thinking that a massage parlour was doing the recruiting."
The Sixth Report seemed favourably inclined towards an increase in mature students: "...by introducing into institutions more mature students... that we 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 academe, but to speak up for the values of university education, 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 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 constituents, 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..."

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 extreme view can be found in American writings 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 pressures may praise moves to introduce into institutions more mature students by introducing into institutions more mature students..." (Emphasis added).

"...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% 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 professors. 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. Consequent clustering of staff around the super salary band will occur. Greater unionization of staff is a possibility, demanding reduced salary differentials and ways of creating vacancies. A more likely 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 at faculty universities in an era of increasing austerity promises to be the source of the most important internal conflicts in academe in the next decade.

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 and human resources are being used efficiently. Some anxiety may be generated in the academic staff by the emerging need to adjust to the changing clientele and which few assumptions can be made regarding their preparation for university study. In a buyer's market the buyer (the student) is not likely 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 being 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 those entered in 1979 will still be there. By this time, 1992, there will be no retirements in the Department.

Research
Cut-backs in money for research have occurred recently enough to recall. Many of our North American colleagues have already lost the chance for "personal" research (i.e., the chance to follow an idea that one's own as "contract research" has grown. One writer even asked "How much longer is such personal创造性 research possible at the university level in the face of 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 financial resource 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." Some may consider that zero growth means "no chance for advancement and promotion." A more realistic concept is that 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.

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GROWTH, PROMOTION AND RECRUITMENT IN UNIVERSITIES

R. W. Gibbard

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 those entered in 1979 will still be there. By this time, 1992, there will be no retirements in the Department.

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 the larger 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:

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

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 and 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 1900's, and an unanswered question is whether the projections today are likely to be more reliable than those made in the 1900'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>
<thead>
<tr>
<th>Census Year</th>
<th>No. (Thousands)</th>
<th>Intercensal Increase (1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>195</td>
<td>-</td>
</tr>
<tr>
<td>1976</td>
<td>207</td>
<td>39</td>
</tr>
<tr>
<td>1981</td>
<td>227</td>
<td>20</td>
</tr>
<tr>
<td>1986</td>
<td>229</td>
<td>2</td>
</tr>
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<td>1991</td>
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<td>14</td>
</tr>
<tr>
<td>1996</td>
<td>231</td>
<td>11</td>
</tr>
<tr>
<td>2001</td>
<td>238</td>
<td>6</td>
</tr>
</tbody>
</table>

(a) 1973 Participation Rates

<table>
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<tr>
<th>Census Year</th>
<th>No. (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>226</td>
</tr>
<tr>
<td>1981</td>
<td>282</td>
</tr>
<tr>
<td>1986</td>
<td>303</td>
</tr>
<tr>
<td>1991</td>
<td>321</td>
</tr>
<tr>
<td>1996</td>
<td>307</td>
</tr>
<tr>
<td>2001</td>
<td>316</td>
</tr>
</tbody>
</table>

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 changes in recruitment at the national level is of serious concern. Such oscillations will produce subsequent shortages and surpluses 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 same. 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 older age groups. The likely peakness of the age distribution of, say, mathematicians in Australian universities is a matter of concern to the universities, since it will result in an increase in the percentage of retired staff prematurely, 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 age 55, or every twenty 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 to senior positions for different growth rates 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 not 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, $k_3$. Further, the ratio of lecturers and senior lecturers to associate professors is also fixed as a constant, say, $k_2$.

Knowing $k_3$ and the growth rate, it is possible to determine the average age of promotion. Table 2 presents the results, assuming no deaths or retirements.

<table>
<thead>
<tr>
<th>$k_2$</th>
<th>10%</th>
<th>5%</th>
<th>2%</th>
<th>0%</th>
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<tbody>
<tr>
<td>.5</td>
<td>30.0</td>
<td>31.6</td>
<td>35.1</td>
<td>38.3</td>
</tr>
<tr>
<td>1.0</td>
<td>31.8</td>
<td>36.5</td>
<td>41.1</td>
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<tr>
<td>1.5</td>
<td>33.9</td>
<td>39.8</td>
<td>45.9</td>
<td>52.1</td>
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<tr>
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<td>35.6</td>
<td>42.2</td>
<td>47.9</td>
<td>51.7</td>
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<tr>
<td>3.0</td>
<td>38.3</td>
<td>45.9</td>
<td>51.8</td>
<td>55.0</td>
</tr>
</tbody>
</table>

Table 2

If the value of $k_3$ is taken as $5$ and the growth rate is 2%, then the age of promotion to senior lecturer and associate professor is 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 $k_3$ will tend to 175, or 3 to 4 new lecturers in a department of size 20, rather than the 6 to 7 lecturers using a hierarchy with $k_3 = .5$.

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 hierarchical 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.