thinking that a massage parlour was doing the recruiting".

The Sixth Report[6] seemed favourably inclined towards an increase in mature students:

> *"...by introducing into institutions more mature students...the universities will be enriched and their capacity for scholarly work enhanced."*

Effects on Academic Staff

A general effect of slow growth, seen in America and Britain already, is the increasing move to what has been called "accountability". That is not only IN the sense of staff being ready to speak up for the values of university education,[7] but also in the stricter sense of being more accountable to the public for how money is spent. Pressures along this line can have a strangling effect on teaching and learning as this extract from a recent American book[8] suggests:

> *"Instructors are being asked to provide evidence that students learn as a result of their teaching...Educators must develop and adopt relevant standards of accountability. Otherwise, state legislatures, under pressures from their constituencies, will impose efficiency criteria which* ***might*** *have a detrimental effect on the teaching and learning process."* (Emphasis added).

While it is unlikely that Australia will move so far down this path it is true that "the day is past when institutions could lay the full blame of student failure on the shoulders of the student himself".[9]

The external pressures for accountability relate to limited national resources and consequent competition from all levels of education, but there are also internal pressures. The incoming student is likely to be more mature and work-experienced, more ready to question the offerings. Again the more extreme view can be found in American writings[10] where the Human Rights Movement sees students as "citizens of the academic community, with the rights, privileges and responsibilities of citizenship, not merely transient guests of the faculty and administration".

Both these pressures, while sharing the same goal of "value for money" may be conflicting. For example, outside pressures may praise moves to reduce or eliminate tutorials whereas the inside pressure from students clamours for more individual attention. Whatever the outcome academic staff are going to be the focus of more public scrutiny during periods of slow growth.

Failure to attract students to the institution or oversupply of graduates could result in the closure of some institutions or parts of them. For example, the Department of Education and Science in Britain proposed closing 37 teacher training institutions. The staff involved, wherever it occurs, face retrenchment and suffer loss unless the staff associations have been wise and strong enough to draft protective clauses covering retrenchment/redundancy. Of interest is the notion of "changing horses in mid-stream" insurance", in which the policy supports a staff member, who wishes to leave his academic post, for the initial years of his retraining or consolidation in his new vocation.

In reality, tenure, which for sub-professorial staff usually means "six months notice", is not as secure as it was once considered to be and legally only insures that six months notice is given.

One of the most difficult effects for the academic staff of Australian universities to bear will be the reduction in chances for promotion. Not only will the number of vacancies in the total system be few, but chances for advancement within institutions will also be reduced. In 1967 staff turnover (full-time lecturer and above) was 28%, in 1976 this reduced to 7.6%[12] and with the trend towards short-term rather than permanent appointments one would expect the turnover rate of permanent staff to reduce even further.

Earlier, mention was made of the relative youth of the professoriate. In fact, the age of the staff in general leads to the expectation that retirements over the next five years "...are expected to constitute only about one-half of one percent of the total academic staff of 12,000".[13] Consequent clustering of staff around the upper salary bars will occur. Greater unionization of staff is a possibility, demanding reduced salary differentials and ways of creating vacancies near the top. One such suggestion, seen in other countries, is the move towards early retirement at age 55. Whether this will be voluntary or "management-prompted" will probably depend upon the rate of retirement required.

> *"The growth of faculty unionism in an era of increasing austerity promises to be the source of the most important intramural conflicts in academe in the next decade."*[14]

Teaching

The changes attendant upon some of the points discussed above, revolve around getting and maintaining student numbers and assuring the public that the physical plant is being used efficiently. Some anxiety may be generated in the academic staff by the emerging need to adjust to the changing clientele; a group about which few assumptions can be made regarding their preparation for university study. In a buyer's market the buyer (the student) does not need to adjust to the demands of the seller. The opposite will become the case, where the university and its staff will have to be more responsive to student needs: bridging courses for the unprepared, remedial courses for those with specific difficulties, flexible entry and exit points to courses, and the development of "learning packages" which will enable a student to learn without a teacher present, are examples of activities likely to increase. Independent learning and flexibility of courses could lead to the end of the "academic year" as we know it and spreading the involvement of staff in teaching over the whole year.

Research

Cut-backs in money for research have occurred recently enough for all to recall. Many of our North American colleagues have already lost the chance for "personal" research (i.e. the chance to follow an idea of one's own) as "contract research" has grown. One writer[15] even asked "How much longer is such (personal creative) research possible at the universities, given encroaching societal pressures?" Many North American departments find that the **cost of tendering** for contracts is so high that they feel they cannot bid. From the sponsor's point of view contract research gives him more control over the limited finance available and hence one should expect it to increase.

A more pernicious effect of graduate unemployment and decreasing financial support for research is the slowing of growth in the basic disciplines, e.g. reduced infusion of new blood at lower levels of staff and research students leading to a reduction in personally initiated research.

Conclusion

> *"Many academics — particularly the older, Australian-born ones — simply cannot believe that the reality of zero growth is upon them at last."*[16]

Some may consider that zero growth means "no change". But "steady state" is a more useful concept since it implies forces in equilibrium; as the students and their requirements change so too must the academic staff if the balance is to be maintained.

For some, (particularly our colleagues in the colleges of advanced education), the steady state may mean a change of job; for **all** of us it will mean a change of attitude.

REFERENCES:

1. **Trow, M.** The implication of low growth rates for higher education. *Higher Education* 1976, 5, 377-396 (p.378).
2. Universities Commission, *Report for the 1977-79 Triennium*, July, 1976, Section 4.1.
3. **Mr. Jack Michael,** Executive Director of The Aust. Assoc. Prof. Engineers. "For the 3000 engineering graduates this year there will be only 1,200 jobs available in 1977". *The Age*, 30.12.76.
4. "About 4,000 of the 8,000 lawyers leaving tertiary institutions up to 1982 will be unable to find jobs..." **Prof. J. E. Richardson,** *The Australian*, 5.1.77.
5. *The Herald* (Melbourne), 24.12.76.
6. Universities Commission *Sixth Report*, May 1975, Section 4.11.
7. **Prof. D. King,** Pres. of Assoc. Univ. teachers, *T.H.E.S.*, 24.12.76. "University lecturers urged to double PR effort".
8. **Davis, R. J.,** Abedor, **A. J. & Witt,** P.W.F. *Committment to excellence*, Michigan: M.S.U., 1976, p. 112.
9. *Ibid*, p. 113.
10. *Ibid*.
11. **Astin, W. A.** *et al.* Faculty development in a time of retrenchment, "CHANGE" Magazine Special Report, Group for Human Development in Higher Education, 1974.
12. Universities Commission, *Report for the 1977-79 Triennium*, July, 1976, Tables 5.6 and 5.7.
13. *Ibid*, Section 3.29.
14. **Ladd, E. C.** and **Lipset, S. M.** *Chronicle of Higher Education*, cited in *T.H.E.S.*, 16.7.76.
15. **Burn, B. B.** *Higher education in a changing world*. New York: International Council for Educational Development. 1976.
16. **Wilby, P.** Cuts follow boom in Australian Universities. *T.H.E.S.*, 17.9.76.

GROWTH, PROMOTION AND RECRUITMENT IN UNIVERSITIES

R. W. Gibberd*

Introduction

A growing organization provides opportunities for faster promotion and higher recruitment rates than those of a stationary organization. Many universities and university departments, which, until a few years ago, were growing at rates sometimes greater than 5% per year, are now already thinking seriously about the problems they are likely to be facing in a *steady state* or no growth situation. Areas of concern are the expected decline in staff turnover, the decrease in recruitment rates and the possible impact on promotion rates. At the Australian National University there are currently three departments in which there will be no staff retirement this century. In my own Department there will be one retirement during the next eighteen years and then, in thirty years' time, 63% of the Department will retire within a period of five years, providing there are no resignations or deaths.

*Department of Mathematics, The University of Newcastle.

Many other Departments are no doubt in similar situations. These departments should be concerned about the possible stagnation that they may experience in a steady state situation.

Some of the possible measures that are being considered to alleviate the apparent stagnation of departments are:

(1) accelerated retirement;
(2) a recruitment policy which introduces a bias against staff in the 30-45 age group (or the largest age-group in the department);
(3) a higher proportion of limited term appointments;
(4) interchange of staff between universities, C.A.E.'s, C.S.I.R.O. and the Public Service.

The impact of no growth on promotion rates in a department has not received as much attention as the stagnation problem, but two possible measures to be considered are:

(5) enforcing stricter promotion policies;
(6) the introduction of another level in the hierarchy, such as Principal Lecturer.

Before introducing any of these measures, it is first necessary to quantify the alleged problems and to determine to what extent the above measures may alleviate these problems. A simple model which quantified the relationship between growth of an organization and recruitment and promotion rates was presented at the 1977 Applied Mathematics Conference. This paper will summarize those results of the model that have a bearing on the above problems. A summary of the actual model used can be obtained from the author.

No Growth?

The western countries have already been concerned by the implications of a zero growth situation during the 1930's, and an unanswerable question is whether the projections today are likely to be more reliable than those made in the 1930's. The projections made in the Borrie Report show that, using the most likely fertility, mortality and migration rates as well as constant tertiary enrolment participation rates, the projected number of tertiary students will remain constant during the next twenty five years (Table 1).

Table 1
Projected Tertiary Enrolments (Universities and C.A.E.'s)

(a) 1973 Participation Rates

Census Year	No. (Thousands)	Intercensal Increase (1000)
1971	168	—
1976	207	39
1981	227	20
1986	229	2
1991	242	14
1996	231	– 11
2001	238	6
(b) Projected Participation Rates		
1976	226	56
1981	282	56
1986	303	21
1991	321	18
1996	307	– 14
2001	316	8

Source: Borrie Report p. 397.

Borrie also assumes that, if there is an increase in the tertiary enrolment participation rate, then the C.A.E.'s should take the extra students so as to preserve a reasonable standard for universities. It follows that unless there are major changes in attitudes to university education, universities should now prepare for quite small growth rates in student numbers and hence in faculty sizes.

Recruitment

When there is no growth, recruitment can only occur when there is a retirement, resignation or death. As has already been mentioned in the introduction, the age distribution of the faculties in many departments is such that there will be low rates of retirement this century, and then very high rates for a brief period in the beginning of the next century. The resulting oscillations in the level of recruitment may or may not be of serious concern to an individual department, but large oscillations in recruitment at the national level is of serious concern. Such oscillations will produce subsequent shortages and excesses of available manpower with periods of easy appointments followed by very competitive appointments. The 1960's and the late 1970's illustrate the two extremes in the ease of appointment in Australian universities.

To obtain a uniform recruitment rate in a given discipline in Australia, the age-distribution of the staff must be the stable age distribution. For a growing organization the age-distribution of the staff will approach the stable-age distribution over a long enough time, but for a stationary organization the only way to obtain the stable age distribution is to introduce a recruitment policy which introduces a bias against staff in the larger age groups. The likely peakiness of the age distribution of, say, mathematicians in Australia should be a matter for some concern to the universities, since it will result in oscillations in recruitment every 35-40 years. Responsibility for these conditions cannot be attached to the individual universities themselves, because each university is free to appoint staff without regard to the general state of the **service** as a whole. Indeed, there is little knowledge of how matters stand and it is hardly likely that any individual university would regard it as its responsibility to try to rectify the situation. In fact, only concerted action by, say, the Tertiary Education Commission could produce a change which, in time, would bring about a better age structure and hence a more uniform recruitment rate.

The possibility of increasing the recruitment rate in a department by lowering the retirement age has often been proposed as a solution to the stagnation problem. If a department has a stable age distribution from ages 25 to 65, no staff resignations and a zero growth rate, enforcing retirement at age 55 instead of 65 will result in four new recruits every six years, instead of three new recruits for a department with 20 faculty. For younger aged departments, the increase will be less. If retirement at age 55 is made optional, and only half the staff do retire at this age, then an extra appointment in the above department occurs only every twelve years. These figures imply that early retirement is not a very effective solution to the **stagnation** problem.

There are other reasons why early retirement should not be encouraged. The percentage of the Australian population who are aged sixty five or more will increase from 8.5% to 10% during the next 25 years. A general trend to lower retiring ages will increase the percentage of retired people even further and, thus, put a bigger strain on social benefits programmes.

Even if it were politically and economically possible to retire senior staff prematurely, it could take away many active and experienced members of staff. Rather than using age to increase recruitment, it would be more appropriate to use **ability** of staff as a criterion. To obtain the same increase in recruitment in the example discussed above, the department would need to retire the **worst** member of staff every 6 years in the case of compulsory retirement at 55, or every twelve years for optional retirement.

Effect of Growth on Promotion

In this section the following assumptions are made. Firstly, promotion is a function of age only, or, to give an equivalent interpretation, the model determines the age of promotion with **all other things being equal.** Secondly, all appointments are made at age 25 and compulsory retirement is at age 65. Thirdly, it is assumed that the department has an approximately stable age-distribution and that there is a **hierarchy** which is to be maintained. A fixed hierarchy means that the ratio of the number of lecturers to the number of senior lecturers and associate professors is approximately fixed as a constant, say, k_1. Further, the ratio of lecturers and senior lecturers to associate professors is also fixed as a constant, say, k_2.

Knowing k_1, k_2 and the growth rate, it is possible to determine the average age of promotion. Table 2 presents the results, assuming no deaths or retirements.

If the value of k_1 and k_2 is taken as .5 and 2 respectively (this gives equal numbers in each grade), then the age of promotion to senior lecturer and associate professor are 38 and 51 years. This is a delay of 6 and 10 years over an organization growing at 5%. The effect of mortality is insignificant but by encouraging about half of your colleagues to resign before they retire, is equivalent to a growth rate of almost 2% and hence is equivalent to lowering the promotion ages by 2 to 4 years. Compulsory retirement at age 55 also lowers the average age of promotion by 3 and 7 years respectively.

If promotion policies do not maintain a hierarchy but rather assume that promotion to senior lecturer will occur on average after 7 years of service, then k_1 will tend to .175, or 3 to 4 lecturers in a department of size 20, rather than the 6 to 7 lecturers using a hierarchy with $k_1 = .5$.

Conclusion

In the introduction, six proposals were mentioned. As a result of the figures presented here, early retirement has little impact on the recruitment rate of a department and besides has many undesirable features. Recruitment policies introducing a bias against certain age groups would be useful at a national level, but would be difficult to implement. This leaves proposals (3) and (4) for further investigation as to their impact on the stagnation problem.

In regard to promotion rates, if a **hierarchial structure** is to be maintained, then promotions will have to be delayed by several years (on average). Either stricter promotion policies will have to be enforced, or another alternative is to introduce another level in the hierarchy, such as Assistant Lecturer or Principal Lecturer.

Table 2
Ages of promotion for different growth rates r, and values of k.

k \ r	10%	5%	2%	0%
.5	30.0	31.8	35.1	38.3
1.0	31.8	36.3	41.1	45.0
1.5	33.9	39.6	45.1	49.0
2.0	35.6	42.2	47.9	51.7
3.0	38.3	45.9	51.6	55.0