

Article

Research, research productivity and the state in South Africa

Adam Habib and Seán Morrow

Introduction

Academic, scholarly, and applied social research is in crisis in South Africa. As the Department of Science and Technology's (DST's) *National Research and Development Strategy* (R&D Strategy) indicates, national spending on research and development declined from 1.1 per cent of Gross Domestic Product (GDP) in 1990 to 0.7 per cent in 1994, even though South Africa's scientific system now had to support the political and socio-economic aspirations of 40 million, rather than 5-6 million people (Government of the Republic of South Africa 2002:15).¹ This percentage is particularly low when one considers that the OECD countries spend on average 2.15 per cent of GDP across the public and private sectors, while countries like Finland and Korea spend even more, approaching the 3.5 per cent level. This, as DST's R&D strategy document concludes, is disastrous, since 'South Africa's current expenditure is significantly lower than it should be to ensure national competitiveness in years to come' (Government of the Republic of South Africa 2002:17).

But the problem is more profound than aggregate spending on research. Indeed, South Africa's share of global research output has been declining for over a decade, from 0.8 per cent in 1990 to 0.5 per cent by 2001. Independent assessments of total publications by South Africa's public research sector suggest that the country's scientific output has been stagnating for the last decade and a half (Kahn and Blankley 2005; Pouris 2003). Moreover, for some years researchers have been ageing without adequate renewal taking place. This is graphically demonstrated in figures, again provided in the R&D strategy, which indicate that whereas researchers over 50 years of age produced only 18 per cent of publications in 1990,

their contribution to total output had increased to 45 per cent by 1998. Moreover, black scientists accounted for only 8 per cent of total scientific publications at this stage (Government of the Republic of South Africa, 2002:21). In short, South Africa's scientific personnel are mainly white and male, and ageing rapidly. If this is not urgently addressed, it will result in the decline of the country's scientific profile and infrastructure in the coming decades.

In recent years this crisis has galvanised government into action. Not only are there a number of initiatives under way to re-organise and direct funding to the scientific establishment, but also conversations are increasingly being facilitated across a diverse set of stakeholders aimed at understanding the problems at hand and fashioning solutions. There have, for instance, been four meetings of the Higher Education Working Group, which comprises the President and the Vice Chancellors of all higher education institutions. Signifying the urgency of the matter, President Mbeki, with the ministers of Science and Technology, and Public Enterprises, Mosibudi Mangena and Alec Erwin respectively, have coauthored a paper intended to spark a national dialogue on the role of higher education institutions and their purpose in contemporary South Africa (Erwin et al 2005).

Another notable initiative was a conference in June 2005 organised on behalf of the DST by the Africa Institute and the Human Sciences Research Council. The conference focused on how to revitalise research in South Africa. It of course took place as a result of recognition by government and other entities that South Africa's share of global research output has steadily declined for over 15 years. Government is increasingly worried about the implications of this, especially for economic development, political democracy and higher education.²

The representatives of various stakeholders participated in the conference, including among others state officials, higher education and science council managers, private sector and civil society leaders, researchers themselves, and international experts. Almost all were decision-makers within different institutional settings, and were, as a result, collectively in a position to put a negotiated national strategy into effect. The conference adopted a multi-faceted resolution that involved action by all stakeholders.

This paper reflects critically on this resolution, reviewing its viability against the backdrop of existing research on the academy, and the production of knowledge in South Africa. It focuses on state spending patterns and

institutional linkages in the knowledge sector, higher education and other policies, university reforms, and how these facilitate or undermine research productivity. Based on this, the paper considers the viability of the conference's resolution. Thus, it speaks to possible futures for the knowledge system in South Africa.

The conference agenda and plan of action

The conference served as a summit where conversations could happen among a diverse set of stakeholders: firstly, to articulate what they saw as the main obstacles for enhancing research productivity; and, secondly, to negotiate a strategic plan with sufficient consensus to ensure its viability and subsequently facilitate its implementation. The conference structure was designed to achieve these purposes. A significant part of it involved direct conversations among participants on what was to be done.

The agenda of the conference was organised to facilitate action. After an opening welcome by the Minister of Education, Naledi Pandor, a keynote address was delivered by Dr Mashelkar, President of the CSIR in India, on that country's experience in developing its research environment and enhancing its intellectual productivity.³ This was followed by a series of presentations by South African institutional leaders on the relationship between education, training and employment; the existing and potential linkages between knowledge development and the South African economy; the impact of globalisation on research; research funding; the state of public research infrastructure; and, finally, the continental dynamics required by and for a redeveloped science and technology strategy. These presentations were supported by background documents commissioned for the conference from leading researchers in the field, and distributed among participants before the conference (Department of Science and Technology and Department of Education 2005). These presentations and background documents were intended to set the scene, making the most recent information and research on the state of knowledge production and the scientific system in South Africa available to participants. It was hoped that with this foundation, delegates could have informed conversations in the discussion groups that followed the presentations.

The six discussion groups, each focussing on one of the thematic areas identified above, comprised anything between 15 and 40 participants, and were chaired by institutional leaders whose task was to direct the conversation towards practical outcomes. As a result, these forums not only identified the causes of the problems in their respective areas, but also what solutions

were required, from the perspective of different stakeholders. The discussions in these forums were meant to produce consensual recommendations, which were then forwarded to the conference organisers who organised them into an overall conference resolution. This resolution, collated and presented to participants by Dr Adi Paterson, Deputy Director-general within DST, was subsequently adopted by the conference. The gathering was then closed by Minister Mosibude Mangena, who committed government to the plan as stipulated in the resolution. He also committed his department to advancing the conference resolutions within the institutional processes that determine state priorities.

The plan of action adopted at the conference on June 24, 2005, is in the appendix. In brief, it advocates:

- Recruitment and retention of high-level scientific and technological personnel, and promoting partnerships between universities, research councils and industry in support of this agenda.
- Careful attention to the support of advanced study, to its form and content, and appropriate incentives.
- Linking the research agenda to national priorities, and allocating funding accordingly.
- Increasing national investment in research in ways that also leverage quality overseas and domestic involvement.
- Promote South Africa's role in Africa as a leader in the promotion of scientific research for continental development.
- Engage with scientific globalisation so that South Africa becomes a hub in appropriate research areas, and attracts talented researchers.

This plan of action is predicated on keeping good academics and scholars within the knowledge system, attracting a new generation of students to the research professions, encouraging research in areas that have beneficial impacts on the economy and society, and, finally, promoting institutional collaborations within and across national boundaries. Its viability depends on solutions being found to four distinct, but related problems: inadequate academic remuneration and onerous working conditions; the tension that seems to have emerged between advancing equity and realising academic excellence; obstacles that undermine institutional collaboration within the higher education and science council sectors, and the poor quality of senior managers in the knowledge system. Each of these is considered in turn.

Research funding, academic remuneration and working conditions in the Higher Education Sector

How is a quality workforce to be developed and retained within the knowledge system? First, academics, researchers and other knowledge workers need to be adequately remunerated. Second, the institutional environment, defined both by the availability of financial resources and appropriate working conditions, must enable knowledge workers to undertake one of their core functions, namely research. Should such an environment not prevail, the systemic incentives are unlikely to be sufficient to retain a quality cadre of academics and researchers. Both elements need to be disaggregated and require further clarification.

Three sets of reforms in remuneration are urgently required. First, the remuneration scales of the academy as a whole have to be significantly raised. Academic salary scales have fallen in relative terms for over two decades. A study that attempts to estimate the real purchasing power of academic salaries between six Commonwealth countries puts South African academic salaries slightly ahead of those in Malaysia, and behind those of the United Kingdom, Canada, Australia and New Zealand (Kubler and Roberts 2005). They have declined even more steeply in relation to other South African professional salary scales. A SAUVCA report notes that 'it has been evident for a long time that academic salaries are not comparable to private sector salaries and ... have been increasing at a slower rate than salaries offered to professionals in other fields' (SAUVCA 2004). It is common to hear of situations where a Masters graduate with no substantial working experience is immediately employed as a deputy director in the public service, and at the bottom of that scale earns a remuneration package equivalent to that of a professor with 20 years experience. The effect of such situations is that the academy has become unattractive as a career option. Not only has this resulted in top graduates shying away from research in the academy as a career, but it has also resulted in the senior researchers and established scientists who are required for the reproduction of a new generation of scholars engaging extensively in commissioned research and consultancy to augment their inadequate salaries (Kraak cited in Department of Science and Technology and Department of Education 2005). University managements have ensured that their salaries are market related, without concomitant attention being paid to the salaries of established scientists.⁴ Unless this is urgently addressed, research productivity is likely to continue to decline.

However, an overall increase in academic salaries is not in itself going to address the problem. This is because sufficient resources are not available to lift these remuneration scales to levels equivalent to those of two decades ago. This then raises the issue of differential remuneration within the academy. The South African academy, based as it is on the British system, has for long been defined by relatively standardised and egalitarian patterns of remuneration within the different research hierarchies. But this comes at the cost of the more productive researchers who are not monetarily rewarded to any great degree for their hard work and prolific output. For a system wanting to retain good researchers and encourage further output, is it not mandatory that remuneration be tied to productivity?

There are precedents for this. In the American academy, senior professors are able to negotiate their salaries on an individual basis, which leads to a system that is more unequal but more productive. There are also South African precedents. Two of the more notable cases in recent years have been the Human Sciences Research Council (HSRC) and the University of KwaZulu-Natal. In the former case, a new HSRC management attracted social scientists of quality by offering higher salaries than those offered by the universities. The result was that the institution's productivity, as measured by peer reviewed journal publications, jumped from 0.18 per researcher in 1997 to 0.8 units per researcher in 2004, or 0.67 adjusted for multiple authorship (Human Sciences Research Council 2005:5, 9; Orkin 2005). In the case of the University of KwaZulu-Natal, a different reward system tied to academics' research codes was implemented in 2002. As a result the productivity of the University of Natal component of the now-merged institution jumped from 448 to 582 SAPSE units between 2001 and 2003 (University of KwaZulu-Natal 2004). These examples suggest that the research outputs of institutions can be dramatically improved when research productivity is rewarded monetarily.

But is increased remuneration for productive researchers affordable? Studies indicate that globally the distribution of scientific production is not a normal one. As Huber reminds us:

... the distribution of productivity does not follow the normal (ie, bell curve) distribution, but rather follows the exponential distribution. Thus, most authors produce at the lowest rate and very few authors produce at the higher rates. (Huber 2001:1089)

This means that in any given field in a given period 60 per cent of researchers will have one publication, 15 per cent two, 7 per cent three and so on

(Huber 2001). Thus, if remuneration is tied to productivity, it is likely to reward small numbers of researchers within the academy, thereby making it more affordable. Moreover, while more resources would be directed to a limited pool of researchers, it nevertheless would have systemic effects by encouraging others, including younger researchers, to become more productive. The consequence is likely to be a greater aggregate output from the nation's knowledge system.

Finally, a transformation in the architecture of the academy's remuneration scales is warranted. Presently, these scales are structured to reward managerial more than core research and teaching positions, as recent revelations on the salary scales of some top managers have shown (Macfarlane 2004). This sends a message within the academy that should people want to earn more, they need to consider moving to managerial positions in academic institutions. A dynamic has therefore been created within the South African academy where productive researchers, black and white, tend to move into management because that is where monetary rewards are located. Not only does this undermine the retention of high calibre senior black academics within research and teaching, but it also prejudices research productivity. The result for a country like South Africa is catastrophic. It becomes almost impossible to make adequate progress towards the establishment of a demographically representative academy.⁵ And, the nation's research output falls with serious consequences not only for its intellectual reputation, but also for economic growth and development.

However, reform of the academy's remuneration system is, on its own, unlikely to enhance research productivity. Working conditions also have to be structured appropriately if a vibrant research culture is to emerge. Studies have indicated that South Africa's academic workplace has become more onerous and stressful in the last decade. In one such study, Eddie Webster and Sarah Mosoetsa demonstrated both that academics have to teach and mark more, and also that a more commercial managerial logic in the universities has produced demoralisation, greater stress, and less productivity (Webster and Mosoetsa 2002). This inevitably leads to the conclusion that working conditions in the academy have to be radically reformed if research output is to be increased.

Of course this must not be interpreted to mean that teaching and marking, and in general educating a new generation of high-level workers, are not important. Indeed these functions are crucial to the development, stability,

and future prosperity of the nation. But if the demand to educate a new generation is to be coupled with generating greater research output, then the institutional environment has to be one that is more empowering of researchers and research activities. Not only would this involve more academics being employed with a resultant decrease in staff-student ratios, but there also needs to be more support for marking and other teaching functions (Webster and Mosoetsa 2002). Again, lessons can be learnt from other experiences including those of the American academy. The net effect of these reforms would be expenditure of greater resources on the university system both from the public purse, and through a more entrepreneurial approach from higher education managers.

Better remuneration, and more enabling working conditions are indispensable requirements for a productive knowledge system. Without these, the top end of the graduate pool is unlikely to be attracted to research in the academy as a profession. Moreover, the academy would for the foreseeable future haemorrhage its most capable researchers, especially in an environment where there are shortages of skills in many areas. If South Africa's political elites are serious about enhancing the country's research productivity, and if they understand this as necessary for realising greater growth and development, then they must seriously consider the reforms associated with academic remuneration and working conditions detailed above.

Equity and excellence

The search for equity is a key theme in contemporary South Africa. Equity has many dimensions, in South Africa the most sensitive being that of race. Arguments for racial equity saturate the universities and research councils as well, posing interesting and difficult problems, amongst them that of maintaining institutions' research profile.

It should be noted that two separate discourses – that of racial empowerment and research quality – are in play in the debate on the transformation of South Africa's knowledge system. Before exploring the contours of this debate, it is worthwhile stating at the outset that excellence in research has nothing to do with race. Moreover, the redress imperative as defined in the constitution and legislation is explicit that the search for racial equity should not be at the expense of quality. However, the real world is not as neat as that of theory, and in fact as a result of the racialised legacy there is a real tension between the two imperatives. While the emphasis has

tended to change in key documents from equity to quality and efficiency (Cloete in Cloete et al 2005), there are strong, even increasing, pressures towards racial redress in the higher education and research system, now articulated more in terms of black empowerment than in terms of an egalitarian ethic. The challenge currently confronting leaders and managers of South Africa's higher education and research institutions is to manage the tension and effect an advance towards a more racially representative knowledge system without irreparably damaging its research productivity.

Excellence in research also has nothing to do with democracy, except in the sense that democratic policies that widen access to education and information increase the population from which talented researchers will emerge, and that democratic environments are more likely to assure researchers the tolerance they require to flourish, especially in the social sciences. Research however depends on merit, not representivity. Merit in research is composed of various things, including intelligence and imagination, and also experience and judgement. The excellent researcher will evolve over time: however intelligent they may be, researchers are unlikely to be at their peak immediately after being awarded their PhD. Meritorious research does not, however, imply one specific approach. It can involve the use of differing evidence, methodologies, judgements and conclusions, even when it pertains to similar areas.

If these propositions are accepted, some worrying issues arise in the context of contemporary approaches to research equity in South Africa. The institutional and personal profile of research in South Africa, and no doubt the intellectual orientation of many researchers, was and is deeply marked by racial origins and social class, though this is not necessarily directly reflected in the academic approach of all researchers from such backgrounds. From this environment, for good or ill, comes the country's particular contemporary research profile, with, as has been noted earlier, a preponderance of white, male – and now ageing – academics and researchers. This situation cannot be rapidly reversed, since education evolves gradually, higher education particularly so. This research structure can be dismantled, and it can be incrementally modified, especially through the mechanisms outlined in the previous section, but it is not possible immediately to replace it with an alternative, equally robust research system.

If these are the lineaments of research in South Africa, how do they relate to the current situation in universities and research councils? There is pressure to achieve a more balanced racial profile amongst researchers as

rapidly as possible. Quantitative targets have been set which departments and faculties struggle to meet. The retirement of researchers has often been encouraged, and sometimes enforced. Almost all universities shifted their retirement ages from 65 to 60 in the last decade in the hope of creating space for a more representative demographic profile.⁶ Staffing gaps are often not filled, and are left vacant because no suitable black candidate can be found. Premature promotions are common, leading to a lowering of the status of academic titles such as Professor and Associate Professor. Those talented and highly qualified black researchers who are available find themselves courted from all sides, and in addition, as noted above, often have well-rewarded options, which many exercise, outside the research world. In short, as Jonathan Jansen argues in a speech that spares no aspect of South African higher education, ‘the university ceases to exist when it represents nothing other than an empty shell of racial representivity at the cost of academic substance and intellectual imagination’ (Jansen 2004).

There are various dangers in this situation. It could be said that with the passage of time a type of normality will establish itself. Larger numbers of black researchers will be produced, and the pressures to appoint black candidates at all costs will ease. Ultimately, there will be an approximately normal distribution of the races in research as in other jobs, and the need for affirmative action will fall away.

However, this perspective is too long to be truly helpful. The contribution of research is vital in so many spheres, and the possibility of falling behind world developments so great, that South Africa cannot wait for the problem to resolve itself over time. There is a real danger that South Africa could casually marginalise its existing research talent while not being in a position to replace it. And while it can and does draw on the talents of other countries, especially African countries (incidentally to the peril of the research infrastructure of these neighbours), South Africa is not in a position to import and pay for such talent on a large scale, as is, for example, the United States (Kahn et al 2004).

There is, therefore, an uneasy balance between equity and excellence in contemporary South African research. It is crucial that the country gets this balance right. It will not help the cause of equity in the long run if the research effort is so badly damaged that it enters a downward spiral. It is particularly important to maintain existing expertise both for its own sake and for the sake of the training and support that it enables for the upcoming generation of

researchers. A parallel situation was that of the school teaching force in the mid-1990s, when experienced and well-qualified teachers were offered the chance, which many took, to retire on favourable terms from the teaching force, to the lasting damage of the school system and the interests of pupils (see, for instance, Fiske and Ladd 2004:106). A similar danger exists in this case.

Institutional collaboration

It is generally agreed, and the conference emphasised, that in modern conditions in many crucial spheres of research, collaboration in substantial focussed groups is essential. It is unlikely that such groups can always be constituted from within a single institution. In many cases, they will have to transcend institutional boundaries. This then brings us to the many forms collaboration can take. It can consist of networks that evolve purely from the logic of a particular research enterprise, without necessarily being predicated on the formal alignment of institutions. In other cases, however, institutional collaboration is important in facilitating research and making best use of the expertise and facilities available nationally, regionally and even internationally.

In South Africa, some barriers to institutional collaboration have in recent years been partially eliminated. The mergers and realignments of institutions of higher education of the past few years have begun to clear away some obstacles to such collaboration, in research as in other areas. Though undoubtedly the fundamental motivating factor in the mergers was an attempt to reduce costs, they cut through the racial categorisations that had previously divided the sector, and began to clear away this pernicious legacy of educational apartheid (Habib and Parekh 2000; Gibbon et al 2001).

Nevertheless, despite the many positive outcomes, the process of merging and realignment was a difficult one in many ways, and its repercussions are still being felt (Jansen (ed) 2003; Hall et al 2004). Third-level institutions are complex entities, and the shocks that they received in the course of institutional realignment have often left them reeling, at least for the moment. The introspection and scrambling for certainty in an uncertain environment that they have experienced and continue to experience tends to divert attention from various core activities, research included. Also, with their internal bureaucratic and academic structures still unsettled, they often find it correspondingly difficult to embark successfully on programmes of research collaboration with external partners, even fellow-universities.

This tendency for introspection and self-absorption is also a reason, it would seem, for the low level of collaboration between universities and science councils. However, there are other reasons as well. While the move towards financial self-reliance and cost recovery is near-universal in the contemporary academic world, it is particularly marked in the science councils, where subventions from their home ministries remain static or increase very little, and where they are required to raise ever-greater proportions of their revenue from research entrepreneurship. This in turn means that the councils can afford to devote little if any of their employees' time to research activities that do not earn substantial revenue. This economic model, while it does not rule out collaboration with universities, does make it difficult. It puts a premium on rapid results, on adequate as opposed to excellent research, and on a breadth of area sometimes amounting to dilettantism as opposed to rigorous investigation and specialisation. Also, as researchers' time is rigidly costed, it makes it virtually impossible to create space for a mentoring relationship with the postgraduate students who are at the heart of university research.

Institutional collaboration goes beyond national boundaries. South Africa stands at an intersection. On the one hand it is a substantial regional and perhaps continental power, whose weight is felt, in research as in other spheres, far into Africa. On the other hand, it is, in relation to the economically highly developed societies of the 'north', relatively insignificant and vulnerable, producing a small and declining proportion of the world's research output: as a 2004 CHE report aptly commented, 'South Africa has the best developed and capacitated national research and innovation system on the African continent, although its standing in the wider international research array has weakened' (Council on Higher Education 2004:124). This wider world is often seen as 'globalised', with the implication that it has entered a completely new stage. Though this may not be as unprecedented as is often implied, research in South Africa has to operate in a context where knowledge is fluid and instantly communicable yet also subject to power relations that tend to benefit those most able to utilise the immense power and sweep of contemporary technology.

The conference spoke of collaborating with the rest of Africa towards the development of the continent, and of South Africa's 'vanguard role'. For such aspirations to make sense, there should be a realistic assessment of the regional and continental situation. While there are islands of excellence, in general, universities over most of sub-Saharan Africa are grossly under-

resourced and out of touch with the latest research. Academics are usually paid extremely low salaries, and many of the best African academics and researchers leave their home institutions for appointments abroad, some coming to South Africa. Most research work done at African universities is carried out for consultancies, to earn a living for the researcher, with all the limitations of this genre. Sometimes academics spend much of their time working at occupations and on projects without any research content at all. As in South Africa but even more disproportionately, managers of academic institutions are paid more and have more prestige than academics and researchers (see, for example, Lebeau and Ogunsanya 2000).

What might institutional collaboration mean in these domestic, regional and international contexts? In all of them, resources are crucial, but the question takes different forms in the three environments. In South Africa itself, the declining rate of state support, particularly in the science councils but also in the universities, tends to move research in directions required by the remaining funders such as domestic or international donors, or industry and commerce. Research funding has never been a neutral or a simple process, and the argument here is not that there is always and in every case an automatic correspondence between the public interest and the state. However, it can be argued that the state's partial retreat from direct funding of research, particularly in the science councils whose remit is applied science, has tended to limit the available options and has opened the way for research agendas not always or primarily aligned to the interests of the South African public. Collaboration between research bodies is to be encouraged: it enables large projects to be undertaken, makes good use of skilled researchers and saves in personnel and other costs. However, it is more questionable if it masks the decline in state support and provides a channel for the elaboration of research agendas over which South Africans have little control.

The question of resources applies even more starkly to the question of collaboration between South African and regional and continental researchers. Here, it is South Africa that wields the power. With generally a very limited research base, it is difficult for African research organisations to negotiate on a level of equality, and the tendency is for South African researchers (like South African business) to be able to dictate the terms of the relationship. South Africans should be aware of this, and try to ensure that the research relationship, in spite of political and economic realities, is as even-handed as possible. This is an essentially and perhaps

unsatisfactorily moral and ideological approach, but it is difficult to see what else is possible in the circumstances. In terms of facing the ‘globalised’ world, the situation is reversed, and South Africa, in research terms, tends not to hold the trump cards. However, in some research areas this may not be the case. South Africa thus needs a clear research focus, and a keen appreciation of what it can and cannot do, and where its comparative advantages lie. South African researchers are in a better position to enter collaborative international agreements on a basis of approximate equality than are other African research communities, and they need to rapidly, though prudently, develop collaborative international networks of this kind. To do this, however, the level of support in South Africa itself will need to be maintained and increased.

Management of higher education and research

Many of the issues that we raise come into sharp focus when the management of higher education and research is considered, because this is the point of delivery. Questions of academic remuneration referred to above affect the management of research. Glaring inequalities between the remuneration of researchers and administrators demotivate researchers and sap their productivity. The South African system to some extent rewards researchers financially for success in their fields, though this varies from institution to institution. However, these rewards are inconsiderable, and the way to advance in the system is in essence not to succeed in it, but rather to leave its crucial, research, aspect. This is not a recipe for a vibrant research sector.

Management of South African higher education and research is problematic.⁷ The shocks and adjustments that have affected the whole of the society have not spared universities and other research institutions. However even within a system that appears to be undergoing substantial change there are also forces of inertia and conservatism that influence, not always for the best, how research is managed. Instability and conservatism sometimes unite in a malign combination.

Policies of empowerment can have unexpected results in the context of universities and research councils. Programmes, faculties and departments aim to balance their racial and gender composition, which normally means appointing more black candidates. Though policies in this area make it clear that this process is intended to work in conjunction with the maintenance of quality, in fact targets tend to be interpreted in terms of a crude racial headcount. This has a number of effects, given the historical realities of

educational privilege. One is that posts can go unfilled for lengthy periods for want of any adequate black candidates. Another is that there tends to be an influx of young and inexperienced black academics, which leads to the unfortunate situation, with many possibilities for misunderstanding and conflict, of a cohort of older mainly white academics in authority over young and mainly black junior colleagues.

In forming the new merged third-level institutions the posts of vice-chancellor were publicly advertised, though of course at this level there are many influences at play in such appointments. However the practice with second-tier management has in general been to allocate positions to the personnel of the old institutions with an eye to the careful division of posts rather than to the creation of dynamic and innovative research administrations. These processes have various effects. Firstly, the quality of management is deficient. Research managers, it is generally agreed, ought to have a thorough knowledge of the world of research. Yet top managers frequently have very few academic publications. A few have (or, where no longer in office, have had) none. Given that peer-reviewed publication is, rightly, the touchstone of academic competence and achievement, particularly in the field of research this is a worrying tendency. Arguably, opportunities were missed during the merger process to look carefully and critically at research administration in its totality.

There appears also to be little sense of history or context. The ubiquitous strategic visions that are intended to guide institutions tend to be much the same, from wherever they emanate, uttering the same ambitious but decontextualised and unspecific mantras of quality, relevance and the like (Habib 2001). They pay little attention to the generally difficult historical legacies and current problems of South Africa's varied and unequal higher educational, and therefore research, environment. Without greater clarity of vision, it is difficult to believe that mergers of institutions will in themselves resolve these questions.

At the centre of the academic system are deans. Always powerful, their bureaucratic position has in one sense been strengthened in recent years by the tendency to appoint 'executive deans' who are line managers directly answerable to the vice-chancellor. Previously, faculty members elected deans who are, or were, more directly responsible, and therefore generally responsive, to the academic community.

Yet the way in which the power of deans has tended at present to express itself has been through an elaboration of and concentration on administrative

processes rather than on critical engagement with research and teaching. Thus formal power does not always go with the real power, for example, to influence and help to mould research and create imaginative research agendas. Academic systems have become more bureaucratic, even authoritarian, yet also less responsive and nuanced in their approach to the core responsibilities of higher education institutions. To what extent this is a structural issue, with academic and research influence perhaps inevitably seeping away in a welter of meetings and form-filling, and to what extent it is a product of the appointment of often inadequate deans, servants of central administrations that increasingly engross power without always being able to exercise it in creative ways, is difficult to determine. The effect, at any rate, is that, typically, deans do not play their expected role in high-level strategic decision-making and management.

A further weakness in academic management is the council system that is meant to oversee the activities of universities and research councils, including their research. In many cases, councils have frittered away their time either on micro-management and partisan involvement in the quarrels that tend to afflict academic life, or have hung back from decisive action on gross mismanagement. Of twelve councils surveyed in a Council on Higher Education report in 2002, half had serious problems, and of these three ‘were either deadlocked by endemic crises ... or have collapsed as a result of such crises’ (Hall et al 2002:75; Habib 2001). In an attempt to preclude immersion in these institutional politics, the Higher Education Act of 1997 laid down that 60 per cent of council members now have to be from outside the institution. However, vice-chancellors nominate potential council members to the Department of Education, and this tends to lead to councils packed with their allies, a situation that makes real oversight impossible.

In short, the research system has emerged from, and still bears the marks of, deliberately imposed inequality. Though it is difficult to generalise about the quality of research management, which differs from institution to institution, large swathes of the system are badly administered. The ‘managerialism’ said to characterise the sector should not necessarily be taken as implying bureaucratic efficiency in a context where high-level bureaucratic and administrative skills are at a premium.

Conclusion

South Africa in the 1980s was characterised by isolation. There was the basic fact of politico-geographical isolation. The electronic revolution that has

in some senses eroded the isolation of particular societies was still in its infancy as a mass phenomenon. South Africa was at the southern extremity of a poor and scientifically underdeveloped continent with which it was tacitly or overtly at war, yet with its ostensible loyalties to the western world and the western values that it claimed to represent reciprocated only in part, contingently, and with many reservations.

There was also the more subtle isolation engendered by the harsh and intractable issues that characterised South African society and politics. A country that had once, albeit in the context of colonialism, been linked in many ways to the rest of Africa, found itself isolated from the continent as a whole, or joined only in the tense embrace of mutual hostility. This engendered introspection and parochialism, in research as in many other fields. This was not confined to the then establishment. Even the academic left paid remarkably little attention to Africa north of South Africa. History, sociology and other disciplines focussed almost entirely on South Africa itself, and whole historiographical and other intellectual movements in Africa in the forty or so years from the mid-twentieth century largely passed South Africa by (Mamdani 1996). The intellectual scene was set by an intolerant and racist orthodoxy, and even the radical and liberal players, protest as they might, had to perform on this stage.

It is therefore ironical that contemporary South Africa, open to and engaged with the world, is, in research terms, less productive than the isolated and provincial country of the apartheid era. This is not a trivial question: the well being of the society is bound up with the ability to face and solve the questions that challenge it. A robust, well-supported, critical research system is the lynchpin of this process. The June 2005 DST conference was perhaps a hopeful beginning in that it indicated problems and began to suggest ways of confronting them. However, the real challenge lies in facing up squarely to the many difficult and sometimes controversial issues that this confrontation will involve.

Appendix

1. Education Training and Employment

In meeting the goal of 1 per cent of GDP expenditure on R&D by 2008, the focus should be on the recruitment and retention of research masters, doctoral and post- doctoral fellows to create a more flexible and responsive workforce able to achieve mastery of new domains of technology. This new resource will require a strong and motivated academic research workforce, able to achieve larger research groups and global leadership in key domains. This will be facilitated by improved incentives for research

intensive careers, good research facilities and performance related remuneration and measures to enhance the capacity of institutions to manage research and post-graduate training for maximum value.

Promote the collaboration and the development of partnerships between universities, and between higher education, science councils and industry, to maximize overall institutional research development capabilities to achieve a critical mass of researchers across institutions and to support the national R&D agenda. This collaboration will take account of institutional focus in niche areas of strength and capability.

2. Knowledge Production for the SA Economy

Ensure that knowledge production is optimized by focused attention to more strategic development of PhD graduates including the optimizing, funding and managing of the environment in which students operate, such as explicit development of research skills, development of better supervisor support and more appropriate funding for full-time students. This drive will be strengthened by ‘re-imagining the PhD’ by for example, completion by publication and synthesis in contrast to the traditional thesis approach.

Establish larger groups focusing on more relevant research questions and themes that are linked to a high potential for future employment and long-term research career planning. Ensure the maximum participation of productive academics by providing new and additional mechanisms, such as research chairs, specialized units and centres of excellence.

Ensure that the research environment incentivises both publication of a high standard in recognized journals as well as the protection of intellectual property arising from publicly financed research to enhance innovation and entrepreneurship.

3. Improving Public Research Infrastructure

Ensure that prioritisation of R&D is informed by national goals and imperatives. Planning over the span of the budget framework will take into account key infrastructure needs and the associated human capital investment plans. This will be achieved through, for example, the ring-fencing of the allocation of funds for the strengthening of the research equipment base. The increase of R&D to 1 per cent of GDP should focus on increasing the number of productive young researchers, increasing PhD production, increasing the focus and size of research groups and the development of academic careers in well-found [sic] laboratories and national research facilities.

4. Enhancing Research Funding

Ensure that a more productive and economically effective workforce is achieved by quality investment in R&D. Ensure that public investment in focused areas leads to the attraction of high quality foreign direct investment and research being relocated to the country resulting in the development of more effective interfaces between private and public research.

Develop novel means, such as giving attention to the structure of BEE and government procurement systems to leverage research and innovation. Further development of international financing and selected public private partnerships should remain a priority.

5. *S&T and the African Experience*

Secure the most rapid and sustainable development of the continent and the improvement of the quality of life of its people through political leadership at the highest level in order to prioritise the mainstreaming of science and technology through the AU, NEPAD and multilateral programmes.

South Africa will develop a vanguard role in African science and technology including the development of specialised funding instruments that facilitate partnerships with African institutions and researchers.

Existing universities, public research institutes and Academies will prioritise cooperation and networks for human resource development, making effective use of current initiatives to strengthen science in Africa, including the G8 deliberations and the Commission for Africa.

6. *Globalisation of Research*

Establish carefully planned and concerted measures to ensure a net inward flow of high-quality researchers ('sticky mobility'). This will include a major open post-doctoral fellowship scheme, 'sandwiched' doctoral bursaries, and active 'hubs' to provide competitive local research opportunities, including centres of excellence as the primary gateways for international collaboration and partnership.

Establish an urgent and appropriately resourced programme to enhance e-Research resources for all South African researchers, especially open access to the current high-impact literature.

Notes

1. This figure has increased to 0.8 per cent of GDP amounting to R10.1 billion being spent on R&D in the 2003/2004 financial year. Just over half of this was spent in the business sector, while 22 per cent and 21 per cent was directed to the higher education sector and science councils respectively.
2. Studies indicate that there is a strong correlation between research, innovation, and economic development and prosperity (Mouton et al 2002).
3. India, of course, is seen as a success story because of its economic growth and especially the development of its information technology sector which is integrated into and has successfully competed amongst the corporations of the developed world.
4. Indeed, many believe that university management salary scales are too generous. There was an outcry when the *Mail & Guardian* published the salary packages of the country's vice-chancellors. See Macfarlane 2004.
5. There is plentiful anecdotal evidence for this. For example, one of the authors asked a well-known black academic manager, a mathematician by training, why s/he left his/her field of training within 24 months of obtaining a PhD, even though s/he had clearly demonstrated potential to become a significant researcher. The response was that monetary pressures were too intense, and the quickest way to

relieve this was to earn a decent wage, only available, within the academy, in management positions.

6. This is apparent from university websites. See, for example, the University of the Witwatersrand, <http://www.wits.ac.za/vacancies/condperm.htm>
7. Jansen notes that leadership is the single most crucial variable determining the success or failure of mergers, yet that sufficient attention has not been given to this aspect in the far-reaching restructuring of South African higher education (Jansen et al 2003).

References

- Cloete, N, 'Equity and development in post-apartheid South African higher education', in N Cloete, P Pillay, S Badat and T Moja (2005) *National Policy and a Regional Response in South African Higher Education*. Oxford and Cape Town: James Currey and David Philip.
- Council on Higher Education (2004) *South African Higher Education in the First Decade of Democracy*. Pretoria: CHE.
- Department of Science and Technology and Department of Education (2005) *Human Resources for Knowledge Production in South Africa: papers*. np: DST.
- Erwin, A, MMangena and TMbeki (2005) unpublished paper, 'The challenges facing higher education in South Africa', final draft 1 June, 2005.
- Fiske, EB and HF Ladd (2004) *Elusive Equity: education reform in post-apartheid South Africa*. Cape Town: HSRC Press.
- Gibbon, P, A Parekh, J Jansen and A Habib (2001) 'Accounting for change: the micropolitics of university restructuring. Part 1, Balancing books and ideas'; 'Accounting for change: the micropolitics of university restructuring. Part 2: Changing structures, contesting identities', *South African Journal of Higher Education* 15(1) and (3).
- Government of the Republic of South Africa (2002) *South Africa's National Research and Development Strategy*. Pretoria: Government Printer.
- Habib, A (2001) 'Structural constraints, managerial ineptitude, and stakeholder complicity: a study of the institutional crisis of the University of the Transkei', *Politikon* 28(2).
- Habib A and A Parekh (2000) 'Transforming South Africa's university system: the case for strategic mergers', *Perspectives in Education* 18(3).
- Hall, M, A Symes and T Luescher (2004) *The Governance of Merger in South African Higher Education: research report prepared for the Council on Higher Education*. Pretoria: Council on Higher Education.
- Huber, JC (2001) 'A new method for analyzing scientific productivity', *Journal of the American Society for Information Science and Technology* 52(13).

- Human Sciences Research Council (2005) *Annual Report 2004-2005*. Pretoria: HSRC.
- Jansen, JD (2004) 'When does a university cease to exist?' 40th Hoernlé Memorial Lecture, South African Institute of Race Relations, Braamfontein.
- Jansen, JD (ed) with N Bandi, S Chalufu, M Sehoole and V Soobrayan (2003) *Mergers in Higher Education: lessons learned in transitional contexts*. Pretoria: UNISA Press.
- Kahn, M and W Blankley (2005) 'The state of research and experimental development: moving to a higher gear', in S Buhlungu, J Daniel, R Southall and J Lutchman (eds) *State of the Nation: South Africa 2005-2006*. Cape Town: HSRC Press.
- Kahn, M, W Blankley, R Maharajh, TE Pogue, V Reddy, G Cele and M du Toit (2004) *Flight of the Flamingos: a study on the mobility of R&D workers*. Cape Town: HSRC Press.
- Kubler, J and L Roberts (2005) *Association of Commonwealth Universities 2004-05 Academics Staff Salary Survey*, Association of Commonwealth Universities, <http://www.acu.ac.uk/policyandresearch/chemsurveys/1106913384.pdf>. Accessed 29 October, 2005.
- Lebeau, Y and M Ogunsanya (eds) (2000) *The Dilemma of Post-Colonial Universities: elite formation and the restructuring of higher education in sub-Saharan Africa*. Ibadan: IFRA/African BookBuilders.
- Macfarlane, D (2004) 'Who's the fattest cat?', *Mail & Guardian Online*, 14 December. http://www.mg.co.za/articledirect.aspx?area=mg_flat&articleid=193598. Accessed 28 October, 2005.
- Mamdani, M (1996) *Citizen and Subject: contemporary Africa and the legacy of late colonialism*. Princeton NJ: Princeton University Press.
- Mouton, J, SC Boshoff and TG Bailey (2002) *The Promotion of S&T Capacity in South Africa. A report commissioned by the Academy of Science of South Africa*. Stellenbosch: Centre for Research on Science and Technology.
- Orkin, M (2005) 'Presentation to HSRC Staff'. Speech to HSRC 9 June, 2005.
- Pouris, A (2003) 'South Africa's research publication record. The last ten years', *South African Journal of Science* 99.
- SAUVCA (2004) *Academic Labour Markets and Salaries in South Africa*. Pretoria: SAUVCA.
- University of KwaZulu-Natal (2004) unpublished document, '2001-2004 Ex Natal and Ex UDW final DoE SAPSE Jnls'.
- Webster, E and S Mosoetsa (2002) 'At the chalk face: managerialism and the changing academic workplace 1995-2001', *Transformation* 48.