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THE ROLE OF TECHNICIANS IN TEACHING AND RESEARCH

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Technical personnel are an important human resource in any institution, and especially so in teaching and research institutions. The success and productivity of teaching and research institutions depends, to a large extent, on the support that academics or researchers get from the technical cadre. It is for this reason that technicians should be properly trained, skilled, well informed, up to date and dedicated to their profession.

This paper discusses the role of technicians in teaching and research institutions and the need for regular appropriate and effective in-service training.

Science and Technology (S&T) are powerful forces that shape the social and economic progress of any nation and hence its development. A nation is classified as "developed" , "developing" or "underdeveloped" depending, to a large extent, on its level of S&T. But, the fact is that S&T needs some practitioners, and "technicians" play a crucial part in supporting these practitioners.

Teaching institutions cover materials in different disciplines and at different levels. These institutions include primary, secondary and tertiary level ones like universities, polytechnics (or technikons/ technical colleges). This paper will discuss the role of technicians at universities, taking the University of Botswana as a typical example.

A typical tertiary teaching institution has a Faculty of Science where various disciplines are covered. At the University of Botswana, the Faculty of Science has eight academic departments:

- **Biological Sciences**
- **Chemistry**
- **Computer Science**
- **Environmental Sciences**
- **Geology**
- **Mathematics**
- **Physics**
- **Pre-Entry Science (PESC)**

Some of the other institutions may have departments such as Biochemistry, Pharmacy, Astronomy, Oceanography as well as Faculties of engineering and medicine which also require services of technicians.

Each of the disciplines mentioned above has associated laboratories which are equipped with modern instruments whose operation, maintenance and service need skilled technicians. Some typical instruments or equipment found in such laboratories are summarised in table 1 (see page 3).

In addition to these departments, there is a Faculty of Science workshop and the Okavango Research Centre (ORC). The Faculty of Science workshop has the function of repair, design and development of

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THE SECRET LIVES OF AFRICAN WHYDAHS

Dr. Phoebe Barnard

Whydahs (*Vidua*) are a group of small, beautifully ornamented African finches. Like cuckoos and honeyguides, they are brood parasites: they do not raise their own young, but get a foster species to do the work for them. As a result, they have no apparent need to maintain long-term pair bonds between a mated pair. They are promiscuous and may have 16 or more copulation partners in a single breeding season.

This promiscuity does not seem a very admirable life-style in our HIV era, although the combination of promiscuity and brood parasitism has undeniably meant that both sexes can breed very rapidly. Indeed, like many promiscuous species, whydahs probably do suffer from sexually transmitted diseases. Diseases may have even driven the evolution of the fancy plumage and tail ornaments of whydah males, in the sense that a glossy and healthy-looking plumage may effectively "advertise" disease-free status to prospective mates. While this is certainly an esoteric subject, especially in the context of African needs and priorities, it has been an extremely active and productive field in northern universities because of the light it sheds on the evolution of behaviour and morphology. African birds, such as the long-tailed and Jackson's widows *Cuplectes progne* and *E. jacksoni*, the scarlet-tufted malachite sunbird *Nectarnia johnstoni*, and three of the whydahs, have featured very prominently in recent research on ornamental plumage and sexual selection.

Brood parasitic birds such as whydahs are perplexing creatures in many ways in evolutionary terms, their strategy of "freeloading" has been very successful. Many brood parasites, such as some of the New World cowbirds (*Icterinae*), have combined a generalised brood parasitism strategy (using a range of potential host species) with a behavioral flexibility that has allowed them to expand their range greatly. Brood parasites and their hosts can also make intriguing case studies in coevolution, as explored by some recent research projects on cuckoos in Africa and elsewhere.

There are between ten and fourteen species in the genus *Vidua*, of three general forms. These are the paradise whydah group, with long, broad tail ornaments (sometimes called subgenus *Steganura*); the whydahs with long, slender tail ornaments, such as the straw-tailed whydah of East Africa and the shaft-tailed whydah of southern Africa (subgenus *Tetraenura* or *Vidua*); and the glossy black, short-tailed indigobirds (subgenus *Hypochera*). Nearly all the whydahs and indigobirds are host-specific, and the chicks of these host-specific species mimic the gape patterns, behaviour and begging calls of the young waxbills. Adult males also mimic the species-specific sexual song of the host.

Whydahs and their congeners, the indigobirds, have provided countless intriguing puzzles for African ornithology. The systematics of this group of finches has not been well understood—at first, males and females were thought to be different species because of their strikingly different plumages in the breeding season. The indigobirds, which are all similar in appearance and differ mainly in song and bill and leg colour, have stymied ornithologists virtually to this day, and the difficult systematics of this group has only been resolved with any degree of sense by the careful work of Jurgen Nicolai and especially Robert Payne. It was also not realised until sometime in this century that whydahs were parasitic, and early naturalists looked in vain for their nests.

Research on whydahs has focused on mating systems, vocalizations, territoriality and sytematics. Robert Payne of the University of Michigan, the world expert on this genus, analysed the factors affecting mating success of male village indigobirds *Vidua chalybeata* in Zambian woodland, and found that males defend well-spaced, traditional song perches ("call-sites"). Females visit these call-sites, and only a few of the resident males succeed in mating with them. In his study, females chose mates mainly on their song output, and on the presence of nearby territorial males and defended resources.

Sexual behaviour and mating systems have also been the focus of work on the pin-tailed *Vidua macroura*, shaft-tailed *Vidua regia* and paradise whydahs *Vidua paradisaea*. The pin-tailed whydah is a generalized brood parasite of African grasslands and agricultural lands; it does not mimic the nestling gape pattern or song of its several hosts. By contrast, the shaft-tailed and paradise whydahs are specialist parasites of *Acacia* savanna, and they mimic the gape and song of their hosts, the violet-eared waxbill *Uraeginthus granatinus* and melba finch *Pytilia melba* respectively. The mating systems of these whydahs, like the village indigobird, are based on male defense of a traditional call-site. Defense of such a site appears to be needed for successful mating by males. Males which control these sites are constantly challenged by nonterritorial "satellite males", as well as by holders of poorer quality sites. If territorial males leave their call-sites temporarily to drink or inspect neighbouring sites, satellite males quickly seize the opportunity to sing from the song post. Despite their best efforts, though, they rarely if ever succeed in mating. Many satellite males acquire breeding plumage much later than territorial males, and this may reflect poor body condition and reduced fertility.

So what, other than control of a good territory, do females find appealing in males? Although an enormous pop magazine industry has been supported around this eternal question in human society,

PROLIFERATING ETHNIC CONFLICTS WILL REQUIRE CREATIVE WAYS TO REDUCE FRICTION AND VIOLENCE

With ethnic conflicts threatening the stability of more and more countries around the globe, policy makers and experts - including some from the world's worst trouble spots - met on 17-19 August 1994 to debate practical ways to accommodate diversity and avoid continued clashes.

The three day seminar on "Ethnic and Public Policies", held at the United Nations in New York, heard numerous case studies of developing and developed nations, explored competing claims of governments and ethnic minorities, and analysed various successful and unsuccessful policy prescriptions—from the Middle East to South Africa to Malaysia to Rwanda and Burundi.

A preliminary report is available from the seminar's organisers, the United Nations Research Institute for Social Development (UNRISD) and the United Nations Development Programme (UNDP). "There are two central points that must now be clear," said UNRISD Director Dharam Ghai in his closing remarks to the gathering. "First, ethnic conflict is a growing problem that will probably only get worse over the short and medium term. Second, no country in the world—no matter how rich and well-developed —is immune to its effects."

"Because of this," Ghai said, "the search for peaceful ways to accommodate ethnic diversity must generate practical policies that can be replicated by countries around the world, while at the same time we recognize that each situation is unique and requires further research and reflection."

Gus Edgren, Director of UNDP's Bureau for Programme Policy and Evaluation, noted there was health agreement that "ethnicity is not a pathology that must somehow be cured, but a normal condition that must be accommodated through effective government and sustainable human development."

Prof. Crawford Young, Chairman of the Department of Political Science at the University of Wisconsin and an expert on African countries contrasted what he called "demonic forces and angelic forces" that now competed on the world stage. On the negative side, he cited ethnic cleansers and ethnic assassins, the general capacity for escalation and dehumanization in ethnic conflicts, and the ability of ethnic "outbidders" or "entrepreneurs" to stir up racial, religious or tribal hatreds and mobilise them—even when ethnic differences *per se* have little or nothing to do with the situation on the ground."

Opposed to this, Young said, was the leadership factor—embodied in men like Nelson Mandela who can transcend historical patterns" —and majority governments that understand the larger concepts of tolerance and civic solidarity.

In terms of policy prescriptions, Young said the seminar participants clearly showed that changes in electoral systems required more research as effective ways of accommodating diversity and defusing conflict, particularly because this approach was more feasible than changing a constitution.

Young said other promising areas included the potential for changing cultural and educational policies, the argument that viable nation states "do not require a single language", and the ability of economic policies to work toward the well-being of all sectors of the population."

Among the prominent policy makers attending the seminar were Hanan Mikhail-Ashrawi, Commissioner General of the Palestinian Independent Commission for citizens' Rights; Prof. Nichal Haysom, Legal Adviser to President Mandela; and Valery Tishkov, former Minister of Nationalities in Russia.

The report from this conference will be one of UNRISD's most important contributions to the on-going Social Summit in Copenhagen.

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for whydahs it seems a relatively simple matter. Female whydahs in behavioural experiments solicited matings from males with artificially lengthened tail ornaments, so tail length seems to be an appealing trait. However, symmetry in the ornament does not seem very important to females, at least by contrast to its length. Symmetry might be important if, for example, the ability of a male to grow the expensive tail ornament "perfectly" (i.e. symmetrically) reflects his genetic quality or body condition. While the tails of whydahs, especially the paradise whydahs, are indeed extremely energetically costly to produce, females seem more impressed by overall size than symmetry. Male mating success is also related to the defense of perennial water resources, and with the interest shown in a male by other females! Male whydahs at isolated call-sites usually have low reproductive success and few visits by receptive females or rival males. If these isolated males are experimentally removed, their call-sites stand vacant longer than central sites. So attractive sites seem to be defined largely by the quality of defended resources (food and water) and by their central location.

Whydahs have an intriguing hidden life that awaits students of animal behaviour and evolutionary ecology. Lots of secrets remain to be gleaned by those with a flair for patient observation and experimental design.

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