest form, economic and political power may be the aims of the acquisitive instinct. All these latter varieties indicate dynamic elements, a mobilization of wants to which Ghandi was so much opposed, but which are essential for economic growth.[10] As soon as one economic target is reached, a higher one appears.

But a strong profit motive being directed at more than just preserving the given status alone will not be sufficient if a dynamic development consciousness is intended to produce optimal results in any economy. An additional number of objective characteristics, to which we shall refer later as well as certain subjective necessities, which are directly related to the individual have be taken into account. These subjective necessities are more or less developed characteristics or abilities of the single person which are to some extent based on talents but which can to the larger part be moulded and enforced by what we might call a general personality education.

In a country that during its recent history up to our days has been confronted with alien values, the social objectivity of its popu-

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7. RAO, V. K. R. V. — "The Human Factor in Economic Devpt." in **Essays in Economic Devpt.,** ed. by V. K. R. V. Rao, Bombay, 1964, pp. 158, 164, 166, 172.
8. Speech delivered at the National Development Council Meeitng on November 9, 1954, reproduced in: Planning and Development, Speeches of Jawaharlat Nehru (1952 — 1966) Delhi 1956, S. 17.
9. LEWIS, W. ARTHUR — op. cit., pp. 29 — 31.
10. GANDI M. K. — Hind Swaraj", in: **The Collected Works of Mahatma Gandhi,** Vol. 10, Delhi 1963, p. 37:
"We notice that the mind is a restless bird; the more it gets the more it wants. and still remains unsatisfied.....Our ancestors, therefore, set a limit to our indulgences."

lation is rather important[11]. It is the general ability to combine new outlooks organically in a progressive social and economic change with values and behaviour patterns which originate from ancient cultural tradition. This means a continuous checking whether the traditional and the modern way of thought and action, if combined, are not contradictory, and if they are contradictory to find a rational solution. A negative example may be the joint stock company which stands for economic rationality, anonymity of capital-ownership and a possibility to mobilize financial resources from a greater public but inadequately to its possible functions may be the judicial framework of a family business where caste ties may prevent rational economic leadership. Another negative example is the successful entrepreneur who buys landed property which may not be economically profitable but who by doing so adds considerably to his social prestige.[12] In both cases there is no organic combination of modern economic facilities and behaviour with traditional values judged by standards of possible efficiency.

Furthermore, a general open-mindedness and a general mobility of mind are necessary to be able to follow social and economic developments and adapt oneself rationally to new situations. More especially directed towards the entrepreneurs but also important for the greater cooperating public are characteristics like the ability to organize and to make experiments[13], a pioneering spirit and a readiness to take risks. Using these characteristics we may distinguish two sections of economically active individuals with a rather high profit motive: often found traders and money-lenders from entrepreneurs in command of industrial undertakings. The fact which prevents traders and money-lenders to change over to industrial production is the possibility to conduct traditional bussiness with a limited number of employees avoiding manual work and unusual risks. On the other side already a small industrial firm means a continuous adaption to changing knowledge about products, experimenting with new materials and designs and to organise production as well as purchase of raw materials and marketing of the manufacture. As turnover of capital is rather slow compared to trade, more planning is needed, and more often risks of various kinds have to be considered[14].

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11. For some subjective characteristics see: Behrendt R. F: **Soziale Strateqie fur Entwicklungslander** (Social Strategy for Developing Countries), Frankfurt 1965, pp. 186 — 209.
12. Ibid. p. 280.
13. The ability to make experiments should bridge the often existing gap between theoretical knowledge and practical application under different conditions. Sigueira writes: "Our highly educated men and women are unable to put their knowledge to constructive use, they lack the power of applying principles to new situations, they cannot adopt their theoretical experience to the life around them, they do not feel the instinctive urge of true learning to communicate itself, and to improve and create." See: Siqueira T. N.: **The Education of India,** 4th edition, London, 1952, p: 266.
14. HOSELITZ BERT, F. — **Social Aspects of Economic Growth,** Glencoe 1960, pp. 149 — 151; Lewis W. Arthur, op. cit. pp. 42 — 44 and compare the list of general requirements in: Myrdal, Gunnar. **Asian Drama — An Enquiry into the Poverty of Nations,** Vol. I, New York 1968 pp. 61 — 62.

Two other subjective characteristics which are necessary for a strong development consciousness are a constant readiness to think and an ability to make out aims and find ways or measures to reach them. This more or less stands for rational analysis as a basis for action. In a changing world one has always to be ready to follow different developments in thought and to connect these with one's own ideas. In addition there should be an ability to ask questions in order to find out differences with one's own outlooks or merely to understand developments and by doing so creating the basis for a sane takeover of new thoughts[15]. This readiness to think has to be closely followed by a readiness to communicate that has to go beyond the barriers of family, kin and caste. All this will help to identify one's own firm position in the middle of continuous change.

Finally an optimal development consciousness cannot do without self-discipline, a strong feeling of personal responsibility combined with an ability to delegate responsibility when reasonable and a sane amount of self-confidence[16]. Without self-confidence no pioneering entrepreneur will get far.

Now let us consider what we called the objective characteristics of a development consciousness which are more closely connected with each other. If a strong development consciousness is to produce practical results in economic life it has on the one side to be supported by what we may term energy, the basis of all activity, and on the other side on rational economic action. By the latter we understand the ability to tackle an economic problem in the best possible way. We exclude energy[17] from our further considerations and find out that rational economic action has to be based on logical thinking and on economic knowledge without which logical thinking would lose its practical platform. This economic knowledge again may be separated into knowledge, including what may be described by the three r's, basic history, geography etc. and special knowledge. While basic knowledge enables the individual to gather information, to calculate and to note down economic facts, special knowledge does not only concentrate on business, banking and industry but also covers an understanding of the economy as a whole. Logical thinking needs rationality and the ability to think which depends on individual intelligence.

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15. HARBISON, FREDERICK — "The Prime Movers of Innovation," in: **Education and Economic Development,** end. by C. Arnold Anderson and Mary Jean Bowman, London, 1966, p. 281.

16. The University Education Commission headed by Sarvapalli Radhakrishnan wrote: "Many of our students are taught to assume that free-will and personal responsibility are illusions.....". See: Report of the University Education Commission (December 1948 — August 1949), Vol. I, reprint, Delhi 1962, p. 34.

17. Here arguments like the influence of race, climate, public health and hygiene as well as standards of nutrition come in which would take us too far. See e.g.: Benjamin Higgins: Economic Development: Principles Problems and Policies, 2nd. ed. New York 1968, pp. 209 — 211, and Gunnar Myrdal, op. cit., Vol. III, pp. 1553 — 1619.

Looking back at the small model we have just sketched we can immediately realize its highly theoretical character and the interdependence of many subjective and objective characteristics. In daily life we will hardly find anybody in command of an ideal development consciousness. But it will be already enough if the motive power and the different characteristics are partially given so that they can work by combination in a cooperating group[18].

The strategy

As we have tried to answer the first question related to the characteristics of the individual theoretically necessary for socio-economic development we may now turn to the second one : which is the best possible way for stimulating or creating this development consciousness ? The analysis gone through above will be of great help.

It is obvious that the "human factor" has to be influenced, modified or changed to be able to continuously adapt to a changing world and actively initiate economic development. If we follow this line of thought it will lead to a cultural change in the Indian environment of an unpredictable size. Looking back at the last 200 years of Indian history we may realize that due to various reasons the clash between two different cultures, the Indian and the English, gave lots of stimuli for a development consciousness and a cultural change[19]. But no drastic change did result, mainly because views were adapted or not but there was no combination of aspects from both cultures on a larger scale. The result was a dualistic society but no distinct new road. Gandhi, trying to find an Indian way out of this delimma did not succeed. His ideas lost ground as soon as independence was achieved.

Taking up our question again at this point we may say that a development consciousness, or in the larger context a sane cultural change can only be brought about or stimulated by the country's own educational system in the broadest meaning of the term. This is the only existing agency that reaches children and young people in a formative age and that can, in cooperation with teachers and students, find the best way of a cultural adaption in a changing world.

Coming back to the need for a strong development consciousness, a basic and special education on various levels will promote basic and special knowledge and be able to stimulate logical thinking and rational economic behaviour. A modern personality education will

18. This small model, working on the profit motive, may be called a capitalistic one. It may easily be changed into a socialistic model by changing the acquisitive instinct into "socialistic initiative" or something like this. The following argumentation will remain essentially the same.
19. We may think of British self-interest practised by the East India Company and its employees, their influence on the cultivation of new products, the free trade policy, the establishment of a far reaching administration, the construction and administration of railways, the judicial system etc.

help in creating the subjective characteristics of a strong development consciousness as e.g. social objectivity, general openmindedness, an ability to organize and to make experiments, a pioneering spirit, a readiness to take risks, a readiness to think and to rational analysis as well as to ask questions and finally self-discipline, personal responsibility and self confidence. General education on all levels can create new attitudes and values which are genuine ones, that is to say which have not just been superficially adopted from other countries that are by chance economically more advanced and which therefore do not play any fundamental role.

After pointing out the strategy of how to create a strong development consciousness we shall now look at the Indian educational system and try to find out which role it has played so far, which, in other words, means a confrontation with the Indian reality.

Reality

The Indian educational system has been deeply influenced by the cultural environment that is to say mostly by the two religions dominating the country: Hinduism[20] and Islam[21]. Both confirm the traditional outlook and learning by heart was stressed more than understanding by discussion. The introduction of the British system, guided by the self-interest of the colonizers, more or less aimed at the production of government employees to help to keep the vast administration running[22]. The so-called filtration theory which was adopted when the question of mass education or education of a relatively thin upper class had to be decided was less expensive but could not be designed to have education filtering from the upper classes to the masses to a larger exten[23]. The following grant-in-aid policy was of a more liberal character but could not change the picture. It was an alien framework which had to be filled by Indians.

Despite the fact that India can point to outstanding personalities in political and economic life like Gokhale, Ranade, R. C. Dutt and others, the educational system was more or less an unhappy compromise. The introduction of the English Language, especially for University education, brought the advantage of easy information and

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20. As to the influence of Hinduism on the traditional education in India see: N. C. Bhattacharyya: The Hindu Theory of Education. in Australian Journal of Education, Vol. 5 (1961), p. 123 ff.

21. For the educational system of the Muslim in India see: The Imperial Gazetteer of India: The Indian Empire, Vol. 4. Administrative, new edition, Oxford 1907, p. 408; Philip Hartog. Some Aspects of Indian Education Past and Present, London 1939, pp. 48 — 49, F. E. Keay: A History of Education in India and Pakistan, 4th. ed., Calcutta 1964 p. 108, P. L. Rawat: History of Indian Education — Ancient to Modern, 3rd. edition, Agra 1956, pp. 105, 108; K. S. Vakil and S. Natarajan: Education in India, 3rd. edition, Calcutta 1966, pp. 34 — 35.

22. MISHRA, B.B. — **The Indian Middle Classes — Their Growth in Modern Times,** London, 1961, p. 149.

23. HARTOG, PHILIP — op. cit. p. 16 and Mayhew Arthur: **The Education of India,** 2nd. edition, London, 1928, pp. 92, 95.

communication but the far greater disadvantage of having to develop lines of thought by means of an alien tongue, a difficulty for any student in the world. The subjective and objective characteristics of a development consciousness were with the exception of basic and special knowledge, hardly stimulated.

The post independence developments on all levels of education had to start from this basis which despite education commission reports realizing the difficulties very well[24] could not be changed effectively because of the numerical size of standing educational institutions including teachers and students on the one hand, and very limited financial resources on the other. The developments were in quantity, not in quality, multiplying the principal problems by growing numbers of students. The language question and the explosion of knowledge everywhere aggravated the situation.

The rather enormous quantitative expansion on different educational levels may be illustrated by some figures. Despite the fact that original targets — especially in primary education — were higher, results were considerable. The number of pupils in primary schools in classes I — IV rose from 1950/51 (beginning of the first year plan) to 1965/66 (end of the third plan) from 19,15 million to 51,50 million. That means a percentage increase of children from 6 to 11 years of age attending primary schools from 42,6% to 78,5%. The original target of the fourth plan for 1970/71 was even 9,5 million pupils or 92,2% of the age group 6 to 11 years attending primary schools. The growth of secondary and university education was in line with these developments[25]. Even if we consider the fact that enrolment figures can be problematic, achievements were respectable, but standards seem to have suffered.

Let us now focus our attention on the highest stage of education, the universities, which in any case have to catch up first with the problems of a continuously changing world, and let us try to find out whether the characteristics of a strong development consciousness were stimulated. The Education Commission 1964—66 paying special attention to education and national development notes: "There is a general feeling in India that the situation in India in higher education is unsatisfactory and even alarming in some ways, that the average standards have been falling and that rapid expansion has resulted in lowering quality. The examination results, the reports of Public Service Comissions, the views of employers and the Assessment of teachers themselves, the results of research done — all seem to support this conclusion... In many of the weaker colleges and universities, a majority of teachers teach mechanically and listlessly. The subjects

24. See e.g.: **Indian Statutory Commission, Interim Report,** London, 1929, **The Report of the University Education Commission,** op. cit. and most recently: **Report of the Education Commission 1964 — 1966 — Planning and National Development,** ed. by Ministry of Education, Government of India, Delhi, 1966.

25. **The Fourth Five Year Plan, A Draft Outline,** ed. by Government of India, Planning Commission, (Delhi 1966), p. 326.

in which they lecture do not often involve their intellectual passion. There is little enthusiasm for learning or discovery of new truths... The situation with regards to the students is no better... they have little experience of independent study, their curiosity is unquickened and learning for them is mainly a matter of mechanical memorization. There is, as a rule, little discussion of intellectual matters with their teachers or fellow students; their main duty is considered to be to attend uninteresting lectures usually given in a language which they understand inadequately"[26].

To these statements we may add the opinion of two rather well-known Indians coming from different sections of society: the late Zakir Husain, most prominent educationist and politican, and S.K. Kirloskar, the industrialist. University teachers far too often carry along old notes from their former teachers and do with "incomprehensible self-assurance"[27]. Universities with some exceptions have have become ".....places of instruction and not of education, places where information is imparted, information reproduced, and information forgotten; they are not places which curiously and deliberately try to create conditions in which the mind may grow and develop".[28] Educationally productive work that is manual or mental activity which brings about new ideas is rare. Not one-sided lecturing but more discussion is needed[29]. Instead of facts the underlying method and logic has to be developed. The spirit of enquiry will have to be stressed so that examinations turn away from being the test of a student's memory to a test of his true understanding, and chance will lose its unduly significant role[30].

From the point of view of the industrialist there is no need to employ only engineers and technicians. A Sanskrit or an English graduate in many cases can be used as effectively. But the dilemma "chiefly lies with the limited mental horizon of an Arts graduate".[31] The social sciences are characterized as possible hunting grounds for teachers of all sorts because they involve a great deal of value judgement and opinions[32]. A graduate in engineering, filled with knowledge about steam engines which is already inadequate for Indian circumstances thinks to be able to take a job without learning while technical progress everywhere advances rather fast, which makes continuous rethinking necessary. Imagination and initiative are even needed in accounting".[33]

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26. **Report of the Education Commission 1964 — 1966,** op. cit. p. 278.
27. HUSAIN, ZAKIR, — "University as a Corporate Enterprise," in: **Vijnan-Karmee,** Vol. VIII, No. 1 March 1966, p. 11.
28. Ibid. p. 12.
29. Ibid. p. 14.
30. RAMAVATARAM, K. — "Science Teaching in Indian Universities," in: **Vijnan Karmee,** op. cit. pp. 33 — 35.
31. KIRLOSKAR, S. L. — **Universities and the Training of Industrial and Business Management,** R. R. Kale Memorial Lecture, Poona, 1967, p. 4.
32. Ibid, p. 5.
33. KIRLOSKAR, S. L. — **Universities and the Training of Industrial and Business Management,** R. R. Kale Memorial Lecture, Poona 1967, p. 10 –11.

These quotations provide a rather clear picture of the situation at Indian universities which, of course, in some aspects might be overstressed. Without going into further detail it becomes evident that hardly any of the characteristics of a strong development consciousness are present or stimulated. The propagation of economic knowledge, basic and special, is hardly catching up with the general discussion in other countries. Logical thinking which means rationality and an ability to think is not sufficiently imparted. On the other side of our subjective characteristics the general situation at the universities of the country is no fertile ground to create social objectivity, general openmindedness, an ability to organize and to make experiments as well as a pioneering spirit and a readiness to take risks. A readiness to think and the ability of logical analysis to make out aims and fund measures to achieve them is lacking to a large extent. Self-discipline, feeling for personal responsibility and a sane self-confidence will not grow easily in such an environment. The general education which may be a catalyst of modern and traditional behaviour patterns and values has difficulties in creating new dynamic attitudes which may motivate daily work. So we may summarize that the education imparted at the university level is far from stimulating and developing the characteristics of a strong development consciousness, necessary for socio-economic development.

Strategy and Reality: The Need of a University Adopted to a Changing World

After having sketched the above picture it is obvious that a strategy designed to bring about socio-economic change cannot possibly tackle the problem by working with additional forces at all levels of the educational system. But where to start? Which level should be selected?

It would be only too reasonable to begin at the bottom so that via a good primary school education the foundation for the secondary schools improves and that an improved secondary education will positively influence the universities. But looking at the fast expanding primary level with about 600.000 untrained teachers the problem [34] seems to be too difficult to handle. As there is a lot of criticism about secondary school teachers too, it seems to be practical to start at the top of the educational ladder where the numbers of teachers and taught are the smallest at the university [35] This would bring the additional advantage that teachers, researchers and men for services (business as well as administrative) turned out in a better quality by the universities, being in command of a strong development consciouness, in leading positions will be able to create a cummulative effect by being themselves

34. According to estimates of the Planning Commission. See: **The Fourth Five Year Plan, A Draft Outline,** op. cit., pp. **317 — 319.**

35: But the additional difficulty is, that according to conservative estimates, the number of students will rise from 1.5 million in 1964 — 65 to about 3 million in 1975 — 76. This makes the task even more urgent. See: Shah, A. B. — "Higher Education: Problems of Expansion", in **Higher Education in India,** ed. by A. B. Shah, Bombay, 1967, p. 7.

teachers of the various characteristics of a strong development consciousness.[36] This would mean something like a new filtration theory, which, according to its design and special purpose would be able to bring about better results than the old one, which was not made up to promote socio-economic change.

The argument against this strategy could be that developing the human factor in economic development by creating a strong development consciousness would result in giving up what is meant by university and university education in their deeper sense. But this is not true. If we look at our small model we can easily see that most subjective and objective characteristics necessary for a strong development consciousness are in line with the aims of university education in its proper, original sense. Only a few like e.g. the profit motive would have to be changed into something like a readiness to co-operate and special economic knowledge might be left to the economics or commerce departments.

This line of thought would create holders of a university degree who would not only rely on their certificates but according to their mental abilities could easily adjust to changed circumstances,[37] and continuously adjust their own university to change. This too would solve problems of failures in manpower-planning in a simple but rather effective way. This brings us back to our introduction where we asked to solve the different and permanently changing problems in a modern world. The initiative has to come from the universities themselves in close co-operation between teachers and taught, where the teachers should play the prominent role. In Germany, unfortunately, university teachers did not realize the necessity of change on their own campusses. This fact played the initiative into the hands of rather immature but radical students who, as the example of the Free University of West Berlin shows, created something where proper research and objective teaching are hardly possible, something which nobody can really have wanted.

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36. Television, e.g. as a means to mass education will only be efficient if programs are drawn up by local experts who have the necessary qualification for this job.

37. Problems like educated unemployment would be solved to a considerable extent automatically.

THE UNIVERSITY AND NATIONAL DEVELOPMENT

by

H. C. Blaise,[1]
Visiting Professor,
University of Malaya,
Malaysia.

Introduction

During the past two decades there has been an 'educational explosion' in Asia. In India alone the number of institutions for post-secondary education increased from 843 in 1950 to 2,185 in 1960. The Republic of China shows an increase from 7 to 29 for the same period.[2] Enrolments at Asian institutions of higher learning have more than doubled during the decade 1960 to 1970. The increasing demand for higher education, along with a rapidly growing number of secondary school graduates has forced both governments and universities to expand well beyond what had been anticipated twenty years ago.

Apart from this being a response to social and political pressures, the recognized need for high-level manpower for economic and social development has had a considerable effect on the trend of rapid expansion. I am certain that one or more of my colleagues in the academic fraternity will analyze in the context of this conference the returns to society of investment in education in general and of higher education in particular. Beginning with the pioneering studies by Schultz, Becker, Vaizey and Harbison the analysis of the relationship between education and economic growth has become a topic that has stimulated a considerable number of valuable studies.

In this paper, I want to make some observations about the activities and programs of the university as they relate to national development rather than focussing on the quantity of output or the economic value of higher education. My concern will be with the purposes of university education and with the development of programs and processes that are relevant to the society of which the university is a part.

The Purposes of University Education

In some form or another national legislation on higher education and formal statements on the purposes of individual institutions almost invariably include a reference to the universities' role in contributing

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1. University of Pittsburgh, USA.
2. UNESCO Regional Office for Education in Asia — Progress of Education in the Asian Region: A Statistical Review, Bangkok UNESCO, 1969, p. 143.

to economic and social progress of the nation. Let us examine the various aspects of the potential role of the university in some more detail. The objective 'potential' is deliberately chosen, because few would maintain that their specific university actually fulfills the functions listed below in an optimum manner.

In the first place a university is a cultural institution. In spite of the understandable and even laudable emphasis on preparing the scientific and professional leaders of economic and social progress, the function of a university as a cultural institution remains a central function. Recognizing the urgent task of eliminating poverty, there are those who hold the view that "the fundamental question of any course and its content" at the university is ',does it increase the skill and abilities of the student to perform a developmental task ?" [3] Although even the author of this quotation admits that the developmental criterion should not be applied exclusively, I suggest that the degree of emphasis on utilitarianism advocated by some people both inside and outside academic institutions should be questioned.

In terms of the number of students educated, there is actually and necessarily in Asia a trend toward a much more rapid increase in enrolments in the sciences, technology, and faculties and departments of the social professions than in the arts and humanities. However, a narrow education of engineers, economists, physicians and others considered vital to national progress in the knowledge and techniques of their profession, would be most undersirable.

Many of the developing countries have fairly recently gained their independence. They are still in the process of developing their national identity, of evolving national cultural values, of linking their cultural heritage with the requirements of modern day society. Students, the leaders of society tomorrow, should be deeply involved in this process. Without developing a sound foundation of ethical, moral, cultural and even aesthetic values the future generation may become an effective technocratic corps, but the university will have failed in its cultural mission and true national development will ultimately suffer. Therefore, without reverting the trend of emphasis on developmentally significant fields of study, universities should introduce more, rather than less opportunity, for student in all fields to be exposed to philosophy, history, literature, art and music. The example of the University of Malaya which recently appointed an "artist-in-residence" to develop appreciation and participation in art among the students is a worthwhile example.

The second major function of a university is the preparation of professionals. Although, particularly in American higher education, a difference is made between the professions and the academic disciplines, the preparation of professions is used here to refer to the education in all fields of persons who are expected to assume a leader-

3. WHARTON, JR., CLIFTON, R. — "Revolutionizing University Education: Observations on Southeast Asia", in **International Dev. Review,** Vol. 8, No. 1, March 1966.

ship role in that field and to contribute to its further development. University education differs in this regard from education at other institutions of learning. The teaching, the task of a university is not merely to develop technical competence in the students and to pass on the body of existing knowledge from one generation to the next. To an important extent it is the function of the university and its academic staff to expose the students to the fundamental concepts underlying a particular field of knowledge and to develop within the students a capacity to apply these concepts to the solution of new problems.

Especially in developing countries progress will depend on the innovative capacity of its leadership. The developing countries are undergoing a process of intensive change touching all groups and all aspects of the society. To effectively participate in the process of technological and societal change requires considerable adaptive and problem solving capacity on the part of professionals. Both in course work at the university and in examinations administered to students, much more emphasis needs to be placed on analytic capability and on the application of knowledge than is often the case. The idea that a good student is one who can memorize lecture notes and textbook material and produce this information at examinations is a mistaken notion under any circumstances. In a rapidly changing society depending heavily on the adaptive and innovative capability of its intellectual leadership, emphasis on memorization is all the more futile.

The third function of the university is research. "One of the most important features of any academic code is the unity of research and teaching. A university must be a running stream fed from springs of new knowledge."[4] Although generally acknowledged as a fundamental task of a university, the actual amount and kind of research carried out at universities in many Asian countries is disappointing. Among the many reasons advanced for the lack of research activity, scarcity of funds is usually a leading factor. In addition, there is frequently the inability of universities to recruit competent academic staff fast enough to keep up with the increasing enrolment and the fact that the proportion of senior staff members most likely to be able to make significant contributions to research is small. These senior staff members are too frequently burdened with academic administration burdens. In some countries the remuneration of academic personnel is so inadequate that the academicians find it necessary to supplement their income by simultaneously holding appointments at two or more education institutions, working for the government as well as for the university, etc.

A problem frequently facing university scholars interested in research is the lack of logistical support. During a recent visit to

4. SILCOCK, T. H. — **Southeast Asian University,** Durham, North Carolina, Duke Univ. Press, 1964, p. 10.

one academic institution in Southeast Asia, I was struck by the fact that the research department created as a specialized unit at the institution restricted itself almost entirely of library research; this while both the need and opportunity for field research was evident. The director of research offered two main explanatory factors for his diffculties in encouraging among the academic staff more research activities in general and field research in particular. In the first place, by far the majority of the academic staff members were spending only part of their time at the institution. With the full knowledge and agreement of the institution, staff members spent the balance of their time in other employment or consulting services. Since the research budget did not allow for direct salary compensation, there was little stimulus for research. In addition, the established daily allowances for food and lodging while in the field were so low that even when using very modest accommodations researchers usually had to supplement the living expenses out of their own pockets. From talking with university staff members from other Asian countries it appears that this was not an exceptional case.

Another observed logistics shortcoming is the lack of research support staff. Often even a senior scholar does not receive the necessary support of research assistants and clerical staff, thereby having to carry out himself a host of routine tasks of research project. This lack of logistical support is uneconomical, time consuming, and likely to discourage research efforts on the part of otherwise qualified and interested academicians.

At times one cannot escape the impression that the decision makers on university finance consider research a luxury, as frosting on the cake that should be assigned a lower priority. Governments — the principle sources of university funds — often fail to realize the vital role research can play in providing the basic information necessary for the design of effective policies and programs of development. A little later in this paper it will be argued that, for this and other reasons, research should be assigned a very high priority.

Finally, the function of continuing education warrants emphasis. In countries where the expansion of education is a fairly recent phenomenon, many persons in both the private and the public sector may have risen to responsible positions without the benefit of advanced education. Professional education programs in fields like public administration, business administration, public health, etc. may have been initiated within the last few years. Also, in former times, people may have been trained abroad while today programs exist at the university, which are adapted to the conditions of the environment. It is frequently possible to offer full-time university education over a number of years to only a limited number of students. These factors, in addition to the basic need for all professionals to keep up with the rapidly accumulating and changing knowledge in all fields, makes it of great importance for universities to offer extension programs tailored to the needs of special audiences. In doing so,

the universities should have the will and the ability to be flexible in approaches used in these special programs. This, in terms of content, teaching methods, testing and other aspects. Academic style and tradition are important in the operation of a university, but insisting on putting these special public service programs in the mould of time-honored tradition may defeat both the purpose and the usefulness of the extension programs.

The Need For Relevance

Now we come to the main point of this paper, which is the need for a university to be a relevant institution in its environment. Around the world universities are going through a period of crisis. While priding themselves on being the citadels of knowledge and reflection from which intellectual leadership of the society emanates, the society as such only too often looks upon the university as a teaching institution only. While priding themselves on imparting scientific and professional knowledge to students, preparing to take their place in society, these same students have begun to attack universities for the irrelevance of much of the substances of their learning and of the methods of teaching and testing. As academic members of the university community we cannot deny that some of the charges levied against our institutions contain more than a grain of truth.

In some countries of Asia the universities have thus far been spared the strong and even violent pressures for change currently experienced in Europe and America. We would be deluding ourselves, however, if we would conclude from this that the universities in the unaffected countries are more relevant in the eyes of the society and of the students. Let me suggest some of the glaring irrelevancies of many universities :

Alien traditions : Most universities in Asia have been patterned with regard to their structure, methods and programs after the system of higher education in one of the countries of the West. Thus, we find British patterns in countries like India, Malaysia and Singapore. Dutch patterns (and, more recently, some American patterns) in Indonesia. French patterns in Vietnam and Cambodia and American patterns in the Philippines. For newly established institutions the entire staff is often educated in one or the other academic 'culture' and the new institution strongly reflects the university style and content of the country or even institution where the staff was educated.

It seems somewhat peculiar that, at an Asian institution of higher learning, one can get into a lively debate about the supremacy of the British versus the American tradition of higher education, or vice versa. It is usually forgotten that the respective systems of education of Europe and North America have envolved not as the result of objective and universally valid scientific inquiry into the optimum approaches to university education. Rather, the patterns of education that evolved were a result of national and Western

philosophical orientations of national and local, social and economic preferences and priorities. The relative emphasis on different aspects in fields of knowledge as taught at given universities is frequently as much a function of the relative position of influence of some senior academicians with their own personal interests as it is a function of the importance of those respective aspects to the given field of knowledge.

When one analyzes the number of hours a student of economics spends at the various universities of one country in courses of mathematics as compared with economic history, macro-economic theory, money and banking, and the other building blocks of education in that field, then it becomes clear that even within that one country the degree of emphasis on the various subjects can differ greatly. There is nothing inherently wrong about that diversity, provided the traditions, fads, fashions and preferences are not exported wholesale to a university where the social, cultural, historical and economic circumstances differ considerably from those of the country where the pattern originated.

Even in Great Britain the tutorial system, the "whole world of university myths in which godlike tutors dispense gallons of sherry and coffee, and undergraduates full of intellectual promise and eager for learning, spend sunny afternoons in punts and cosy winter evenings with the Greek philosophers or in talk such as graced the salons of eighteenth century Paris or the Bloomsbury of Virginia Woolf"[5] has become a method open to question and criticism. All the more reason to question its relevance and adequacy when courses at Asian universities with an enrolment of one thousand students are subdivided into tutorial groups of fifty to sixty students under the gudance of part-time tutors whose qualification is little more than they may have taken a similar course a few years earlier.

It is time that the universities in Asia re-examine more carefully and more courageously the relevance of the alien traditions that have molded their institutions. This not because they should at all cost develop a national or Asian image and tradition, but because the traditions they have taken over from elsewhere may not be relevant to particular needs and circumstances of their environment.

Research : Earlier, reference was made to the importance of research at academic institutions. This point needs some elaboration in the context of the relevance of universities in developing countries.

It has been argued, with considerable justification, that one of the foremost research tasks of universities is to make concrete contributions to the solution of the urgent development problems facing the nation. This concern for increased research emphasis

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5. BEARD, R. M., HEALEY, F. G. HOLLOWAY, R. J. — **Objectives in Higher Education.** London Society for Research into Higher Education Ltd., Dec. 1968, p. 26.

on significant social problems is not limited to the developing countries. A recent report on application of the social sciences in the United States of America, prepared by a group of outstanding academicians for the National Science Foundation, proposes the establishment of 'special social problem research institutes where social problems will be analyzed by teams of specialists from the social sciences and other sciences and professions.[6] While recognizing and acknowledging the importance of this aspect of the research function of universities, it may be well to stress a few other aspects.

Besides the needs and opportunity for research to contribute to social, economic and technological development of the nation, the conduct of investigations of various social and physical aspects of the society yields relevant knowledge for presentation in the course and seminars for university students. Especially in the basic and applied social sciences university lecturers of necessity rely far too much on data and examples drawn from the European and North American experience. Even while disregarding possible changes in coverage and emphasis, would not the teaching and learning of elementary economics, for instance, benefit greatly from illustrating concepts by using national or at least Asian examples and statistics rather than relying almost exclusively on the data contained in Samuelson's famous text book? But to arrive at that point requires research, research which can simultaneously produce indigenous data and case material and indicate the relative importance of certain building blocks of knowledge in terms of the environment in which the university graduates will function. Research, then, is an essential university activity for the development of an education system that is relevant to the Society.

Impressed with the urgency of solving concrete development problems, some observers of the academic scene in the non-Western world have frowned upon any tendency in the less affluent, developing countries to engage in basic research. It may be true that universities in few countries of Asia either have the resources, or are quite ready, or would serve the cause of national development most effectively, by encouraging the limited number of outstanding scientists available to focus on advanced theoretical research in nuclear physics, or econometrics. As a social scientist, however, and limiting myself to the field of knowledge, I have come to wonder whether in economics, political science, and sociology there are not reasons to do research on some of the concepts and theories we have accepted as basic knowledge in the West. Most of the theoretical. constructs that have been formulated in the Western social sciences are the results of observations made over time in a particular social, cultural, historical, and philosophical context. They are based on sets of assumptions regarding constants in the environment, about motivations,institutional

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6. NATIONAL SCIENCE FOUNDATION — **Knowledge into Action: Improving the Nation's Use of the Social Sciences.** Report of the Special Commission on the Social Sciences of the National Science Board, Washington D.C. U.S. Govt. Printing Office, 1969, p. 87.

structures and behavior, etc. The experience of applying the Western models of analysis and action to parts of the world with a vastly different socio-cultural fabric has shown the necessity of a considerable revision in basic assumptions and theortical under-pinnings in a number of instances. Toynbee has stated that "if a splinter is flaked off from one culture and is introduced into a foreign body social, this isolated splinter will tend to draw in after it, into the foreign body in which it has lodged, the other component elements of the social system in which this splinter is at home and from which it has been forcibly and unnaturally detached. The broken pattern tends to reconstitute itself in a foreign environment into which one of its components has once found its way". It is true that the elements of social struture and behavior are interdependent, that each element is part of a system or sub-system. There is no historical evidence, however, that there is only one or even an optimum set of social sub-systems to enhance the welfare of people in a society.

If the Asian nations base themselves entirely on the theories and techniques developed in other parts of the world, then there is no guarantee that these pill be relevant to the Asian environment. Apart from the likelihood referred to by Toynbee that the splinter of the other culture will necessitate often far reaching adaptations in other parts of the system, the very "foreignness" of the element of the system may result in its rejection or a traumatic period of maladjustment.

In short, there is ample reason to suspect that many of the current theories of the social sciences are "culture bound". Many of the findings regarding social and economic behaviour and institutions are based on non-Asian experiences and often peculiar to the time and place where they have been observed. If these contentions are correct, then there is reason to carry out basic research at Asian universities in the social sciences, as a minimum to verify the validity of Western concepts and theories in the Asian context.

Teaching materials: Related to the question of research is the urgent need to develop teaching materials based on and relevant to the Asian environment. With the exception of Japan, the instructional material in almost all Asian countries in most academic disciplines and professional fields is for ninety percent or more European and North American. This may make little difference in a field like mathematics, but certainly is disciplines like biology and economics, in professional fields like agriculture and public adminstration there is a need to develop materials that are based on and applicable to the respective Asian societies. In part this can be done by a mere adaptation of basic Western university textbooks. In part it may require a more fundamental revision of the basic concepts and materials used in teaching in the Asian region.

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7. TOYNBEE, ARNOLD — **Civilization on Trial & the World & the West,** New York, Meridian Book Inc., 1958, p. 283.

The adaptation or even the revision of teaching materials is not a popular undertaking among university scholars. Many who have received their advanced education in the West, or at least on the basis of western knowledge, identify with the international community of scholars and are more interested in making new contributions to existing knowledge than to adapt existing knowledge to the national and regional conditions. Only through more intensive contact among university staff members in the Asian region, by giving recognition to Asian scholars developing regionally or nationally relevant knowledge and teaching materials regardless of the impact this has or the respect it brings along among academicians at Yale, Cambridge and the Sorbonne, can academia in Asia achieve both the necessary independence and play a significant role in national development.

The foregoing comments should not be construed as an advocacy of rejecting institutions and knowledge developed in other parts of the world. There is little merit in deviating from the patterns of other countries merely to be different. Questioning accumulated knowledge exclusively on the grounds that it has been developed elsewhere would, of course, be a very unscientific attitude. But, it is equally unscientific to assume that accepted knowledge and the modes of disseminating and acquiring it can be transferred automatically, without careful scrutiny of its relevance to the new environment. What I am advocating is that the Asian universities explore more carefully than is frequently the case their structure, programs, activities, the contents of their courses and methods of instruction, their involvement in research and their relationship to other institutions in the environment, to develop university systems that are congruent with the environment in which they operate and contribute effectively to national development. This process of building relevant and self-reliant institutions will be facilitated by increased contact among the scholars and institutions of higher learning in Asia. Bodies like the Association of Southeast Asian Institutions of Higher Learning (ASAIHL), the Southeast Asian Ministers of Education Organization (SEAMEO) and the Regional Institute of Higher Education and Development can be extremely valuable in this regard. Once complemented with strong and respected Asian professional associations of university scholars in the respective fields it is likely that the standards of judgment of what constitutes eminence in institutions of higher learning will be assessed in the context of relevance to the respective Asian nations.

SCIENTIFIC AND INDUSTRIAL CHANGES IN S. E. ASIA AND THE ROLE OF UNIVERSITIES

by

K. C. Tai
Faculty of Engineering,
University of Malaya,
Malaysia.

The Problem of More, Not Less

Scientific changes that have recently taken place in the field of agricultural research — better wheat and rice grains — have sparked off what is soon become the green, green revolution. These new miracle grains could increase yield by several fold if costly investments are made in seeds, irrigation, fertilisers and insecticides. A farm revolution is therefore necessary to bring about a green revolution. In order to back up the modernisation of farming techniques, it is essential to initiate two supporting infrastructural innovations, an innovation in the field of finance and banking as well as the mental attitudes of the farmers and peasants.

The green revolution will alleviate the problem of hunger in S. E. Asia's growing population but at the same time, it will bring along problems associated not with scarcity but with plenty.

Large land holdings in order to be more efficient and more and more productive, will be mechanised and smaller farms consolidated. Thus the potential danger exists of many more millions becoming unemployed as the small farmers and peasants may be forced off the land, into the crowded cities. Nearly 60 — 70% of the people living in S. E. Asia depend upon agriculture for their livelihood. By 1985, their number is expected to increase by 50%.

Thus the green revolution, if it is not properly managed, may be the cause of a conflagration of violence. The farmers in their millions are not vocationally or culturally prepared for the rat-race of urban city life.

With this added pressure on the present unemployment trend, the position could only be remedied by the numerous creation of rural agricultural centres that would provide the "agro-industries" necessary to employ the peasants. Ware-houses, fertiliser plants, facilities to manufacture silon and other storage units, and work forces for loading and shipping.

In addition to the agro-industrial development such as back-yard and cottage industries as proposed in Malaysia, there is also the need for intensive agricultural diversification, which, in turn will also alleviate the unemployment pressure.

Consequently the green revolution as a result of recent scientific advancement indicates only a need for the re-allocation of useful labour potential but it also calls up the imagination of our national planners to look at the inter-relationship between intensive agricultural development and agricultural diversification with a balanced industrial development. Must industrial development be speeded on a massive concentrated scale in and near the urban centres, or must industrial development be more spread out to cater for the needs of growing problems from the rural areas?

Industrialisation

Taken as a whole for a given country, it appears that industrialisation will duly be accelerated if there is an increase in the effective size of the markets. In future. Singapore will give more emphasis on pioneer status for export-orientated industries, realising the smallness of its domestic market. Malaysia too will face this problem in a short time as import-substitution reaches an advanced degree of sophistication.

With the allocation of priorities to the correction of economic imbalances in Malaysia amongst the racial groups, one could see this as an added factor in speeding up industrialisation because the income patterns and proportion of buyers become wider in range and in numbers. This however implies a corresponding growth in Malaysia's economy which perhaps will continue to be liberal in its approach. On the other hand. the re-allocation of wealth to correct income-patterns on the basis of a fixed economy or a constant-pie basis will merely result in a transfer of wealth which in turn will not speed up industrialisation as it is mentioned above.

As production income increases with the have-nots, then good-education will become possible for more and more people. This is the crux of the problem. Malaysia as a developing country, like most other countries in S. E. Asia, would face its biggest challenge to stability in the field of human resources planning. The coming of the green revolution will force our national planners to emphasise more and more, on the proper role of vocational and technical training besides the re-training and re-education of our farmers and peasants in the rural areas.

Education and Industrialisation

With the new pattern of agricultural growth and the complementary evolving role of industrialisation, education and educational planning is expected to change with time.

Education must be geared to industrial and agricultural needs. Singapore has adopted the technical innovation to divert more students

to the technical stream. One out of every three secondary school graduates would possess technical skill. In addition, 6,000 of her students are reported to be abroad: 2,000 in U.K., 1,300 in Australia and others in New Zealand, Canada, the U. S. and Japan. Private students were reported to cost Singapore $30 million annually in foreign exchange.

With the lack of natural resources and land space, Singapore's strategy to increase her material wealth and the improvements in her living standards must depend on higher standards of technical skills applied to manufacturing industries and for more complex and sophisticated products. Both the University of Singapore and the Polytechnic are accelerating the intake of students for the scientific and technical stream.

The Solution

In an article "Agriculture in Asia," Colin Clark pointed out that, economic planners, whether Maoist or Keynesian, are still thinking of the agricultural labour force in man-year units, and still planning with the idea how many of them could be transferred to other employments. Instead of this method, Colin Clark advocated that economists should be trained to think in man-months rather than man-year units because of the climatic and seasonal changes in the region and its effects on agriculture.

In addition to this new approach, there is no doubt that the coming of the green revolution will then accelerate the need for industrialisation and modernisation. With the green revolution in progress, more and more labour is freed for alternative industrial employment. Hence both the spiralling population growth in S. E. Asia and the increasing surplus of potential labour available as the result of the green revolution, must be given an alternative employment outlet. For farm labour which may be displaced from smaller, uneconomic farms, there is the necessity for increasing adult education and retraining. This would enable displaced farm-workers to take jobs in new industries which are situated close to their villages. Numerous such agro-industries would ensure a high degree of flexibility in the utilisation of labour.

The Asian Communist Parties which are linked closely to Peking are appearing to think along the same lines mentioned above. A dramatic and fundamentally important shift in emphasis has taken place from the cities and out to the countryside or rural areas.

In view of the current political situation in S. E. Asia, and the vulnerability of the poor farmers, the aim should be to bring the benefits of science and technology to the countryside. This would encourage the rural people to approach their problems scientifically rather than being manipulated through superstition and ignorance. In addition, by making them more self-reliant, they are less liable to follow the first demagogue who comes along.

Current Myths

Economic growth and industrial growth is not always based primarily on cheap labour. Many parts of Asia have lower labour costs as well as more raw materials and yet have not achieved significant economic development. In addition, possession of the world's oldest civilisations and cultures is not a short-cut either, to economic development.

The paradox of the S. E. Asia situation, as elsewhere in the poor regions of the world, is that youngsters are trained in skills which are not wanted. But, at the same time, they are instilled with values which will make them unwilling to accept the jobs that are available.

The Back-Ground

Most of S. E. Asia has a long way to go towards economic development. The countries in the region face anguishing challenges. They have to solve numerous and complex problems in a short time, which elsewhere, took a longer period to accomplish. Problems outpace capabilities and the temptation is to aggravate the prevailing situation with extra margin of power.

The S. E. Asian regional development must not only be seen merely as a structure or a process but it is also a drama of human beings.

The prospect of the region having a high percentage of the world's population, still increasing at the rate of 2-1/2% per annum, is to say the least, still alarming. To add to the crisis, the industrialised, developed countries are becoming increasingly self-sufficient in both industrialised raw materials and agricultural products. Natural products are increasingly being replaced by synthetics. The trade gap is expected to widen further, with time, from a recent survey made by UNCTAD.

Nearly all the countries in S. E. Asia approach their industrialisation by the adoption of existing technologies.

The Perspective

Phenomenal population growth has in the meantime threatened the measured but realistic economic progress that has taken place. Malaysia has registered impressive gains in agricultural and manufacturing production. From 1960 to 1968, manufacturing production had increased at about twice the rate of growth of the domestic products (at about 9% in manufacturing), yet it has been found necessary that Malaysia would have to achieve more than 7% growth rate to create job opportunities for the unemployed and under-employed. The post-war population has increased by at least 60%. The present employment problem is, how to give useful employment to those seeking work, — especially the school leavers.

By present estimates and standards, Malaysia could reach a condition of over-population within the next thirty years, if the fertility rate is not decreased. At present, however, Malaysia is not over-populated : the soil is generally fertile and there is as much new land available for settlement and cultivation as the total area now under cultivation.

The long-term strategies to create a greater community of one people has still to continue. Primordial demands which are likely to emphasise on the parochial, religious, linguistic and ethnic identifications are still paramount to most of the citizenry.

Growing Anguish

In its latest report, the UN. says that the end of the world's "population spiral" is not yet in sight. There will be even more babies born per hundred people from now until the middle of the 1970s.

The development of new types of grain and rice, and the fertilisers to stimulate their growth, has made the feeding of the expanding population in S. E. Asia theoretically possible.

The food will be there, but with a population growth of 2.5.to 3% per year in these developing countries, there will not be enough jobs to go round.

Without jobs, the vast majority of the population will not be able to pay for the food that is available.

Trade development cannot keep pace with the inflation of prices in the industrial countries, the rich lands will get richer. These are the summaries of the Second World Food Congress held in the Hague recently.

The growing unfavourable trade imbalance will result in increasing difficulties in securing enough world money for development. ECAFE reports from "Long-Term Planning Proposals" that exports will grow more slowly than imports. The agricultural products which have to furnish the greater part of these countries' export income are subject to threats of substitution and synthetics. Defence budgets and internal security problems are increasing their claims on export earnings. The implications on current stability and inflation are obvious.

The green revolution may lead to a farming revolution provided there is a banking and finance revolution, to back it up.

Industrialisation may not rise fast enough due to smallness of the markets: the income-patterns and proportion of buyers are important, not the number of people.

Growing population pressure is likely to reduce domestic saving and increase consumption.

Meanwhile, unequal division of income is becoming more obvious, unemployment is growing and opportunities are not increasing as fast as education turns out bright young men and women. People have come to export more, not less.

The Role of Universities

In the context of what has been described above the role of universities in the S. E. Asian region is the most challenging one. Besides learning, teaching, research and administration, the social outlook of the universities should be developed so that the university in whatever place it is situated, should serve all sections of the community and not be the instrument of any one section.

Every country in the region has certain elements of threat to stability and the process of being attracted to the radical posture of the young, is not due so much to economic decline but also more, to economic growth. The education process has turned out many more bright young men and women who expect more and the consequence of economic growth is to spur this aspiration of the intelligent and educated.

On the other hand, 80% or more of the other younger people in the same age group in many of these countries in S. E. Asia are in the lowest income group. Although top priority may be given to them, their common feeling is that despite economic growth, the country's prosperity has not been able to re-dress their economic and educational disadvantages. The greatest incidence of unemployment is between 15 to 24 years of age.

What should be the role of universities in this direction in addition to their other existing priorities of learning and research and high-level man-power training? Could we enlarge the understanding of ourselves, man and nature, to help solve the pressing problem ahead of us?

UNIVERSITY STUDIES APPLIED TO THE NATION'S RENEWABLE RESOURCES

by

W. R. Stanton,
School of Biological Sciences,
University of Malaya,
Malaysia.

Development of the subject 'University Studies Applied to the Nation's Renewable Resources' on which I am asked to speak implies acceptance of a number of assumptions which may not be true.

The main assumption is that, in spite of the University being at the summit of the educational pyramid, it is nevertheless a geographically, sociologically and politically orientated establishment. Further, it assumes that "the production of students forms part of a national plan to meet a manpower requirement, or to generate feed-back so that the output of students itself creates the demand for trained manpower". This may seem an obvious objective, but I think it needs restating in view of the all too prevalent political objective of creating a certain proportion of the educatable population with a "degree" irrespective of the quality or content of that degree, or of the economic potential for employing a given output of graduates.

The second assumption is that "if the community is prepared, as part of the economic plan, to demand production and accept the output of a certain number of technically trained students, it follows that it must also be prepared to accept a certain cost of production per student". This contrasts with the concept of "cost of production of a graduate", since the unit cost of the latter can be gradually reduced until the value of the end product is virtually worthless.

A third assumption derives from the use of the "studies" in the title. No institution teaching science at the highest levels can justify its existence without close association with research work and the active participation of the teachers in such research.[1] This implies additional expenditure, or further involvement with the economy by the University. It is one of the most difficult aspects of development which has to be mastered by the administration of a university if on the one hand the University is to acquire adequate funds for this expensive exercise and, on the other hand, it is to retain its academic freedom and independence as a counselling body to the community.

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1. SYMONS, C. R. — "Teaching & Scientific Research", in **Nature,** 223 (5204) London, 1969, pp. 353 — 354.

To summarise, therefore we may pose the question, "How does a university apply its studies to the development of national renewable resources without prostituting itself to the body politic, or the body economic ?" Having posed this question, I now propose to set it aside whilst we consider two other variables in the context of the University activities in relation to the technical evolution of a country. These both affect the academic life of the University and are divided by the Senate into those which are concerned with action downward, that is, towards the students and their courses and secondly action upwards, that is, the relation of the academic staff of the University towards the outside world.

The Students and their Courses

Even if the university masters the difficult exercise in diplomacy and accounting posed by the previous questions, there are others concerned with the internal organisation of science and technology in the university which remain to be considered. These are :

How far are the students to be technologically trained, as distinct from basically scientifically educated ?

To what point in time is their training to be aimed ? Is it to be five, ten, or fifty years from the present ?

How much is the training of these students to be dictated by current political thought on the optimum path for the nation's economic development ?

How much are student numbers to be dictated by the postulated economic structure envisaged by the extrapolation of this pathway ?

I have suggested that the teaching activity must be integrated with a body of research activity, if the teaching is to be live and to be given with conviction and a goal in view. Can this body of research be generated with predominantly locally orientated research projects without presenting to the students a distorted picture of the developing world of science ?

The University as a leader or counsellor in Natural Resource Development

If the previous assumptions are accepted we are still faced with the question of how far the University should attempt to guide the policy on development in the government and private sectors whilst remaining outside the political scene ? The position is made more complex in Malaya, for example, by the recent development of new universities whose aims and objectives may not be the same as those of the standard multi-discipline higher educational body. These differences are not just those which are due to regional or geographical differences. They are due to differences in aim, and present many

difficulties in discussion with a common voice between the universities and Government. Regional universities can combine their technical objectives in a comparatively simple manner — and probably the most suitable level for this is at the faculty level — to present different aspects of science, or regional differences in emphasis, to the community without wasteful reduplication of equipment or staff.

At this stage may I conclude my general premises by considering the types of research into the natural resources of a country which are suitable provinces for the university in which to conduct teaching, and the types of research which are to be avoided.

In a developed economy, there is in both the government and private sectors a considerable body of research, account of which has to be taken in the planning of research in the university. It will be found that most of the fields in which short-term results, or easy solutions, are likely to be obtained are already the subject of considerable research in one or other of these two sectors, that is Government and Industry. This leaves the University with several difficult decisions.

Does the University attempt to repeat research which is being conducted in the exploitation of Natural Resources outside its walls ?

Does the University attach itself to the major fields of research being conducted by the other sectors by embarking on a small fraction of that research, possibly divorced from the main body of research which is being conducted in the specialist institutions ?

Or, does the University take a gamble and attempt those items of research in which the risks are too great for a business concern (by virtue of conservativeness of its research direction) ?

The character of the research in science, especially into natural products, has been changing rapidly in the last 20 years to one in which the capital involved may be very large. The team concept prevails. University research has therefore to be small, in terms of capital expenditure, partially isolated and I suggest there is a danger of it being amateurish — though this need not be so.

Or it has to weld itself into teams within its walls and, by co-operation, outside. Academic staff in the University tend to look on the research teams of special institutions as having all the advantages. This is a view with which I would disagree, having worked on both sides of the fence. Original inventiveness is a rare phenomenon the climate for which can be created by the small group.[2]

Large universities, not only in the United States but elsewhere, have academic graduate staff running into hundreds, possessing a diversity

2. SAWERS, D. — "The Sources of Invention" in **Progress** 54 (303) 1970, pp. 16 — 20.

of skills and acquaintance with fields of knowledge much greater than is to be found in all but the largest research institutions. It is the recognition of this diversity which is the key to the decision making in the pattern of University research. The freedom available in the University on the choice of research is also a feature of the University system which requires exploiting to the full in the decision making. Industry recognised this and there are encouraging signs of this recognition by industry in Malaya.

The remaining principle in making research planning decisions is to fulfill the obligation to the academic principle that "research conducted within the University should have a high philosophical content". We must recognise that much research in government and in the private sector is not really research at all but only development — testing and product control work much of which is frequently mislabelled "research".

The really difficult point comes in establishing the connections for the traffic of ideas, effort and skills between the University groups and those of Government or the Private sector. In collaboration with the government, some of the rigidity of operation of a civil service is liable to rub off on to the University research effort. There may be a mutual lack of understanding by the government and the University groups of each other when it comes to the mode of operation, the ability to obtain material, the freedom to use equipment and obtain other services, and the ability to deploy funds on additional staff. Sadly, as the University gets larger, it seems to approach in its administrative organisation closer and closer to the civil service concept — without actually ever admitting it — rather than the University having any liberalising effect on the civil service itself.

This idea of convergent evolution of management, with the bias always in the direction of the "establishment" attitude is a phenomenon also found in the major industries.

In collaboration with the government, at some stages in the research the question is asked "who is to benefit financially from the results of this collaboration ?" Because of its rules and regulations, the government is in a more difficult position in that it acquires the cloak of responsibility to the electorate (often spurious) and demands all the benefits of inventions. This need not happen, but it is one of the important reasons why senior administrators are required in universities. That is, people, who have wide experience of the operation of a spectrum of administrations and know how to enjoy the benefits of patronage whilst avoiding the embraces of the patron. It must be remembered that governments have, up their sleeves, regulations which can prove an embarassment to the free utilisation of the results of research; or may inhibit the free interchange of ideas which have arisen from the collaboration of the University with the government in the form of acts known as the Official Secret Acts, Defence of the Realm Acts, or some similar terms.

This may suggest that it is better for the university research workers to embrace the arms of industry. The pitfalls are just as bad. Industry not only has its own need for security arrangements, backed up by civil law, which the university worker coming into contact with industry must respect, but it also has the need to make a profit and it is liable to make decisions much more sharply than the government sector. Thus, one may find that in industry a research or development project — which may have been going for several years and may have had an expenditure running into millions of U.S. dollars — is halted without warning by virtue of a Directors' meeting. If may thus throw the annexed University research programme completely out of balance and upset the aspirations of the University co-operators.

I have emphasised the general principles on which a University might operate its studies in relation to natural product development. The case study aspect must be rather brief not only because of lack of time but because, if I become personal about the situation in Malaya, I may find myself upsetting by my remarks the delicate balance in the local negotations in Natural Product Development Research between the University, Government and the Private sector.

In the published version of this paper, I set out briefly the Recurrent Natural Resource Output of Malaya in relation to the Gross National Product of the Country. In Malaya, like in many developing countries, the natural product output forms a large portion of the Gross National Product.[3] Malaya contrasts in many other ways with many developing countries not only in the high per capita income, but also in the favourable land to population ratio and the abundance and regular flow of her renewable resources. As may have been heard elsewhere in these papers, one of the important natural resources may not be strictly renewable. I refer in particular to the timber and forest products resource. Here, the University has been at variance with some other counselling bodies in asking for caution and respect in relationship to the utilisation of this major resource. The University has also been forward in stressing to the community at large that the exploitation of one natural resource should not endanger or be excessive at the expense of another.

There is an unfortunate paradox in the case of two natural resources in that tin mining, which is a non-recurrent natural resource has been in the past, from a purely business point of view, a more profitable undertaking than utilisation of the tin-bearing land for annual or perennial renewable resources. This is partly due to a fault in the estimation of the value of a natural resource in that it has relied too much on the hardware and not enough on the social benefit to the community of alternative forms of exploitation. Here the University has been able to put forward its views and conduct research on a variety of aspects of the results of tin-mining activity.

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3. MALAYSIAN GOVT. — **Mid. Term Review of the First Malaysia Plan,** Govt. Printers, Kuala Lumpur, 1969, p. 135.

In my own field, applied botany, the University of Malaya has a very important role to play. Although natural products form a large part of the gross national production, they are relatively limited in number and their individual economic potential is changing. The University can, by virtue of its long-term research and its diversity of interests, act as a counsellor in suggesting the direction to be taken in the utilisation of new natural resources. For instance, Malaysia is the home of wild relatives of a number of economic plants used as fruits, staple foods, or for the extraction of special biologically active chemicals. These may be of pharmaceutical, insecticidal value, or accessory materials in the food industry enhancing flavour, improving texture and stability, improving colour or the physical properties of the main constituents.

We have also been forceful in putting forward the view that the present natural resource exploitation is not as efficient as it might be and we have stressed the need to encourage the better utilisation of the bio-mass whether it is from forestry, agriculture, or animal production. From our plant and animal studies on local species we are also able to suggest ways of improving the pattern of growth and development. These are relatively novel ways of looking at the utilisation of natural resources and have strong social implications in that the demand changed attitudes towards various natural products and their derivatives. Here, the University is able to help by combining the activity of the historian, the sociologist and the economist with those of the scientists and technologists in putting forward suggestions which will be economically and socially as well as technically acceptable. Again, quoting from my own field of study, communities in Malaya have rigid views on what they regard as acceptable food materials and their preferred materials for other domestic uses. Only by a careful comparison of the social benefits with the technical benefits to be derived from changing to new products such as vegetable protein, single-cell protein, extracted fish protein and changing the forms of carbohydrate and fat utilised by the community, may one expect to achieve real progress in mass acceptance and thus an alteration in the economy towards faster development.

As you have heard elsewhere in this symposium there is a reasonable respect for the views expressed by the University and the activities of the University in relation to other sectors of the community. I can only hope that this university will be cited as a model of the relationship of the technology of the University to that of the Community which others may follow.

If I may summarise my statements, by saying that, if the principles I have put forward are not accepted by a University, then it has the following choices :

a) To cease to be an independent body and allow itself to come under the civil service directly
b) Retreat into an ivory tower of science
c) Drastically reduce the science content of the University.

The correct solution is in my view the one in which there is a good awareness of the strings attached to the financing of the University and a counteraction by the University by balancing one source of funds against another; by the University generating its own source of revenue and acquiring a high percentage of its capital from politically unaligned sources.

If it strives for these aims, it can achieve its proper aim as a co-operator and counsellor in the field of natural product research, and it may become a property-earning or patent holding body. If the involvement in the study of natural resources helps to achieve these aims — and in Malaysia it seems possible — then involvement with Government and Industries is a highly laudable exercise.

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ACADEMIC FREEDOM AND THE CHANGING RELATIONSHIPS BETWEEN UNIVERSITIES AND GOVERNMENT

by

D. E. Varley,
Association of University Teachers,
University of Nottingham,
England.

In this paper, I propose to look at two related matters: one, participation of teachers in university internal government; and, two, university autonomy and the relationship between universities and their paymasters. As these are broad and well discussed topics, I should like to concentrate upon a single, novel aspect, namely, the role of the new, professionally-staff associations of university teachers and to focus largely upon one part of that role, namely, their pursuit of economic objectives. The establishment in April of this year of the first ever formal system of national machinery for collective bargaining in Britain has highlighted for us the potential significance of national and local collective bargaining upon the delicate balance between academics and administrators and between institutions and government. As this balance is much affected also by the rate of expansion of university education, I shall try to single out some growth problems for brief examination *en passant*.

In Britain, as throughout the world, university education has expanded and is expanding rapidly. The rate of expenditure by central government rose tenfold in the past thirty years. In the 1960s alone, student numbers doubled and are expected by 1981 to double again, bringing the total to well over 400,000*1*.

University staffs have grown roughly in proportion; membership of the Association of University Teachers doubled during the last decade to approaching 20,000 and in the process, A.U.T. has become increasingly professional and influential.

The A.U.T. forecasts that "without in any way diminishing their standard of entry, the universities could have half a million students by the beginning of the nineteen eighties." **"Universities in the 1970's:** A Working Party Report." para. 8.

1. In regard to availability of places the Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom refers to estimates so far made by universities in Great Britain which in aggregate amount to "a total figure approaching 400,000 full-time student places by 1981 – 2." **"University Development in the 1970s"** April, 1970, p. 9.

In a number of other 'western' countries powerful associations also thrive, notably in America, Canada and Australia. Why have they arisen, and what effect are they having? Are they benign defenders of academic prerogatives; or are they malignant? These are important issues, for such power groups draw their resources from within academics yet are responsible only to themselves. Professionally staffed, they are relatively new to the university world and their authority (within the law) is limited only by finance, the degree of sanction they are accorded by their members, the competence of their leaders and by the strength of countervailing and mainly institutional forces.

On the evidence of Professors Walter Metzger and Harold Perkin — historians respectively of the American Association of University Professors and the United Kingdom Association of University Teachers — generalist associations are contrivances of situational necessity and historical coincidence. For, on the one hand learned societies cater for the special interest of scholars within a discipline. On the other, democratically self-governing institutions may regulate the affairs of multi-disciplinary communities in a manner which maximises the freedom of individual member within constraints imposed by pedagogic, ethnical, economic and other social desiderata. Given the effective operation of the former and the substance (rather than the chartered shadow) of the latter there appears to be little for an association of university teachers to do.

Their revealed aims compel one to the tentative conclusion that they exist largely for two reasons: because university institutions infrequently exhibit the behaviours of a self-governing democracy and secondly, because social institutions both governmental and non-governmental, whilst oft proclaiming the validity of the concept of university autonomy, have consistently and in practice denied it.

The logic of the first situation might be for an A.U.T. to concentrate its efforts upon the development of university self-government with an ultimate view to discharging upon a confederation of (democratically governed) university institutions such responsibilities for the defence of academic feedom (including security of tenure) and professional standards as it might have assumed. Co-laterally, it would transitionally take an active interest in salary (or "economic compensation") matters if only for the lofty purpose enunciated by T.H. Green, of gaining access to a meaningful state of creative freedom by first escaping the rigours of poverty[2].

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2. WALTER P. METZGER — writing in "Dimensions of Academic Freedom," University of Illinois Press 1969, says that in 1915, in fact, the debutant American Association embarked upon the pursuit of "three professional requirements — quality, authority, security, each of which implied a different organisational objective — self-improvement, self-government, self-defence." If the second and third of these could be attained, the first could then be promoted within the framework of university institutions and the A.A.U.P. would presumably dissolve itself.

The reality is that many universities have expanded and have outgrown the possibility of meaningful, teaching body responsibility[3]. To cite just one case, the University of Paris, prior to this year's division into more than a dozen assorted packages, was attracting almost one third of France's 600,000 students. One faculty alone, that of Law and Economics, had 38,000 students.

If administrators of 'mega-varsities' are powerful they must of necessity also seem remote. Assemblies numbering thousands cannot possibly afford a satisfying level of individual teacher personal participation. Effective democratic government in large institutions is illusory and recourse to representative mechanisms is no panacea. Yet the demands of British and American societies for university expansion with maximum economy have created and continue to create gigantic, corporation-institutions. If they are administered efficiently they become too tyrannical for most teacher-scholars; if they spurn authoritarian management they tend to lose pace and direction and to forfeit economies of scale. The dilemma is inescapable.

Concurrently and of graver import, universities themselves are surrendering to others the authority which is the very substance of this dilemma. As Walter Metzger writes, the university government have been "delocalized." Brilliantly he portrays the modern university engulfed by a city and inextricably caught in its legal, political and social framework; university research functions, influenced by government sponsors;[4] and the emergence of "bureaucratized philanthropy as a principal source of academic innovation."

At home, some anxiety has recently been expressed about the influence of "big business" but the main, continuing concern focusses upon the relationship between the public, central government and the academic community. I do not wish to dilate at length upon this very complex problem. Suffice it to itemise one or two explanations of this malaise before proceeding to a more detailed study of the impact of collective bargaining at local and national level. As a general rule, a dependent institution whose chief object is to make known the unknown and to subject to continual public re-examination every accepted precept and concept cannot hope entirely to avoid offending the most disinterested of patrons. That alone would be sufficient to introduce tension into the relationship between donor and recipient. Other understandable provocations occur: for example, is it realistic to expect the British public to accept uncritically the premise that expenditure on university research should be a simple

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3. Only seven years ago the A.U.T. was suggesting a general upper limit of 4,500 students. Today, 10,000 seems to a majority to be tolerable if not indeed desirable on grounds of economy.

4. Docksey Committee Report — Federal support for U.S. college and university scientific research was $2,262 million in 1969. Para 8.25 Pub. by Confederation of British Industry, July 1970.

function of the number of undergraduates admitted [5] or that the number of young people to profit from university education should be decided by taking roughly 55% of those passing two or more subjects ("Advanced" level) in the tests controlled by universities themselves (through their examination syndicates and boards). British universities are themselves inconsistent. If we were challenged to gather statistics showing variations in staff-student ratios by university, by size of department and by subject discipline I am certain that we should be totally unable to give plausible explanations to those who are anxious for demonstrable economy in the deployment of scarce academic resources. A further and glaring inconsistency which has only recently begun to be remedied [6] is that on the one hand, university education departments give one-year courses of compulsory professional training for school teachers while on the other, universities provide only pitifully short (2-3 week) courses for those of their teaching staffs who volunteer. We have university Appointments' Boards (which help place graduates in employment) yet so many academics look upon any form of vocational orientation — other than for the university profession — with open contempt.

For these and a variety of other reasons, the British public (parents, potential and past students, tax-payers and employers) seem almost to have been invited to demand government action.

As Dr. W. K. Chagula enunciates, "the purpose of a university is to educate men and women who will promote the development of society to the highest attainable level, to train men and women for certain professions, as well as to pursue learning and research without regard to immediate utility."[7] University autonomy will thus be in peril whenever academics neglect the nostrum of Dr. Cyril James that autonomy is relative, not absolute. They should remember that it is best guaranteed when public opinion is convinced that within certain broad constraints, universities can best serve the public interest if given freedom to make their own decisions. Thus, universities exchange the contributions they make incidentally or advisedly to the public's goals for the right and the resources to pursue academic goals of their own choosing. It is the 'exchange rate' (if you will forgive an economic analogy), rather than the principle which varies from country to country and from decade to decode. Constitutional arrangement (such as the U.G.C. 'buffer') do not and cannot establish this 'rate'; they, rather, guarantee the going 'rate' and cushion it from short-run fluctuations.

Dr. W. K. Chagula, President of the East African Academy, makes it clear that universities will pay a relatively high price: "The

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5. Given the constraints that all university teachers must both teach and research dividing their time in roughly equal proportions between the two and that the staff-student ratio is constant at 8: 1, the amount of research undertaken will depend upon the number of students admitted.
6. Largely through pressure by the A.U.T. and the Society for Research in Higher Education.
7. "Academic Freedom and University Autonomy in the Economic, Social and Political Context of East Africa." Minerva. Spring 1968, p. 416.

purpose of a university is to educate men and women who will promote the development of society to the highest attainable level, to train men and women for certain professions, as well as to pursue learning and research without regard to immediate utility. This definition of the function of a university should be acceptable to East Africa provided that the meaning of the words 'the development of society to the highest attainable level" is acceptable to the people and governments of Uganda, Kenya and Tanzania and provided that a responsible body which commands the confidence of the government of the country concerned determines the professions for which the university will train personnel, as well as the balance between research projects the results of which have no immediate utility and those which are designed to assist in solving the immediate problems facing Uganda, Kenya and Tanzania. loc. cit. By contrast Professor Metzger reveals that American professors used to believe that no forfeit at all was called for provided that they were neutral and competent. Reponsibility to the public was necessary but "the public" meant neither political representatives nor contemporary opinion. "The public ..... to whom the professors were responsible was an abstraction called "posterity".[8]

The most tempting way for the British government to respond to public pressure is through the administration of parliamentary grants to universities through the U.G.C. and the Research Councils. For almost three-quarters of current university income now comes quinquennially from a Parliamentary provision which is administered by the Committee. The 'block grant' system by which local universities retain formal discretion in the spending of the monies allocated them is increasingly subject to particularised statements of 'guidance'[9] by the U.G.C. which is itself under some government pressure with the emergence of indicative planning of higher education by the Department of Education and Science.

About nine-tenths of Universities' capital expenditure comes from the Exchequer via the U.G.C. which earmarks the larger appropriations and controls in detail many aspects of building specifications, phasing of starts at alia. A curious but significant aspect of expansion is that because capital grants feature so much, the degree of U.G.C. participation in university sector decisions can be much greater than it is during non-expansionary phases. Complementarily, because univer-

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8. 'Academic Freedom, in the Age of the University.' Columbia University Press, 1955, p. 136.

9. U.G.C. Annual Survey, 1968 — 9. Cmnd. 4261, p. 39, contains the following: "The freedom of discretion afforded to universities by the block grant principle is qualified in practice by convention. Universities accept that it is the U.G.C.'s business to set the general strategy and that, while they are free to plan their own development in the light of their particular circumstances, they have a responsibility for exercising this freedom within the framework of national needs and priorities, and in the light of the guidance, general or particular, given to them by the U.G.C. This is a well-established convention and it is an essential part of the "U.G.C. system." It was summed up in the Memorandum of General Guidance which the U.G.C. issued with the 1967 — 72 recurrent grants:

sities are notoriously unwilling to discard or contract existing departments to make way for new schemes, reform and innovation tend to take place by accretion rather than by substitution of resources. Thus the U.G.C. tends to have thrust before it new departures involving additional recurrent grant and therefore, to be drawn into "guiding" on the very aspects of university activity — namely experiment — for which autonomy is generally and most zealously sought by scholars *10*. I conclude, as a broad generalisation, that the 'price' demanded for university autonomy in Britain is rising for two basic reasons: the scale of university education and the pace of expansion.

I turn now to the specific question of the role professional associations are taking in salary negotiations. Two sharply contrasting views are displayed by the A.A.U.P. and the A.U.T. respectively on the subject of 'unionisation' and its effect on university internal government. The British association emphasises salary levels and the American, until quite recent times at least, security of tenure. The one now favours direct, national collective bargaining and national scales," the other reluctantly and in exceptional cases only, enters local collective bargaining and does not contemplate national bargaining at all; personal salaries are preferred to fixed sccales. The British association exerts pressure as directly as it can upon paymaster and employer; the American exerts economy-wide pressure by indirect means.

Most American universities do not promulgate salary scales; teachers' salaries are personal. Grading into full, associate and assistant professor, lecturer and instructor is almost universal. Typically, the "faculty" negotiates an annual global sum with the governing board; deans of schools compete for this sum and within schools, departments and individuals negotiate personal salaries. Actual remuneration varies from institution to institution and, within any one university, from discipline to discipline. In 1966-9 for example, the average "compensation" — that is, salary plus fringe benefits — of full professors was $27,000 in the most generous universities and $8,000 in the least generous. For assistant professors, the extreme were $12,000 and $6,600.

A.A.U.P. does not represent individuals in salary matters. Indeed, if it were to do so, a whole army of negotiators would have to be employed for a very limited period each year. The economics of salary negotiation, as the A.U.T. discovered, encourage the adoption of fixed scales while the principle of parity of esteem lends respectively to national uniformity. In this respect Britain and the U.S.A. differ markedly. It is not surprising therefore, that the American Association, though from the outset much concerned with salaries, used to be perplexed by the heterogeneity of remuneration levels and modes of

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10. A similar argument can be advanced in relation to the allocation of funds by the Science Research Council and analagous Councils.
11. At present national scales apply for lecturers only — senior grades have salary "range" though most universities now have their own scales for senior lecturers and readers though not for professors.

salary determination. It appeared inescapable that they could not introduce a meaningful policy and collective voice without at the same time insisting upon an unpalatable degree of uniformity. So long as members preferred personal salaries and had reservations about collective bargaining, there seemed to be little that the Association could do.

A major break-through came ten years ago when Professor Fritz Machlup brilliantly revivified Committee 'Z', A.A.U.P.'s Economics Status committee, and "evolved a salary-rating scheme that improved the comparability of remunerations, held all institutions to a single standard and measured performance by familiar grades."

How the committee came to have an impression influence requires explanation. Each year the Association requests some 1,350 institutions to supply data. Tabulations are made from the returns, the most important of which classifies average and minimum salaries by academic rank into seven grades: AA, A, B...F. An appendix lists the grading of individual institutions and gives the number of teachers in each academic rank. An interested enquirer can thus identify the universities which pay most and least and those in which the promotion prospects appear to be most and least favourable. The keenest readers of this appendix are said to be college presidents and board chairman. In 1959 Committee 'Z' also challenged universities to double their salary levels over a period of a decade and each year the Association's report singles out those whose decennial record of progress is good and those who are falling behind.

Each year "projected standard scales"*12* defining in dollar terms the grades AA to F are published. They relate to total compensation and set out both average and minima for the main academic rank. Thus, any institution desiring to maintain or improve its current rating may know in advance what it must do.

Machlup's plan triggers off, stimulates and amplifies what are essentially competition-generated rises in pay. It establishes a long-term target — a doubling each decade — addressed to universities individually and yet effectively a challenge to the whole system. It supplies short run targets through its annual projections of changes in salary "scales." And it continually offers for inspection the progress record of individual institutions thus enabling them and their faculties severally to compare aspirations with audit, and plan with performance. University autonomy is not imperilled; on the contrary, the responsibility of the individual governing board and faculty is emphasised. If a particular institution does not like the adverse publicity which a poor performance high-lighted in the Association's annual report implies,

12. "I find the use of the word "scale" confusing because scales in the sense we employ the term in Britain exist in very few American Universities. Scale in this context means a series of figures each of which defines the lower limit of a grade. Thus if grade B for a particular rank of professor is $12,000, C is $10,000, institutions which pay that rank between 10 and 12 thousand dollars will be graded C.

the remedy is in its own hands. In Walter Metzger's words, "Committee 'Z' now exposes through self enquiry and capitalizes on the power of invidiousness by naming and rating institutions"[13].

Given that each is at least moderately ambitious, that funds are not impossible to obtain from legislators or from benefactors, and on the further assumptions that the short terms supply of unversity teachers is limited and that incumbents respond to bids by institutions, A.A.U.P.'s salary survey is informational fuel to stoke the fires of competition for staff within higher education. Whether causally connected or not, the introduction of the annual survey ten years ago has been accompanied by spectacular increases in remuneration levels. Between 1959-60 and 1967-68 annual rates of increase in compensation fluctuated between five and seven and a half per cent. Allowing for inflation of 1.5% per annum, real income increased by two fifths in seven years.[14] In the period of 1964-69, the real [15] salaries of British university teachers fell by 10% according to Professor Dennis Swann [16]. It is tempting to infer that the remarkable contrast in performance is not unconnected with the fact that throughout this period national scales were determined unilaterally by the government in the light of its prices and incomes policy.

Within the past couple of years, inflation in the U.S.A. has emerged in serious proportions. Moreover, university teachers have become more conscious than they been for a decade of the rate of increase in the pay of other professions. Committee 'Z' was instructed by the annual meeting in 1969 to add to its annual survey, data concerning movements in the cost of living and movements in non-university professional remuneration. Increasingly, therefore, the salaries and grading researches of the A.A.U.P. and A.U.T. resemble each other though the machinery into which their respective findings are fed is unlike.

This latter is, largely because as we have seen, the situations in the two countries are far from analogous and secondly, because the attitude of the A.A.U.P. towards collective bargaining differs from that of the A.U.T. For, to the majority of their members, it is improper for the A.A.U.P. to be active in the market place and, because participation of local faculty in their own institutions is so effective, the introduction of an external bargaining agent undermines faculty responsibility and is, in any case, unnecessary. Currently, a keen debate is taking place within the Association and the outcome of it may prove to be critical because, in a large number of States, teachers are being

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13. METZGER, W. P — "Origins of the Association" **A.A.U.P. Bulletin,** Summer 1965, p. 237.
14. BAUMOL, W. J. & HEIM, P. — "On the Financial Prospects for Higher Education. The Annual Report on the Economic Status of the Profession, 1967 — 8." **A.A.U.P. Bulletin,** Summer 1968, p. 189.
15. METZGER, op. cit.
16. Professor of Economics at the University of Loughborough and Convenor of A.U.T.'s Salaries and Grading Committee.

asked to elect a statutory bargaining agent. If the Association declines to enter the contest — normally a local "chapter" or a regional conference of chapters, will be entered rather than the national body — or fails to secure election, it will not only be excluded from certain rights by statute but may also lose membership to rival associations.*71*

If it does enter and is successful, many of its present members will resign in protest at "unionisation." a reaction not unknown to local associations of the A.U.T.

Whatever the decision, it will emerge from a conscious identification of the issues and explicit adoption of new policies. By contrast the A.U.T. appears to have drifted into an increasingly union role without ever formally scrutinising the consequences such fundamental change entrains." As a consequence, we in Britain are now well into a serious predicament of which we are scarcely aware.

One form of it is stated by Dr. Harry A. Marmion, "The historic role of the A.A.U.P., as a professional organisation, was one that views the institution as a 'community of scholars' in which all faculty members participate in decision-making in a democratic fashion. Sharing of responsibility is advocated as an alternative to the adversary relationship that would prevail if the faculty segment of the academic community resorted to unionism."*18*

To this, A.A.U.P.'s General Secretary, Dr. Bertram Davis has added, "Faculty members have rightfully complained when boards or administrators have treated them as employees, and it would be ironic if they were now themselves to perpetuate the employer-employee concept through an industrial style of collective bargaining. For there is no question that if faculty members rely as a steady tactic upon the use of sanctions — that, if with the threat of a strike in the back ground, they pursue the brinkmanship policy of the unions — boards and administrators will look to the sources of their own power, and institutions may have lost the opportunity for that cooperative effort which is indispensable to their welfare."*19*

Characteristically, Dr. Davis places an altruistic goal — that of establishing self-governing communities of scholars — above that of the future of the A.A.U.P. He decries recourse to power, which unionism implies and legitimises solely in terms of its effectiveness. He prefers progress at local level to ensue from assembly, debate and the persuasive exercise of the authority of reason. "The truth" he avers, "is that there are few, if any, reasonable goals that a faculty cannot accomplish for itself" if its members are persistent and imaginative,

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17. Ideally, and with certain safeguards, A.A.U.P. prefers that the "faculty-elected council or senate should apply for election."

18. Quoted in the A.A.U.P. Bulletin, Autumn 1968, p. 317.

19. A.A.U.P. Bulletin, Autumn 1968, p. 320.

and if it draws when necessary upon the experience of the professional associations." *20*

Yet, the root of his opposition to unionism cannot be the intrusion of an "external agent" for the most conspicious attainment of the A.A.U.P. over the years has been in tenure cases in which it is surely an external agent.

Dr. Davis identifies two fundamental and crucial choices; the first is between the word and the sword; the two in his view are incompatible. The second is between government by administrators and government by university teachers, for Galbraith-like, he predicts that the growth of unionism will provoke a countervailing authoritarianism in university administrations, accelerating tendencies which it was earlier argued, are arising as universities grow in size. He appears to imply that it is impracticable for a university teacher to sustain multiple roles, to differentiate succcessfully between them as situational needs dictate, and that he cannot resolve role-conflicts should they arise. Indeed, it can easily be inferred that just as in drama, role conflict is so often the heart of the situation, the structure of high tragedy, so serious consequences for universities and academic freedom may attend institutionalisation of the employee role.

Dr. Davis's prognosis and the inferences I draw from it should cause us deep concern in Britain. And most of all it should concern those in Government who by submitting University teachers to the tyranny of the kind of incomes policy prevailing from 1966-9, unwittingly encourage 'unionism' and, thereby breed attitudes within the university community potentially harmful to academic freedom. To mitigate the effects which can be foreseen, the governing bodies of British universities and especially their lay members can do two things, for it can safely be assumed that the university sector will be obliged to engage in the power-politics from which emerge libations from the common pay-master. Each institution can redouble current efforts to increase the effective participation of academic staffs in the formulation of policy including policy on salary scales and grading. Secondly, universities may unite with the A.U.T. to wring from the Government the kind of salaries which will bring widespread content to their academic staffs.

The A.U.T. for its part, must reflect whether or not it is desirable, on balance, to insist upon the setting-up of local collective bargaining machinery complementary to that at national level. Vigorous, local "union" action may simply aggravate the tensions between junior and senior academics and between academics and administrators which are beginning to emerge as a product not only of larger scale but, lately also as a direct outcome of student sit-ins and related disruptions. It is essential that the new, professionally-staffed associations acknowledge the responsibility that now lies on them to balance professional-

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20. For this conclusion I am indebted to Dr. Dennis Chapman, Trustee of the A.U.T. and President 1969 — 1.

academic and economic interest and for individual delocalised institutions to recognise that in these bodies they have potential allies rather than opponents in the pursuit of the goals which really matter—academic freedom for the individual scholar and maximum autonomy for universities.

For the universities some foresee a potentially greater harm, namely, direct intervention by the paymaster in policy areas in which hitherto official influence rather than authority has been felt. But I must first describe the novel, two-tier negotiating machinery agreed by the British Government and university interests in April of this year, before discussing this critical issue.

Prior to 1970, there was no formal machinery of collective bargaining for unversity teachers. Up to 1967, the universities through the Committee of Vice-Chancellors and Principals (C.V.C.P.)[21] and the A.U.T. each and separately made submissions to the University Grants Committee. The U.G.C. advised the Treasury, or, latterly, the Department of Education and Science who got in touch with the Department of Employment and Productivity and the Treasury. A sub-committee of the Cabinet itself might decide the larger claims. What transpired within government machinery was always concealed from C.V.C.P. and A.U.T. In due course, the Government announced its decision in Parliament and the U.G.C. uttered a brief "considered reply" to A.U.T.'s salary submission. These rare and unsatisfactory arrangements were justified in the interest of university autonomy and sanctified, I venture the thought, in that of official parsimony.

However, it transpires that the U G.C., the much vaunted "buffer" between government and universities, was inclined to be almost passive in salary matters if only for the reason that its essential protecting constituents, namely those drawn from university life,[22] were disqualified as interested parties from taking part. The device of appointing two 'lay' members for salary items appeared to A.U.T. eyes never to operate effectively. Hence, the Association increased its determination to secure proper machinery for salary determination. The choice lay between an independent review body, encouragement to believe in the efficacy of which was given by the report of the National Incomes Commission on University pay in 1964, and negotiating machinery.

21. The C.V.C.P. did not in fact represent universities as they themselves have always been careful to point out. Their membership of the C.V.C.P. was individual and though clearly ex-officio, not representative. Hence, their collective competence and undoubted influence in salary (as in other) matters gave them real authority without formal responsibility. As C.V.C.P. actually enjoyed a virtual monopoly of speaking for the universities while formally declining to do so, the A.U.T. was in the disconcerting position of being unable to negotiate salary matters with authorised agents of the "employers" for so long as this self-appointed group chose to play the vacant roles.

22. As Sir Eric Ashby cogently argues, three quarters of U.G.C. members are academics; thus the universities are in "the hands of other dons." **Hands Off the Universities** The Foundation Oration delivered at Birkbeck College, London, 1968, by Sir Eric Ashby, F.R.C.

The decision to favour the latter was taken during the period of standing references of university pay to the National Board for Prices and Incomes (1967-70) whose ill-starred venturing into university reform is another story.

Essentially, the new and, as yet, untried model provides that representatives of the legal employers, the universities, and their employees' representatives, A.U.T., reach agreement under independent chairmanship at level 'A' Both parties then jointly bargain with the government 'paymaster' in the person of the Secretary of State for Education and Science. The pay master is not the 'employer' at level 'B' (unlike his counterpart in France where university professors are civil servants) and at level 'B' meets employer and employee who have reached an agreement. Such is assured at level 'A' by according powers of a referee to the independent chairman. At level 'B' unresolved differences between the university sector and the government may be referred to an arbitration panel.

Two stages are necessary, first because university institutions have few or no finanical means to meet general salary increases and cannot therefore conclude effective agreements with their staffs, and, second, because university autonomy can best be preserved by exluding the government from discussions between the two university parties. A critically important feature of the new arrangements is the convention that new proposals affecting university policy cannot be introduced at level 'B', this effectively precludes government representatives from calling new tunes. *23*

Those familiar with British affairs will naturally demand to know what part the U.G.C. is to play. The key to this lies in the constitutional position of the Committee as confidential adviser to the Secretary of State for Education and Science. In this capacity, the U.G.C. clearly cannot be a principal party to agreements at level 'A' nor could it retain its advisory role if it were to act executively for the government at level 'B'. On the other hand, as buffer between the government and universities it must, Janus-like, look both ways. For this reason it must participate in some way at level 'A'. This it can do by taking the role of observer with the right to speak. Fears that U.G.C. representatives might be seen as government 'spies' in the university camp have been dismissed by the university parties.24

On the contrary, it is hoped that the U.G.C. observers will be able to contribute to the success of level 'A' especially if they are encouraged to initiate discussions on topics it is desirable should not be brought up

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23. It is my understanding that if in the course of considering the report of level 'A' to level 'B', government officials wish to make suggestions, these be referred back to level 'A'. The Minister of State at the D.E.C. has made it clear that at level 'B' the government will not confine itself solely to the financial implications of reports from Level 'A' to Level 'B'.
24. My personal interpretation is that their view was more an expression of confidence in the present Chairman of the U.G.C. and his colleagues than in the formal constitutional device itself.

at level 'B'. Incidentally, the universities not the C.V.C.P., will appoint the 'employer' representatives, thus bringing to an end one of the less satisfactory features of the status quo.

Will this unique set of procedures work, and if it does, will there be a serious loss of academic autonomy? One can only speculate at this stage but there are certain pointers. First, let us recall that the staff salary bill constitutes one half of total current expenditure by universities and around two-thirds of the re-current grant from central government, and for that reason is now too large a sum for Parliament to vote without debate and scrutiny.

Second, it is predictable that as university autonomy in Britain has never been held to enshrine the right of academics to draw upon public funds without limit, certain customary government constraints will continue but with the difference that the differences that he university parties will be one stage nearer 'the focus of decision.[25] These include determination of the global salary bill, the fixing of national scales — which prevents competitive bidding-up of salaries and the development of a financially-based hierachy of competence within the university sector — and the control of overall staff-student ratio — which helps to guarantee minimum standards of staff provision, to ensure economy and also to avoid ranking institutions by excellence.[26] It is true that the U.G.C. rather than D.E.S. has been responsible for determining and even more, for administering many of these decisions and there is no prima facia reasons why it should not continue to be alert to the possibility of reform, to be mindful of economy, and to take sufficient cognizance of national needs for trained man-power and research to 'purchase' the degree of autonomy which satisfies.

It is predictable that the government will be tempted to level 'B' to call upon the universities to give ground (and therefore autonomy) in three ways: to increase productivity. to introduce scales differentiated by subject group and to change the balance between research and teaching in favour of the latter.

'Productivity' is a concept notoriously difficult to apply to higher education or indeed to any form of education. Most scholars now agree that it is virtually impossible to measure and predict changes in 'value added' by university resources, first, because one cannot attach a meaningful 'value' to the 'input' (i.e. the enrolling student) and secondly, because the aggregate worth of the 'output' of graduates and research derives from so diverse a range of employments and over

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25. It would in my opinion, be desirable that representatives of the Treasury and the Department of Employment and Productivity be present at level 'B' in order that government and supplicants' views be the better identified and examined. The D.E.S. will formally speak for the government but may not have much discretion in fixing the aggregate salary bill, for example.
26. As Ashby says : "It is the underlying philosophy of the U.G.C. that the material opportunities for achieving distinction should not differ....." loc. cit.

periods of up to forty years or more.[27] As my distinguished colleague Professor Mark Blaug concludes: "We search in vain when we search for the productivity of universities." [28]

Though student 'input' and the 'outputs' cannot be measured, it is still possible to change 'productivity' by taking students through given courses with fewer resources. This was postulated by the National Board for Prices and Incomes in the context of national productivity policy and the need for economy in any future expansion of student numbers: "This backgrounds demands.....that we consider how best the levels and structure of university salaries should be altered with a view to promoting lower costs per student at a difficult moment for the economy." [29] The treacherousness of this ground has caused the A.U.T. to be very careful to describe deterioration of the staff/student ratio as leading to "more exacting work," reserving the freedom to reject such ratios as being partial. More serious is the dilemma in which we find ourselves if challenged to prove that a given proposed worsening of staff/student ratio will depreciate the value of graduate 'output' For, having agreed with intellectual honesty and conviction that one cannot measure such changes, we cannot furnish any such proofs. Thus, on economy grounds, the government could insist upon a finite saving in money at no proven academic cost and at the same time compel universities to change teaching methods from say tutorials to small seminars, a choice they have hitherto assumed to be a purely academic, professional one.

If changes in the worth of university products cannot be measured, there still remains the argument that society should nonetheless acknowledge the voting public is well accustomed and placed to make value judgements and to convert them into appropriate financial terms. However, there has been marked official reluctance in both the U.S.A. and Britain to do so. Hence the A.U.T., perceiving that other groups have been able to gain official approval for "productivity" pay agreements, has recently adopted the argument first developed by Professor William Baumol, Machlup's successor as chairman of A.A.U.P.S. Committee 'Z' and Dr. Peggy Heim.

Briefly, and as I understand it, the argument runs as follows: higher education produces two outputs — research and trained personnel. These are consumed as inputs by the economy and, as a consequence, man-hour productivity rises over the long term.

Real incomes in the sectors which employ university outputs rise. Thus university activities raise incomes in non-university sectors.

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27. The choice of an acceptable discount rate with which to bring the aggregate of future net additional worth back to 'present value' would alone enter a destructive degree of arhitrariness into any such calculation.
28. BLAUG, M. — **The Productivity of Universities,** Universities Conference, Spring 1968, p. 19, Printed by the Committee of Vice-Chancellors and Principals and the Association of University Teachers jointly.
29. National Board for Prices and Incomes. **Standing Reference on the Pay of University Teachers in Great Britain. First Report.** Dec. 1968, para. 46.

Being unable to improve their own man-hour productivity in any continuous and significant way, university teachers do not enjoy the pay rises they generate for others. University teachers thus find themselves in the paradoxical and untenable position of contributing substantially and over the long run to the relative decline of their own incomes.

To this even the most self-sacrificing of scholars, let alone those on the margin of doubt as to whether or not to enter or leave the profession, will sooner or later decline to be party. Baumol and Heim conclude, "In a world in which standards of living rise continuously, no occupation is willing to be singled out as the recipient of stationary levels of remuneration. If the income of some professions lags too long and too far behind that of the rest of society, the number and quality of persons who are willing to continue to practice it will soon begin to decline." [30]

British university teachers will recognise in the latter sentence the germ of the argument so powerfully advanced by the National Incomes Committee in 1964 and by Professor Michael Fogarty, for the A.U.T. in our submission to the National Board for Prices and Incomes in 1967.

So brief an exposition of the central argument does ill-justice to a case which is vividly set out and meticulously substantiated. For productivity-orientated incomes' policy whereever it may be visited by government upon universities, British and American experience implies a few object lessons.

Emphasis on man-productivity discriminates against groups who, by the intrinsic character of the process in which they are engaged, cannot furnish proofs of improvements year after year. Indeed, it victimises those whose professional integrity and training forbid the substitution of assertion for proof. Further, it inexorably debilitates the nation's educational corpus and, finally, it iniquitously rewards groups who have contributed nothing to changes in their productivity while withholding rewards from those whose work is the source of these changes. It is to be hoped that the Minister's representatives at level 'B' will show that they have taken heed. Otherwise, productivity bargaining may be a threat to university autonomy in Britain.

Economy may lead government representatives to introduce subject differentials. If the University parties use "competitive equivalence" arguments [31] the official side may retort that it is unsound to raise the pay of professors of, say, ancient history, by the same amount as is necessary to retain the services of, say, professors of aeronautical engineering. Yet, within the profession, no distinction, other than that measured in purely scholastic terms, is made between scholars.

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30. A.A.U.P. Summer Bulletin, 1968, p. 189.
31. The A.U.T. developed these under Professor Michael Fogarty's leadership five years ago.

If an outside agent were to impose an economically determined hierarchy of remuneration upon that which derives from scholastic attainment there could be serious long-term and prejudicial results. In the short-term, friction between colleagues would be generated to the detriment of free interaction between them and damage to the fundamental concept of a university as a multi-disciplinary community of interacting scholars.[32]

Finally, there is reason to suppose that official interest in the balance between teaching and research, first evinced by the N.B.P.I.[33] will continue. This too is a far from simple affair. It is not easy to define 'research' nor to distinguish clearly between activities which contribute to it and those which aid teaching. For example, can one clearly say to which and in what proportion reading the learned journals of a discipline contributes? The way in which most pure and applied science research is organised in British universities does not help either for the bulk of it is done in close collaboration by supervisor and student and frequently leads to the publication of papers in their joint names. To what extent does the supervisor teach his student in contradistinction to researching?

Undeterred by these and other difficulties the Vice-Chancellors' Committee launched a three part survey in late 1969 which is designed to establish a few facts by inviting a sample of respondents to keep a detailed diary of their activities over short periods. The six categories into which activities are divided by the survey include private and free time (sleeping, family contract, recreation). From this latter, if from no other, we can hope for some startling revelations about the activities of our colleagues. One may also pray that this survey, when complete, will persuade the government to leave the question entirely to us.

In sum, it appears that in pursuing economic objectives through collective bargaining a powerful professional association can perceptibly influence relations between members of universities intra-murally. Likewise, at national level, such activity may materially affect the delicate balance between state and autonomous university institutions. Whether or not that balance is adversely affected and in what degree will depend very much upon movements in the long-term 'exchange-rate' between autonomy for public service. If this is to be maintained at an acceptable level in Britain, the universities and the A.U.T. must have and be seen to have ceaseless regard for reform, professional competence and economy. For the University Grants Committee, however able and dedicated to the defence of university autonomy its Chairman, staff and members may be, will be powerless if they do not.

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32. It should be noted that in Britain university teachers having clinical responsibilities under Regional Hospital Boards have separate, higher scales.

33. In its First Report on University Pay, the Board attempted to create extra incentives for exceptional teaching by instigating small "merit" supplements. Both the quantity and the quality of teaching were to be considered.

UNIVERSITY AUTONOMY AND ACADEMIC FREEDOM IN THE CONTEXT OF CHANGING CONDITIONS IN ASIA

by

Murugesu Pathmanathan
Faculty of Economics and Administration,
University of Malaya,
Malaysia.

The theme of this conference is "The Role of Asian Universities in a Changing World." The term Asian is really a shibboleth and a misconception. The term Asian has essentially meaning only in its geographical context. When we say Asian we are attempting to hold in our minds a common image of completely different groups of people, characterised by ethnic, cultural, linguistic and religious differences. Asia is really a vague and very tenuous concept. It is really nothing more than a geographic idea. In contrast to the image of Asia, the images of Europe and America and even Africa, present some elements of conformity totally missing in Asia. A glance at S.E. Asia viewed simply as a microcosm of the macrocosm that is Asia reveals the deep cleavages in cultural, linguistic, spiritual and colonial influences.

This has either prevented or made it extremely difficult for the growth of an Asian intellectual commonwealth based on Asian institutions of higher learning, parallel in some way to what existed in Europe in the fifteenth century. The various European universities in the fifteenth century, numbering about seventy — 'constituted an intellectual commonwealth embodying the same ideal'.*1* They were based on a common language, culture and religion. The divisive effects of the Reformation and the growth of nationalist movements weakened their intellectual commonwealth, there has been no Asian parallel to this European feature. With the exception of Santaniketen University in India and Al-Azahar in Cairo, the universities of Asia have been modelled on European and American patterns. During the period of colonial rule in Asian countries, there was very little interaction among the Asian universities, as with most other things. Barriers were evolved that separated the Asian countries from each other and induced a focus whereby Asian countries centred their attention on the mother country of the colonial rulers, rather than on their immediate neighbours.

To maintain that there was autonomy in Asian universities and academic freedom during the period of colonial domination is too

1. ASHBY, ERIC — Universities British, Indian and African, Weldenfeld and Nicolson, 1966, p. 4.

much of a facile assertion. Whatever autonomy or academic freedom there existed was essentially minimal. It is difficult to conceive of university autonomy and academic freedom in the context of political dependency. Political autonomy is a sine qua non for university autonomy. Political autonomy, however, does not guarantee university autonomy.

The concept of university autonomy has been subject to numerous interpretations, not unexpected though, given the workings of the academic mind. Academics are not all agreed upon on the concept of university autonomy. The literature on the subject, far too numerous to cite here, is evidence of the varying interpretations on the subject. In the context of modern conditions no university can make a tenable claim to total autonomy. This is so because universities often derive their legal existence from an act of some external authority. This is usually the State Universities are corporate institutions and as such they should have autonomy in matters relating to their day-to-day business. They should be governed in their daily business by their own procedures and should not have constraints applied on them by external authority. Related to the idea of university autonomy but quite distinguishable from it is the claim of academic freedom, generally accepted to be 'the freedom of scholars and researchers in institutions of higher learning to teach and to publish the results of their scholarship without interference from the institution itself or from outside interests.'[2] This claim can be made against the university as well as by it. Academic freedom rests on two main foundations :

a) The tradition of intellectual freedom, originating in Greece, being revived in Europe, under the cultural impact of the Renaissance, and coming into maturity in the Age of Reason.

b) The idea of autonomy for communities of scholars, which arose in the universities of Europe, in the Middle Ages.[3]

Academic freedom should not be confused with students' rights in general nor with civil liberty. Students have their rights but it should not be forgotten that students are essentially probationers. While academic freedom and civil liberty have a common root, academic freedom is a correlative of the academics' duty — that of communicating the truth.

The features that are most easily identifiable with what is considered as university autonomy were isolated by Sir Hector Hetherington, one of the most distinguished British Vice-Chancellors. To summarise they are :

a) The university should have the right to select its own staff.

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2. WEAVER, RICHARD M. — Academic Freedom: The Principle and the Problems, Intercollegiate Society of Individualists Inc., 1963, p. 3.

3. FUCHS, RALPH F. — "Academic Freedom, Its Basic Philosophy Function and History" in **Academic Freedom,** Oceana Publications, New York, 1964, p. 1.

b) The university should be responsible for the selection of its students.

c) The university should be responsible for the structuring of its teaching programme and for the evaluation of academic standards.

d) The university should be the final authority as regards its research programme.

e) The university should be responsible for the allocation of resources among its various activities.[4]

Different conditions in Asian countries, whether they be economic, political and social compounded by the varying constitutions and regulations governing the activities of universities have conditioned the meaning of university autonomy in the various settings. However, the above conditions were accepted by the Administrative Board of the International Association of Universities as elements of university autonomy which 'are essential — not as special privileges, but as the basic conditions that enable the universities of the world to perform effectively their triple function of educating young men and women to serve the needs of the community, conserving the heritage of culture and expanding the frontiers of knowledge by research.[5]

A more recent interpretation of university autonomy made recently at a UNESCO-sponsored conference on student aspirations and participation in university management stated that, 'Autonomy means the highest possible degree of self-administration by all members of the university compatible with the general principles set forth by the society. This society has the right to make sure that the university works in accordance with the laws and policies democratically determined by the larger community...' The Vice-Chancellor of the University of Malaya, Professor Ungku A. Aziz has suggested that this interpretation of university autonomy should be one of the viable principles in the University of South-East Asia[6] that he proposed recently.

University autonomy and academic freedom will, without doubt, generate a plethora of discussion, with the rapid expansion of higher education in the newer states of Asia especially. This does not mean that the issues of university autonomy and academic freedom had been a non-controversial issue in Asian universities.[7]

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4. HETHERINGTON, SIR HECTOR — "University Autonomy" in Papers of the International Association of Universities, No. 7 — University Autonomy (Its Meaning Today).
5. JAMES, C. F. — Introduction in Papers of the International Association of Universities, No. 7 — University Autonomy (Its Meaning Today).
6. AZIZ, UNGKP A. — "University of Southeast Asia," **Suara Universiti,** Singapore, February 1970, pp. 9 — 12.
7. An example of intellectual controversy in an Asian setting is Leopoldo Y. Yebes, **The University and the Fear of Ideas,** Quezon City, 1956.

In the context of changing conditions in Asia, one broad factor that will probably strengthen concepts of university autonomy and academic freedom is the increasing interaction among institutions of higher learning in Asia. Seminars organised by the Association of Southeast Asian Institutions of Higher Learning and conferences like the current one on "The Role of Universities in a Changing World" are evidence of the increasing interaction. Thinking on regionalism has also resulted in proposals such as the setting up of a University of South-East Asia 'that would be uniquely designed and oriented to serve the special needs for the social, economic, technological and cultural development of the region in general and each of the member countries in particular'. A rationale for the establishment of such an institution is the fact that Asian intellectuals interact very often in non-Asian academic environments, in American, British and European universities rather than in Asian universities. One reason why the concept of university autonomy may be strengthened is due to the fact that where there is an interaction of Asian intellectuals, it is often between academics who share some commonness of political experience. University autonomy and academic freedom are part of the democratic ethos. Asian academics who come from political environments that practise or aspire towards democratic goals would often be the proponents of autonomy and academic freedom. Here again one will not fail to notice the impact of western ideas and ideologies. Asian countries, like countries all over the world are often separated by political ideologies. We have evidence right here. At this international conference, I do not think there are, unless I am mistaken, representatives from the University of Hanoi or the University of Peking. A scrutiny of the list of member institutions of the Association of Southeast Asian Institutions of Higher learning reveals significantly the absence in the membership of institutions of higher learning that are in the so-called Communist Asian nations. Western political conflicts are being replayed in Asia. This is too much of a generalization but in the broad details it presents an accurate picture. This political conflict has been responsible substantially for barriers between Asian institutions. The replay of western political conflicts is far too costly for Asian states, especially for the newer, smaller states of Asia. The current tendency to shift towards political non-alignment as a foreign policy plank is reflective of this realization among some South East Asian nations. Political institutions transferred to Asian environments and based on foreign models, whether they be 'democratic' or 'communistic' are under-going a gradual process of modification to suit the conditions of individual national societies.[8] On the basis of present trends, one could safely predict that over a period of time, very few governments in Asia could be classified under such labels as 'democratic' or 'communistic'. For want of a better term and in the vocabulary of existing jargon, the form of government towards which most Asian governments are evolving can be termed as 'socialistic'. This, and the conditions associated with what has come to be termed as an 'industrial

8. For an analysis on the transfer political institutions see Schaffer B. B. "The Concept of Preparation: Some Questions about the Transfer of Systems of Government" in **World Politics,** Vol. XVIIII, No. 1, October 1965.

culture' towards which many of the national economic development policies of Asian countries are consciously oriented will bring about a number of factors and tendencies that will have the effect of restricting and modifying our present interpretations of university autonomy and academic freedom.

It is not the intention of the writer to act as a proponent for the curtailment of university autonomy and academic freedom. What I wish to state is simply that the various evolutionary and revolutionary forces forging the modification of political institutions and the drive towards economic development with its attendant consequences of industrialism, urbanisation, mass communications, and a technologically oriented society, a number of factors will surface and may be operative in adding further parameters to university autonomy and academic freedom.

The State as the Instrument of Change : In the new states of Asia, the role of the state as an instrument of change is assuming increasing dominance. The state has become the primary agency for the engineering of social change through the acquisition, control and allocation of a greater part of national economic resources. Changes in the education system is an essential factor in engineering these changes. Different types and levels of training have to be planned for and innovations introduced to the educational pattern. University education will often be transformed. In Asian societies, there has been significant and rapid expansion in higher education primarily as the consequence of the drive to wipe out illiteracy and the provision of mass education. The university cannot continue in Asia as Wilhelm von Humbolt conceived it as the place where the many may come to and the few go on. The university will become more out of necessity than anything else, the place where most will come to and the many go on. Added to the need for the development of mass education, is the fact that top scientific, technological, and managerial talent has become the world's most precious capital resource, and is the new and future wealth of any country.[9] The focal point at which the development of this precious capital resource takes place is often in universities and other higher institutions of learning. To effectively plan and programme this capital resource development, there has to be immense capital investment in terms of libraries, data-recording, reproducing and analysing equipment and other types of scientific equipment. The state is the primary if not the sole contributor of the typical Asian university's financial requirements. This, in fact, is the obvious root of a lot of confused thinking about the nature of university autonomy. Universities aspire for the preservation of autonomy in the face of financial dependence on the state. An analogy at this point will prove more illustrative. Nations which are politically independent have a false sense of independence when they are economically dependent on other nations. It is a disillusioning experience for many national leaders of newly independent states when they realize political independence is

9. CHORAFAS, D. N. — **The Knowledge Revolution,** Allan and Unwin, 1969.

meaningless in the reality of economic facts that point to or lead to dependence on other nations.

Studies made in Britain in relation to the activities of the University Grants Committee shed useful light on the relationship between university autonomy and financial dependence. Since the creation of the University Grants Committee the total income of British universities has risen from sligthly over £3 million in 1920-21 to nearly £ 190 million in 1967. What is more revealing is the fact that analysis by source in per cent of total income shows that Parliamentary grants in relation to the total income of universities have risen from 33.6% in 1920-21 to 82.7% in 1966-67.*10* The isolation of higher learning in Europe from religious influence and the growth of science and scientific education in universities have made them 'sources of technological and therefore of social change, until now they occupy a place as part of the economic foundations of a new type of society. In this new technological society educational institutions have expanded, largely through state finance, not only to exercise research functions, but also to play a central role in the economy and system of stratification as agencies for selection, training and placement of individuals in an ever-widening range of professional and quasi-professional occupations.'*11* Although the movement towards such conditions have been uneven among the western industrial nations and consequently there had been a diversification of university systems, the direction of movement is the same in spite of social and political differences.*12* Comparative studies show that this trend has developed further in America, 'where professionalization has entered the tertiary sectors of education and has resulted in far-reaching modifications of the content of university studies.' In Russia it is fastest, arising out of centralised political control that has aimed at servicing a fast developing economy with the sort of trained and skilled manpower that is required in a technologically oriented society. It has developed slowest in Britain 'where Oxford and Cambridge are still socially divisive institutions and where the response to technological change has been most strongly contained within an educational hierarchy corresponding to the power and prestige of the wider society.'*13* As a result the British Government 'insists on its right to determine the strategic allocation of resources according to social priorities which are legitimated for them by the democratic process and not by the distribution of private wealth.'*14* I have admittedly strayed too much from the Asian context. The observations, however, are relevant. One advantage of the development lag between the more developed and the less developed nations is that in Asia we

10. HALSEY, A. H. — "The Universities and the Stat,e **Universities Quarterly 23.2** Spring 196', p. 138.
11. **Ibid.,** p. 131.
12. **Ibid.**
13. **Ibid.,** p. 132. For a fuller discussion see A. H. Halsey, 'The Changing Functions of Universities in Advanced Industrial Societies,' in **Harvard Educational Review,** Spring 1960, pp. 119 — 127, and Joseph Ben David and Awraham Solczower, 'Universities and Academic Systems in Modern Societies,' in **European Journal of Sociology,** 1962, Vol. I, pp. 45 — 84.
14. **Ibid.,** p. 140.

are in a position to see ahead and have the development problems and their consequences demonstrated in European and American societies. Asian societies are aiming at the adoption of a strategy of industrial culture. This is already operative in Japan. The strategy of industrial culture will result in the 'turning of all activities into commodities. Commodities are produced, distributed, and consumed, also, following what has come to be a necessary division of labour.'*15* University education is fast becoming an industry that exists and thrives on state subsidies. It is an industry responsible for certain commodities — 'knowledge and skills' — many forms of which are essential to the economic well-being of the nation: 'a form of of investment', as Layard says, 'in the future productive capacities of the people who have it ...'*16*

In view of all that has been said above it is not too difficult to predict that the enthusiasm shown by Asian governments for national economic development programmes and the consequent necessity of generating a pool of top scientific, administrative and entrepreneurial talent there will be tendency to apply increasing pressure on universities specifically in relation to their teaching and training programmes.

University Autonomy and Academic Freedom in a Plural Society : Political independence often awakens in the leaders of new states a consciousness of the lack of a sense of nationhood among the peoples of the newly independent states. The birth of a state is not synonymous with the creation of a new society. Often this lack of a sense of nationhood or community results dramatically and tragically in cleavages that shake the foundations of the state itself. These problems are compounded in these Asian states where there are plural societies.

Dangers to university autonomy and academic freedom do not all come from external sources. Autonomy can be endangered when political activity on the part of the student body or on the part of members of the staff — antagonizes the government, resulting in the imposition of further restrictions on the university. A factor that is often forgotten by Asian intellectuals especially those in the new states of Asia is that Asian politicians are over-sensitive to any critical attack on their policies and statements and tend to over-react. University autonomy does not give immunity from political retaliation.

In plural societies, such as Malaysia, there are acute problems of national solidarity and integration. Intellectuals who are accorded academic freedom should avoid the abuse of this academic freedom where it may generate communal dissension or hinder the task of either national solidarity and national integration. This does not, however, mean that members of the academic community should not deliberate about problems of national concern. A criticism of the Malaysian

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15. BETSKY, SEYMOUR — "Concepts of Excellence: Universities in an Industrial Culture", in **Universities Quarterly 24.1** Winter 1969, p. 17.
16. **Ibid.**

academic community by Professor Syed Hussein Alatas that "Malaysia is characterized by the absence of intellectual interest in the different and vital respects of our national life is to a great extent borne out by the sin of omission whereby Malaysian intellectuals have largely either failed to generate discussion on national problems or failed to participate actively and widely in discussions of such problems.*17*

Academic freedom is easily maintained in an environment where the scholar is not only free but is also secluded. 'Freedom and seclusion are the opposite faces of the same coin.' This assertion seems and is both paradoxical to the extent of being ridiculous because there will result in the future in many Asian universities. as it has already resulted in some, the trend whereby there will be an 'shift in the body of the knowledge handled and propagated by the university,' resulting in the 'consequent inescapable change in the relationship between work in the universities and the practical concerns of society.'*18* The force of developments will abolish the 'ivory tower' environment and replace it with the 'market place.' There is a crying need for intellectual activists in Malaysia. "The position of the intellectual activists" writes Erwin D. Canhem, editor of The Christian Science Monitor, "is more important than many realize. They provide a cutting edge and a solid shaft for political doctrine. They are themselves mass communicationrs of talent, they greatly influence youth."*19*

As stated earlier there should be a realization of the need to channel intellectual activism constructively. It is quite apparent that heated controversy in an open manner in the context of a plural society faced with problems of national integration is not possible. In this respect, it would be the responsibility of the academic community to self-impose some degree of constraint on open controversy that may possibly lead to misinterpretation and consequent divisive effects in the particular context of Malaysian society.

Intellectuals have a duty to society in a role that is best termed as 'a constituency of conscience'. One of their primary roles, which is more important than their role as specialists is 'their role as guardians of the moral legitimacy of society's stated values and purposes.'*20*

I would like to conclude by citing two quotations together with modifications to these quotations by Sir Hector Hetherington. One is by Wilhelm von Humbolt and the other is by Edmund Burke.

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17. ALATAS, SYED HUSSEIN — "National Integration," **Suara Universiti** Singapore, February 1970, p. 34.

18. BETTERIDGE, H. T. — "Academic Freedom" in **Universities Quarterly** 23.2 Spring 1969, p. 191.

19. For an interesting discussion on the intellectuals' place in the politics of a post-industrial society, see Carey McWilliams, "The Intellectual as a Political Force," **Playboy,** February 1969, p. 88.

20. **Ibid.,** p. 206.

'The State should always bear in mind that it does not and cannot do the work of a university: and that it always becomes a hindrance when it interferes.' And it may be added that the State itself is stronger when it holds in its universities independent centres of far-ranging thought.

'The State is a partnership not only between those who are living, but between those who are dead and those who are to be born.' It cannot escape a close concern with the issues of the immediate present. But these are not the whole. The universities share and ought to share its contemporary concerns. But they have it peculiarly in their care to look to the past and to the future. They are on the frontier: and therein lies the possibility of their special service. For that service, if they are to meet it worthily, they need their freedom.

UNIVERSITIES AND POLITICS IN SINGAPORE

by

R. S. Bhathal,
University of Singapore,
Singapore.

Dr. Toh Chin Chye, the Minister for Science and Technology in the PAP Government and the Vice-Chancellor of the University of Singapore, in his speech to the members of the University of Singapore Society said :

"The Scandinavian countries and their universities are admirable examples of being distinctly Danish, Swedish, Norwegian and Finish and yet equally eloquent in other European but foreign languages, particularly English. And unless we give our university an image after ourselves, we face the danger of producing graduates who have become a mutated breed of pidgin Englishmen and Englishwomen".

This is a very interesting statement, but the question we must ask and answer is what makes the French, English, Danish, Swedish or any other European university distinct and European but not Asian. The answer it would appear is fairly simple and seems to have been overlooked by many speakers in this region who have ventured to speak on the structure and function of the university in Singapore (and Southeast Asia). Part of the trouble lies in the attempt by all speakers to rely on their knowledge of the English universities and their peculiar enviroment and to project ideas which are suitable for a different set of social conditions on to the society here. Perhaps they do not realise that the structure of the society in Singapore is Asian and not English, and has not evolved out of the culture of may pole dances. Society here is facing unique problems which must be answered by understanding the social structure and political realities of the situation in Singapore.

The French University is distinct because it embodies in its very structure the aspirations and ideals of French culture and heritage. The most obvious characteristic of the university is that the majority of students and staff in the university are French. This is an almost trivial assertion about French society. But when stated in an under-developed country it becomes an important political issue. Lee Kuan Yew, the Prime Minister of Singapore, in a speech delivered to the members of the University of Singapore has set out the politics involved :

".....out of a total of 33 heads of departments in the university, 11 were citizens. Of 24 professors, 8 were citizens. Of the 45

readers and senior lecturers, 19 were Singapore citizens; of the 124 lecturers, 51 were Singapore citizens. And in the senate out of a total of 45 members, 18 were Singapore citizens. So apart from talking about other things — about academic freedom, university autonomy, I ask myself: what would the Prime Minister of Britain feel if he were to hand over a large sum of money to a grants committee that annually doled large chunks of it to committees, senates heads of departments, two-thirds of whom were Australians, Frenchmen, Americans, Indians, Pakistanis, West Indians? What would he think?"

Many universities in the underdeveloped countries are local in the sense that the students are all local inhabitants. The staff are normally European expatriates, but the picture is slowly changing (for example, 71 percent of the academic staff at the University of Singapore are locally domiciled). This is the natural result of history, and in a large number of these countries. Western expertise and investment will still be needed for along time to come. (Almost daily, Singapore has an inflow and outflow of Western experts. Western experts have to be employed even to set up a School of Southeast Asian Studies). This fact must be grasped by the region because if it is not, it can lead to wild accusations of exploitation and neocolonialism and a hostile attitude towards the richer nations and the individuals who have come here to render their very generous services to this virile but young nation. Furthermore the very existence of the countries of the region as separate political entities depends very much on a Western military and economic presence here.

Importing experts to solve the problems of this region has a drawback, unless their professional skills are passed on to the local people, they will be lost when the expert finishes his contract. A good instance was the Indonsian confrontation of Malaysia. Although Malaysian, British, Australian and New Zealand forces were used in the war, it was the British army which felt the full experience of the military operations. This expertise is now in danger of being lost to the people living in this area as the British army pulls out of the Malaysian Singapore region.

The student population of the University of Singapore reflects more truly the wide ethnic origins of the Singapore community while Nanyang University students represent the Republic's major racial group. The University of Singapore calendar shows that of the students 85.5% are Chinese; 7.5%, Indian; 2.5%, Malay; 2.5%, Ceylonese; 1% Eurasian; and 1% other. Some 71% of the staff is locally domiciled and most of the positions where major university policy is decided are in the hands of local staff. But a rather curious state of affairs exists over the academic staff association. At present, two academic staff associations are in being — one mainly identified with the expatriate staff; the other with local staff. Again this is the outcome of the University's history, and it is hoped that in the near future a single academic staff association will represent the interest of the entire academic community.

The second and perhaps the most important reason as to why the universities in France are distinctly French is that the language of instruction is French in all fields of knowledge. The student uses French — his mother-tongue to express his thoughts and emotions at the university level, the apex of our educational systems. He is preserving and extending his knowledge of his mother-tongue and the cultural heritage that goes with it. At school, at home, on the playing field, at the movies and even when he making love, he is using the French language. Every French boy and girl is put through an educational system which churns out French nationals and patriots. Perhaps this is part of the answer to the complaint made by Lee Kuan Yew.

"The other trouble is that our community lacks in-built reflexes : loyalty, patriotism, history or tradition, unlike that of the French or the English. Even an American whose society is a relatively new one can tell you, all about George Washington or Abraham Lincoln. For he has history."

Somehow or other the Singapore educational system fails to serve as the melting pot of the nation. The school teachers represent diverse educational and cultural orientations. "English" educated, "Chinese" educated, ',Malay" educated, and "Indian" educated. A similar situation also exists in Malaysia. The nation's values and traditions are instilled into the young by men and women who do not themselves form a coherent group with a common set of values. This state of affairs one can correct easily enough. Unfortunately the past history of the nation and the talk of "battles fought and won", cannot be rewritten to stir up a sense of nationalism and a spirit of patriotism. A Singapore or Malaysian schoolboy has no George Washington or Gandhi in his past history — the history of his country has been a history of domination by foreign countries. He has not fought and won any battles and the more recent ones have been fought for him. The fall of Malacca in 151 was perhaps the last big battle his nation ever attempted to fight and that they lost. The ego has been deflated, and the history books which tell of battles his people lost are hardly inspiring. But the Singapore or Malaysian schoolboy in a hundred years from now will be able to talk of the fight for independence won by Lee Kuan Yew and Tungku Abdul Rahman and the social programmes their respective governments undertook to create modern industrial societies.

To understand the dilemma posed by the educational system in Singapore consider what would happen at the University of Sorbonne, if the majority of the members of the academic staff were Chinese, the medium of instruction and language of government and business were Chinese, while the masses in the society at large still spoke French and understood a few words of Chinese. Would this university still be considered a distinctly French university or would it be a Chinese university , Would it serve the aspirations and cultural traditions of the French people ? French politicians would be making

speeches on the same lines as the leaders of the developing countries. They would denounce the university as a Chinese university, out of touch with its own society. The situation just outlined is perhaps over simplified but it does bring into perspective what the University of Singapore is facing today. The remark that the University of Singapore is the only "English university" in the area can now be better appreciated.

The political situation faced by Singapore has been stated by Lee Kuan Yew in his talk entitled, "New Bearing's in our Education System." He said :

"There are only 2.7 million Jews in Israel, surrounded by 200 million Arabs, who are divided into many Arab States, but they are all bent on destorying Israel. It is regrettable for a country to be found in such a position. But this is the position in which we have found ourselves."

The message is clear but the analogy is dangerous. In Singapore the population is multi-racial but with a predominantly large Chinese element which itself is divided into a large number of dialect groups. The classification of the population in Singapore in terms of racial origin is as follows : (in thousands) Chinese, 1,427.0: Indians and Pakistanis, 156.6 : Malays, 276.1 : Eurasians, 16.9 : and others, 19.3. Comte once asked of France : what would happen if the hundred best generals, the hundred best diplomats, the hundred best government adviser, etc, suddenly disappeared ? Nothing. Society would carry on. On the other hand, he says, let us suppose that the hundred best engineers, the hundred best bankers, the hundred best entrepreneurs of the society disappear then, the whole working of society would collapse. If we divide the above numbers by ten and ask the same question of Singapore and Malaysia, the answer would be chaos and revolution on both accounts. This unfortunately is the sad truth of the situation in Asia. It is also interesting to note the remarks of Carl Kaysen, the Director of the Institute for Advanced Study at Princeton :

"A major feature of the Asian scene will continue to be the presence and voice of Communist China, by far the largest power in the area or the world in terms of population, located centrally and thus bordering on a great number of other states, the strongest militarily of all states in the region and the only one possessing even a few nuclear weapons. Yet, despite its central position and its neighbours, China, during the near future, will remain a basically weak nation, inferior in economic potential to Japan and in no way comparable with the two super-powers. Even after the settlement of the war in Vietnam, major points of conflict between China and the United States will remain and are unlikely to be settled soon. China will certainly continue to exercise propaganda and political pressure against the non-Communist states of Asia and even occasional military pressure against those with vulnerable borders such as India

and Burma. Her influence on the large overseas Chinese communities in Singapore, Malaysia, Thailand, and the Philipines will continue to provide a means of creating political unrest in all those countries."

Given the political reality and the racial origins of the people of Singapore, what kind of a role can be envisaged for the universities in Singapore ? Nanyang University conducts most of its courses in Chinese and was founded, as the Vice-Chancellor, Professor Huang, says, "by the sweat and toil of the people of Singapore." ("People" here refers to the Chinese community). In the context of what we have been saying of the French university and Dr. Toh's remarks on the Scandinavin universities and the population figures which show the predomince of one racial group, it would be natural to conclude that Nanyang University is much closer to the concept of the National University on cultural grounds than the University of Singapore. It represents the culmination of the "Chinese-medium" primary and secondary school system. It also represents the seat of learning for the propagation and preservation of the Chinese cultural traditions and heritage. Here the Chinese boy grows up in the atmosphere of his mother-tongue, he listens to Chinese classical music, reads the literary books written in his own tongue, learns to appreciate Chinese painting and sculpture, when he goes home he still speaks and converses with his parents and friends in the Chinese language. We could say, as in the French case, that Nanyang University is not divorced from the major part of the society that forms Singapore. In short Chinese traditions values, customs are being kept alive and being modified at the university level. The essential vitality of Chinese civilisation and heritage is being kept alive. The university however poses a problem when it confronts the political reality of the situation that exists in Southeast Asia. Lee Kuan Yew in a speech to the members of Nanyang University stated the problem :

"A resurgent China is already the object, not just of admiration but also of apprehension amongst the peoples of Southeast Asia. And if Nanyang were to become symbolished as an outpost in Southest Asia of Chinese dominance, then we will only have ourselves to blame if we find the position deepened and embittered."

Can the university evolve into something more "Singaporean" or "Malayan" ? Ong Pang Boon, the Minister of Education in a speech to the Nanyang University Convocation noted that the University had been reorganised and "transformed from a hotbed of subversion and agitation into a respected institution of higher learning worthy of its name." The reorganisation of the university and its acceptance into the educational programme of the country are the first signs that the university is being transfomed into a more Singapore-orientated institution. In the near future, it is hoped the university will attract more students from the other racial groups and hence truly reflect the multi-racial structure of the society in Singapore. But for this to occur English will have to be gradually accepted as the language of instruction. To implement policies which affect

the culture and language of a people too rapidly can be dangerous because it is very difficult to pull down the psychological and emotional walls which they have built around themselves without straining the fabric of the society that exists in Singapore (and Malaysia) today. In the present circumstances, the growth of a permissive society in the spheres of culture, religion and language has to be tolerated while at the same time stressing the importance of having a common national identity. What we require of the Chinese, Malay, Indian or Eurasian man in the street is to say: These are my people and I will shed my blood to defend them, irrespective of his neighbour's ethnic origins. When the whole population can respond in this manner, one of the major problems of Singapore and Malaysia will have been solved.

These are the advantages and disadvantages of Nanyang University as a national university. On cultural grounds it serves the same function as the French and Scandinavian universities, but politically it presents a very delicate problem. Can the University of Singapore which has been dubbed an "English University," play the role of the "national university?" Perhaps not in quite the strict sense of the concept as applied to French and Scandinavian universities.

The fact that the medium of instruction at the university is English divorces the university from the mass of the population which is non-English speaking. It is only in this sense that the university is cut off from society, as contrasted with the French and Scandinavian universities. But the problems faced by the universities in Singapore are completely different from those faced by the French and Scandinavian universities. Hence the answers to some of the questions posed by the language and culture problem have to be played down in the interests of political stability and the attempt to modernise the society. It is not the problems of cultural renaissance that have to be stressed, but the social uplift of the community. The problem in almost all underdeveloped countries is one of basic survival. The vital question that the thinking people in these countries should ask is: "How can we provide the man in the street with a decent wage, working conditions and a place under the sun where he may grow up with the dignity of a man and not live the rest of life as a wretched, half-starved, under-nourished, pathetic human being." The cultural problem will take care of itself once the conditions of the living have been made more habitable than what we see today in the developing nations of the world.

It is noteworthy that Lee Kuan Yew's government has formulated the right questions in the context of a developing nation and has transformed the living standards of a vast majority of the people of Singapore.

The Chinese language is the language of a majority racial group in Singapore. However the English language is the language of a minority racial group — the Eurasian population in Singapore. They

are to a large extent the inheritors and propagators of the English language and some of its traditions in this area. The political and government machinery in Singapore is conducted mainly in the English language and the "power elite" is mainly "English-educated." The English educated come from all racial communities, as a group they form an identifiable section of the population in Singapore. For all their weakness and short-comings, it is this group which has provided Singapore its first generation leaders and the smooth and efficient handling of the nation's affairs in the spheres of politics, law, education and business.

Dr. Toh Chin Chye in his talk, "The University in a multi-lingual society," noted that :

"In spite of 150 years of colonialism in Malaya and Singapore no outstanding literature in the English language has appeared." One might also add that in the last 150 years in Singapore and Malaya, no literature, poetry or art worth mentioning on the world market of literature and art has been produced by the Indian and Chinese communities here. In short, neither of these two communities which have clung to their ancient traditions, have produced a writer or a poet of the stature say of India's Nobel winner, Rabindranath Tagore. In literature and art, these communities have not served the function of "productive digits." They have been mere consumers and not innovators or modernisers. However, the strength of the "English-educated," even though they have not produced any great literature, lies in the fact that they have at least served the function of modernising Singapore and Malaysia by accepting and copying English values and traditions (perhaps at certain times over-doing it). It must also be pointed out that the problem we face here is not the preservation and continuation of the Chinese and Indian cultural traditions as such, but the survival of the nation as a political rather than as a cultural entity. We must remember that as far as China and India are concerned they will never be erased from the surface of the world as separate political and cultural entities. Hence they will be better equipped to safeguard, preserve and renew the Indian and Chinese cultural traditions. This does not mean however that we should not have within the university a strong school of oriental studies. We must remember that we are in the heart of Asian countries and as such we will need our own experts to study and analyse the cultural and political traditions in this area.

The University of Singapore cannot as we have seen satisfy the criteria of a national university on cultural grounds but it can satisfy the concept of a national university if it allows itself to be manoeuvred into the political and social programme of the country. Given this role it will act as an agent for transforming the society into a modern and industrial nation. The acceptance by the neighbouring countries of English as a second language and the setting up of the Regional English Language Centre in Singapore means that English will become an important language for the communication of ideas in this region.

This augurs well for the University of Singapore which conducts almost all its courses in the English language.

Hence, the university can also play its part as a centre of learning in this region and attract students from neighbouring countries of Southeast Asia.

The importance of studying the English language we are often told is that it is the "key to an international pool of knowledge in science, technology, and medicine," and because of this English will always remain the main medium of instruction. It must however be mentioned that the English language is also the key to an international pool of knowledge in the fields of politics, modern philosophy law, sociology, modern history. economics and public adminstration. Most of the important works in all these fields of knowledge are written or are available in the English language and to study any of these in depth one must have an intimate knowledge of the English language. It would thus appear that to appreciate and have an access to the workings of a modern society one has to adopt the English language and also some of the traditions and values which go with it. Hence although English is the language of a minority group in Singapore, it serves a very important purpose and outweighs the use of the other languages in providing an access to the tools of a modern industrialised society that is being created in Singapore. The University of Singapore will be the institution of higher learning which will generate the second stage of development of Singapore and carry the country into an industrialised society.

APPENDIX

APPENDIX

APPENDIX A

CONFERENCE COMMITTEES

Patron : Y.T.M. Tengku Abdul Rahman Putra, Al-haj
(Chancellor, University of Malaya & Prime Minister)

Hon. President and Vice-Patron : Y.B. Tan Sri Justice Mohamed Suffian bin Hashim
(Pro-Chancellor, University of Malaya)

Vice-Patron : Professor Chin Fung Kee
(Acting Vice-Chancellor, University of Malaya)

ORGANISING COMMITTEE:-

Organising Chairman : Dr. V. Prakash
Secretary General : Dr. A. Kahar Bador

Dr. Chan Onn Leng
Mr. J. S. Sidhu
Prof. Ahmad Ibrahim
Dr. Sim Wong Kooi
Dr. J. I. D. R. Furtado
Dr. Syed Waseem Ahmad
Drs. Ismail Hussein
Mr. K. C. Tai
Tunku Shamsul Bahrin

PROGRAMME COMMITTEE:-

Chairman : Mr. Beda Lim
Secretary : Dr. F. C. Vohra

Enche Anuwar bin Mahmud
Prof. Tan Eng Seong
Prof. S. S. Dhaliwal
Dr. H. H. Lee
Dr. Chan Kian Siang
Dr. Yip Yat Hoong
Prof. J. L. R. Kirkaldy
Mr. Lam Thim Fook
Dr. A. L. McGregor
Dr. Chai Hon Chan
Dr. Teh Hock Heng
Mr. A. W. Price

FINANCE COMMITTEE:-

Chairman : Mr. Loh Hooi Tong
Secretary : Dr. Ho Coy Choke

Mr. Teh Tuck Soon
Mr. Mustafa Hasan
Mr. Ratnasabhapathy
Dr. Cheng Mee Chooi
Dr. Philip Chang Chong Sing
Mr. Cheong Hock Aun
Mr. Ong Yeen Fook
Mr. Yeoh Oon Lee
Enche Othman bin Mohd. Nor

PUBLICATION COMMITTEE:-

Chairman : Dr. B. C. Stone

Secretary : Dr. Yong Hoi Sen

Mr. Yeoh Hooi Hong
Prof. W. R. Stanton
Dr. Mohd. Zain bin Karim
Dr. George Varghese
Dr. P. H. Stauffer
Mr. J. Doraisamy
Dr. K. K. Nair
Dr. J. B. Lowry
Dr. Tan Hong Siang

RECEPTION COMMITTEE:-

Chairman : Dr. (Miss) Lim Kiat Boey

Secretary : Dr. Tan Beng Cheok

Enche Mukhtar Tamin
Prof. B. R. Sandiford
Dr. (Miss) J. G. K. Manuel
Dr. (Mrs.) Chong Siew Ngo
Dr. Khoo Kean Huat
Mrs. M. C. Puthucheary
Dr. (Mrs.) Loke Su-Eng
Dr. J. A. Bullock
Prof. K. F. G. Hosking
Dr. Chan Kai Cheong
Dr. Cheong Choong Kong
Dr. M. S. Sambhi
Dr. W. R. Winoto
Enche Syed Jallulludin
Dr. S. P. Koh
Dr. J. B. Aylward

Rapporteurs : Dr. K. K. Nair; Prof. S. Arasaratnam; Prof. D. S. MacLusky; Dr. J. I. D. R. Furtado; Prof. A. J. Berry; Dr. J. B. Lowry; Dr. W. D. McTaggart; Mr. J. P. Doraisamy; Dr. J. A. Bullock; Mr. J. S. Sidhu.

APPENDIX B

OUTLINE OF THE CONFERENCE PROGRAMME

Monday, August 24 :	
Morning :	Opening Ceremony
Afternoon :	General Session I
(2 p.m. — 5 p.m.)	*(Asian University and Society)*
Tuesday, August 25 :	
Morning :	General Session II
(9 a.m. — 12 noon)	*(Asian University and Students)*
Afternoon :	General Session III
(2 p.m. — 5 p.m.)	*(Asian University at the Crossroads)*
Wednesday, August 26 :	
Morning :	General Session IV
(9 a.m. — 12 noon)	*(Asian University, Academic Disciplines and Industry)*
Afternoon :	General Session V
(2 p.m. — 5 p.m.)	*(Medical and Biological Disciplines in Asian University)*
Thursday, August 27 :	
Morning :	General Session VI
(9 a.m. — 12 noon)	*(Library in Asian University)*
Afternoon :	
(2 p.m. — 5 p.m.)	Free for Tours
Evening :	
(8 p.m. — 9.30 p.m.)	*INVITED LECTURE* ("Mission of Asian Universities")
Friday, August 28 :	
Morning :	General Session VII
(9 a.m. — 12 noon)	*(Asian University & National Development)*
Afternoon :	General Session VIII
(2 p.m. — 5 p.m.)	*(Asian University and its Administration)*
Saturday, August 29 :	
Morning :	General Session IX
(9 a.m. — 10.30 a.m.)	*(Asian University, Food and Agricultural Industry)*
(10.30 a.m. — 12 noon)	Closing reports by Rapporteurs
Afternoon :	Closing Ceremony
(2.30 p.m.)	(by the Hon'ble Minister of Education)

APPENDIX C

LIST OF PARTICIPANTS

General Session I

(Asian University and Society)

1. **Dr. Francis Wong Hoy Kee** — *The University as a Community.*
   Faculty of Education,
   University of Malaya.

2. **Dr. J. I. Furtado** — *Role of Graduates in The Dialogue between The University and The Community.*
   School of Biological Sciences,
   University of Malaya.

3. **Mr. Khoo Kay Kim** — *The University and Society.*
   Dept. of History,
   University of Malaya.

General Session II

(Asian University and Students)

1. **Prof. Tan Eng Seong** — *Emotional Problems Among University Students — Their Causes and Effects.*
   Dept, of Psychological Medicine,
   University of Malaya.

2. **Dr. J. D. Chari** — *Importance of Students Health Service in Asian Universities.*
   Students' Health Centre,
   University of Malaya.

3. **Dr. Subramaniam** — *The Problems and Challenges of Dental Health in Asian Universities With Special Reference to Asia.*
   Students' Health Centre,
   University of Malaya.

4. **Dr. K. K. Nair** — *The Graduate in Malaysian Society.*
   Dept. of History,
   University of Malaya.

General Session III

(Asian University at the Cross Roads)

1. **D. E. Varley** — *Academic Freedom and The Changing Relationships between Universities and The Government.*
   Vice-President,
   Association of Univ. Teachers,
   University of Nottingham.

2. **Mr. M. Pathmanathan** — *University Autonomy and Academic Freedom in The Context of Changing Conditions in Asia.*
   Faculty of Economics,
   University of Malaya.

3. **Prof. Kazuyuki Iesaka** — *Problems of Universities in Japan in Relation to The Changing Nations and International Scene.*
   Dept. of Sociology,
   Tohoku University.

4. **Dr. B. C. Stone**
School of Biological Sciences,
University of Malaya.
— *Interphace between Teaching and Research.*

5. **Mr. M. C. Greenfield**
Dept. of English,
University of Malaya.
— *The Humanities and University Education*

General Session IV

(Asian University, Academic Discipline and Industry)

1. **Mr. D. K. Ghosh**
UNESCO.
— *Engineers of Tomorrow and Asian Universities.*

2. **Prof. J. L. R. Kirkaldy**
Faculty of Science,
University of Malaya.
— *The Relationship between University and Industry.*

3. **Dr. M. S. Sambhi and Dr. J. B. Aylward**
Faculty of Science,
University of Malaya.
— *Tertiary Chemical Education in The Malaysian Context.*

4. **Dr. L. R. Munjal**
Colombo Plan Advisor,
Federal Industrial Development Authority,
Kuala Lumpur.
— *Future Outlook in The Development of Small-Scale Industries and Asian Universities.*

5. **Prof. James F. Ward**
Dean of Science,
James Cook University of N. Queensland.
— *Changes in Outlook of Traditional Scientific Studies and their Possible Influence on The S.E. Asian Technical Advance.*

6. **Prof. K. F. G. Hosking**
Dept. of Geology,
University of Malaya.
— *Applied Geology in Asian Universities.*

7. **Dr. Teh Hock Heng**
Malaysia.
— *The Role of Physics in The Changing South-East Asian Countries.*

General Session V

(Medical and Biological Disciplines in Asian University)

1. **Prof. Chan Kok Ewe**
Faculty of Medicine,
University of Malaya.
— *Medical Education in South-East Asian Universities.*

2. **Prof. H. S. K. Singha**
Dept. of Surgery,
University of Ceylon.
— *Teaching Surgery in Developing Countries — Aims and Methods.*

3. **Prof. Gordon C. Ring**
Malaysia.
— *Physiological Research and Universities in South-East Asia.*

4. **Dr. Ho Coy Choke** — *University Biological Education in Malaysian Development.*
School of Biological Sciences,
University of Malaya.

5. **Dr. F. C. Vohra** — *Need and Scope For Human Ecology.*
School of Biological Sciences,
University of Malaya.

6. **Dr. J. A. Bullock** — *Asian Universities Participation in Biological Research Programme.*
School of Biological Sciences,
University of Malaya.

General Session VI

(Library in Asian University)

1. **Mr. D. E. K. Wijasuria** — *Information Explosion and Asian University Libraries.*
The Library,
University of Malaya.

2. **Mr. Edward Lim Huck Tee** — *Establishing a New University Library in A Developing Society.*
Librarian,
University of Penang.

3. **Mr. Aziz bin Sheikh Mydin** — *The Importance of University Libraries To Developing Countries.*
Librarian,
University Kebangsaan,
Kuala Lumpur.

General Session VII

(Asian University and National Development)

1. **Prof. H. C. Blaise** — *The University and National Development.*
University of Pittsburgh, USA.
(Visiting Professor,
University of Malaya).

2. **Prof. Ahmad Ibrahim** — *The Role of Universities on Law and Social Change.*
Faculty of Economics and
Administration,
University of Malaya.

3. **Prof. W. R. Stanton** — *University Studies Applied To The Nation's Renewable Resources.*
School of Biological Sciences,
University of Malaya.

4. **Dr. Werner Draguhn** — *Education — The Corner Stone of Socio-Economic Development with Special Reference To The Role of Indian Universities.*
Institute of Asian Affairs,
Hamburg.

5. **Mr. K. C. Tai** — *Scientific and Industrial Changes in S.E. Asia and The Role of Universities.*
Faculty of Engineering,
University of Malaya.

6. **Mr. Mustafa Hassan**
Faculty of Economics and Administration,
University of Malaya.
— *Solving Unemployment Problem and Economics Teaching in Asian Universities.*

General Session VIII

(Asian Universities, Co-operation, Administration and Problems of Expansion)

1. **Mrs. Jean P. Russel-Gebbett**
University of Nottingham.
— *Some Problems of Expansion in Higher Education in Great Britain in The Nineteen Seventies.*

2. **Dr. Chai Hon Chan**
Faculty of Education,
University of Malaya.
— *Developmental Problems of Higher Education in South-East Asia.*

3. **Dr. Sim Wong Kooi,**
Faculty of Education,
University of Malaya.
— *Appraisal of Appraisal System in Asian Universities.*

4. **Prof. Marshal Singer**
Visiting Ford Professor,
University of Malaya.
— *The Relationship of Universities in Developing Countries to The Big Powers.*

General Session IX

(Asian University, Food and Agricultural Industry)

1. **Prof. D. S. MacLusky**
Faculty of Agriculture,
University of Malaya.
— *Agriculture Education and its Development in South-East Asia.*

2. **Dr. George Varghese**
Faculty of Agriculture,
University of Malaya.
— *University Training and Agricultural Development — A Case Observation of Malaya.*