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and this is the penultimate issue that I shall be responsible for. The Society and its activities have changed considerably during the period of my editorship – the Special Interest Groups (or at least some of them) have grown and flourished, the Postgraduate Forum has become established in the Society's calendar, Regional activities have increased and Entomology '97 happened! We mustn't however become complacent, I think we still need to ask ourselves, as a Society, whether we are providing the membership with what is most appropriate for the next millenium.

Take, for example, the Monthly Meetings – when I started attending these some 15 years ago the Meeting Room was always full to capacity (and we had buttered scones and buns for tea!!!). Indeed at one time I remember eyebrows being raised by the more senior Fellows when a mini-bus load of us arrived from Silwood Park, and seating was already scarce! Fifteen years on, unless the Monthly Meeting happens to coincide with the Verrall Supper, the Annual or an SIG Meeting, audiences of more than about 20 are becoming somewhat of a novelty. Why is this? Do the talks not attract? Does the effort involved in attending outweigh the benefit gained? Should the Society give serious thought to a change of plan? Should we aim for well-planned, well-advertised quarterly meetings with more than one speaker? Should we concentrate more on thematic issues? How can the Society attract more entomologists (particularly those starting their careers) to become more actively involved in the Society – and not just for reduced journal subscriptions? *Antenna* is an appropriate organ for the membership's views to be heard.

With this issue we also say goodbye to Frank Millington from Printing Administration Limited. Frank's role in ensuring the quarterly appearance of *Antenna* has been second to none. We will miss Frank's contribution very much and in thanking him for *all* his efforts we wish him a happy, but well-earned, retirement.

Articles

The Bushman as an Entomologist

STUART V. GREEN, *Natural Resources Institute, University of Greenwich, Chatham Maritime, Kent ME4 4TB.*
(e-mail: stuart.green@nri.org)

I imagine that most readers will be familiar with the Kalahari Bushman through the writings of Laurens van der Post, or from numerous television documentaries, or perhaps even through the well-worked body of anthropological literature relating to the !Kung of Dobe. To explode the myth somewhat, it is probably true to say that life for these indigenous peoples of the remote Kalahari has changed more during the relatively few decades since van der Post's first visit than throughout the preceding millenium. There should be no misconception, the tr
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There should be no misconception, the true, semi-nomadic hunter-gatherer lifestyle is no longer practised. This is partly because, for several reasons, that way of life is no longer fully viable, but also because nowadays the understated hardships of that existence are no longer unavoidable.

In the Nyae Nyae area of Eastern Bushmanland, Namibia, where I was fortunate enough to spend some seven months living in close proximity to the Ju/'hoansi Bushmen during 1993-94, people are now settled in villages with permanent water from boreholes. Radiocassettes, training shoes and Coca-Cola are now widespread, as are venereal diseases and drunken disorderliness. But the essence of the hunter-gatherer way of life remains much apparent. A diminishing proportion of men still hunt using bow, poisoned arrow and spear (Namibian Law forbids them to use rifles), whilst throughout most of the year bush foods such as fruits, nuts, beans and berries, gathered predominantly by women, make a significant contribution to the overall diet.

Part of my reason for being in Nyae Nyae was to make an insect collection, concentrating in particular on the grasshoppers of this little-visited area of the western Kalahari. Having amassed several hundred specimens, I happened one day to show part of the collection to a pair of elderly Bushmen. Their reaction on lifting the lid was one of astonishment, nothing short of delight, and it soon became clear that they were very familiar with many of the insects before them. In fact they proceeded to pronounce the name of each for my benefit, and soon a small crowd had gathered, wide-eyed and curious, pointing, laughing and gesticulating. This experience demonstrated to me that the average Ju/'hoan was actually rather knowledgeable about insects. Subsequently I was able to follow this up further by staging a series of group interviews in villages, with the assistance of a translator, using the insect collection as a visual aid (Plate 1). The findings are summarised below.

The Utility of Insects

Like other indigenous peoples living in harsh environments, the Ju/'hoansi have found ways of exploiting what most Westerners would consider the most unlikely resources. Insects are today still utilised in a variety of ways, as food, poison, medicine and ornament, as well as playing a role in folklore.

Perhaps the most important insect resource, certainly so in times gone by, is the group of beetles whose larvae provided the lethal poison for hunting arrows (a single arrow wound will kill a large antelope). During the 1950s, Charles Koch (Transvaal Museum) was able to identify three chrysomelid species that were used for this purpose, by breeding the larvae through to adults. Today *Diamphidia nigroornata* and *Polyclada flexuosa* at least, remain widely used in the production of poison arrows. Prior to pupation, the larva remains in diapause for a prolonged period inside an earthen cocoon, buried 50-100cm below the sand surface beneath the host tree. Ju/'hoan hunters collect such cocoons, and even take measures to protect particular Marula trees known to produce large numbers of *Polyclada* cocoons, by building fire breaks around them during the dry season. The larva, known as *!oan/aqro*, is removed from the cocoon and squeezed tightly as its front end is applied to the shaft of the arrow behind

Plate 1. The author interviewing a group of Ju/'hoansi

the arrowhead (Plate 2). The exudate is smeared along the shaft and then baked dry over an open fire. Great care must be exercised throughout, since the poison is deadly to man and beast alike. Indeed, during my time at Nyae Nyae at least one Bushman died as a result of a poison arrow stab during a drunken fight. The hunter may produce 15-20 arrows in a single batch (Plate 3), and these last for up to three months before the potency of the poison declines. Several other species of beetle are sometimes also used as poison, and interestingly one of these species can also be prepared into a pain-relieving ointment.

Insects were also involved in medicine in other ways. During the healing dance, performed to cure the seriously ill, a traditional healer wears rattles tied below his knees, reminiscent of Morris dancers' bells. These consist of a series of 20 or so dried cocoons, *jo 'oro*, from a lasiocampid moth, strung together and filled with tiny pieces of gravel and fragments of ostrich egg shell. Such rattles were becoming something of a tourist item during my time at Nyae Nyae (I must confess that I bought a set myself, and have remained in good health ever since!), and consequently the cocoons have become a highly valued resource. Healing powers were also reported for the giant weevil, *g!oq'm*. This impressive beetle, *Brachycerus ornatus*, which is almost the size of an avocado stone and ornately dotted with red spots, was said to relieve a woman's stomach pains when it was worn as an ornament.

Although invertebrates cannot ever have been the mainstay of the Ju/'hoan diet, seasonally abundant insects such as winged termites, locusts and caterpillars were all eaten in large numbers in the past at least, and must have provided a significant nutri-

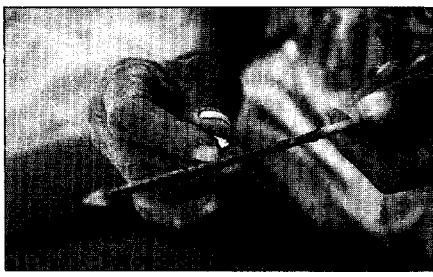

Plate 2. The larva is squeezed firmly as its anterior is applied to the arrow shaft

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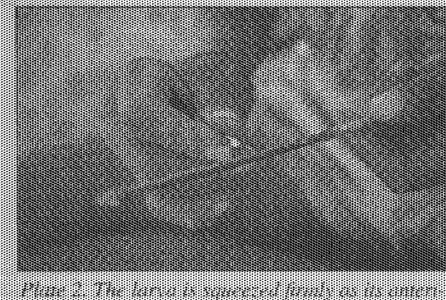

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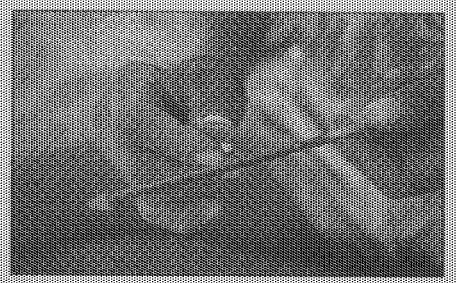

Plate 2. The larval is squeezed firmly at its anterior end to apply it to the arrow shaft.

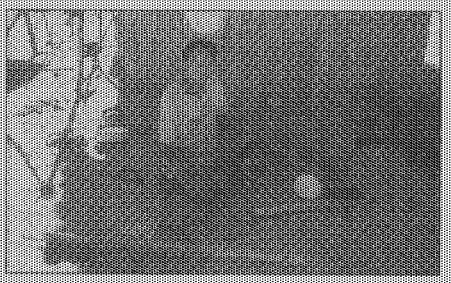

Plate 3. A hunter may produce up to 30 poisoned arrows in a single batch.

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Insect Names

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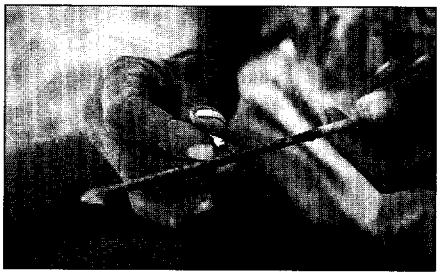

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Plate 3. A hunter may produce up to 20 poison arrows in a single batch

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Other Insect Highlights

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not harm a mantis for fear of having terrible dreams. Others said that the mantis brought imminent bad luck.

The annual emergence of various insects was widely used as a chronological indicator, and many insects took their names from events that coincided with the time of their appearance. A species of emperor moth was known as the "malaria moth", *dhadhama g/a!ae*, because it appears when people first start to go down with malaria in the rainy season. The "kudu fly", *Bromophila caffra, (n!hoanzoanzoan)*, appears at the time when kudus are giving birth to their calves. The sagine bushcricket *Clonia caudata, (n/hoa/oqnce)*, starts singing at the time when the morama beans are becoming ripe. The Ju/'hoansi were also very familiar with the particular habitat types where most of the insects could be found, and generally seemed to enjoy talking and arguing amongst themselves about the ecology of the different insects.

One particularly gruesome tale which came to light, was the account of how the king cricket *Maxentius* sp. *(/ong/ong)*, a massive and fearsome looking beast, regularly creeps inside Ju/'hoan huts at night times and attempts to consume the contents of Bushmen's nostrils as they sleep on the ground. Ju/'hoan mothers teach their children from an early age to blow their noses before going to bed. Grylline crickets, *//an/ou/xai*, were also considered a nuisance because if they get inside a hunter's quiver they can gnaw away at his grass arrow shafts and within a few days render all the arrows useless.

Final Thoughts

For a variety of reasons, when I finally departed from Nyae Nyae I did so with a sense of sadness. Of course I had had a fascinating time. But it was clear that the younger generation of Ju/'hoansi were, perhaps inevitably, more interested in the fangled trimmings of Western culture that are increasingly filtering through into the Kalahari than in the old ways of their grandparents. The elderly were teased about their having eaten locusts and other disgusting things. Most of the wisdom of the old Bushmen would soon be lost forever. It seemed that in a sense I had come just in time to glimpse the glowing embers of what had once been a blazing fire – a culture arguably of greater antiquity than any other known to man, now fading into the great Coca-Cola sunset.

Postscript and Acknowledgements

A more detailed account of this ethnoentomological study (Green & Marais, *in prep*) is nearing completion. The author has many reasons for being grateful to Eugene Marais (National Museum, Windhoek). Thanks also to Sally Corbet for suggesting I write this article for *Antenna*.

Characterisation of *Culicoides in*
Europe : the vector of bluetongue

Y.M. LINTON, *Dept. of Zoology*
Avenue, Aberdeen AB24 2TZ. (e-

Haematophagous insects have long beer
mechanical transmitters, or as true biol
(=*Heleids: Diptera*) is comprised of 40
erinary importance. The most prominent
over 1000 species described world-wide
sucking behaviour of the females result
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African horse sickness and bluetongu
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Portugal, Israel, Greece, Turkey and Cy

Culicoides imicola is believed to be
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cialised larval habitats (Meiswinkel, 19