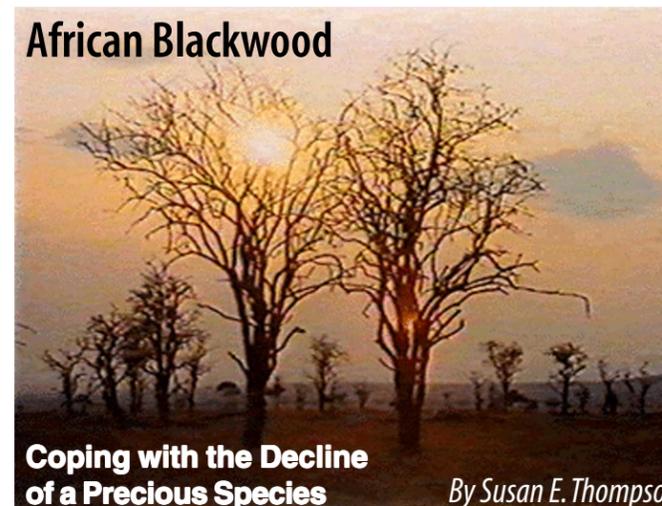




African Blackwood



Coping with the Decline of a Precious Species

By Susan E. Thompson

It has a fine, even texture which enables it to be worked from any angle, and, despite its high density (1.25 g/cm³ or 75 lb/ft³), to be bored and turned with relative ease. Like boxwood, grenadilla can be worked to a glassy smooth finish. This makes it an especially desirable material for woodwind bores where quality of sound is some-

The film called attention to the tree's existence and raised concern about its exploitation. Viewers learned that not only is mpingo the most sought-after material for the manufacture of woodwinds—hence the film's title—but also the most coveted wood of Tanzanian Makonde craftsmen, who use it for the carving of detailed sculptures and religious artifacts. The film also revealed that the tree is regularly consumed as firewood because of its high calorific value, and burnt or scarred in land clearance operations.

Sebastian Chuwa, a botanist who knew the situation with mpingo well, was interviewed for the film. Chuwa's study of herbarium techniques at the University of Dar es Salaam (Tanzania) and work with vascular plants at the Ngorongoro Conservation Area at Kilimanjaro had given him reason to believe that the tree's survival was in danger. In nearby Kenya loggers and carvers had exhausted local supplies of *Dalbergia melanoxylon* without having taken measures to replace them; and Chuwa suspected that the same was happening in Tanzania. By the early 1990s he had made small but sincere attempts to begin replenishing the supply of African blackwood in his homeland, remarking in the documentary, "My 200 Mpingo seedlings are obviously not enough to make much difference compared [to] what is being lost. But next year I hope to have 20,000 seedlings to plant. It is vital for me to act now rather than wait until the future when things have reached a crisis..."

Among those moved to action by the BBC broadcast was James E. Harris, a woodworker from Austin, Texas, who specializes

times linked to smoothness and porosity of material. Grenadilla contains an oily resin that naturally repels moisture in finished instruments. Because condensation from the player's breath tends to run down the bore rather than be absorbed by its walls, the instrument retains its stability and is less likely to crack or go out of tune. Its natural resin possesses antibacterial and antifungal chemical compounds, so that problems of decay or mildew are virtually absent.

Among the most exceptional of African blackwood's properties is that it can be tapped for screw threads. Few other timbers have the metal-like strength and stability to support the pillar and rod-axle mechanisms in modern keywork. This is one reason why boxwood fell out of favor during the nineteenth century, gradually being replaced by denser exotic species from tropical regions: rosewoods, then cocobolo, cocuswood, and finally grenadilla.

An endangered species?

In 1992, the British Broadcasting System in association with Green Umbrella Films released a 50-minute documentary entitled, *Mpingo—The Tree that Makes Music*. (Mpingo is the Swahili word for African

OF THE MANY SPECIES of woods used to manufacture woodwind instruments, none is more popular than African blackwood (*Dalbergia melanoxylon*). Large quantities are processed annually to make clarinets, oboes, and piccolos, as well as recorders, fifes, flutes, and bagpipes, for distribution through international instrument markets. Current consumption is of growing concern to environmentalists and craftsmen, who fear that if harvesting of the parent tree continues at its present rate, particularly without successful efforts at replanting, the species may face commercial extinction.

African blackwood—or grenadilla as it is more commonly called—is the purplish brown core or heartwood of a thorny, scraggly-branched tree indigenous to the savannahs and tropical lowlands of East and Central Africa. Hard, heavy, and fine-grained, it has been used for centuries in carving and turnery to produce farming implements, walking sticks, pulley blocks, bearings, pestles, knife handles, combs, brush backs, statues, chessmen, and ornamental inlay.

Musical instrument makers favor grenadilla because it machines well and is

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HISTORICAL FLUTE NEWSLETTER



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ARDAL POWELL has been awarded grants by the Society of Authors, a British writers' union founded in 1884 with Tennyson, Shaw, Hardy, and Forster among its former members, and by Furthermore, the Publications program of the J.M. Kaplan Fund, to support continuing work on a history of the flute and flute-playing. Powell's work, addressed to general readers as well as to flutists and music teachers, traces threads in the heritage of the modern flute and flute-playing that stretch from ancient times up to the present. As well as communicating new discoveries about the flute's changing design, technology, repertoire, expressivity, and social roles through the ages, the book discusses how flutists may take inspiration from the past in practical music-making today. The book is to be published in due course in a new series on musical instruments by Yale University Press (London). Cambridge and Oxford University Presses have published Powell's previous books. He is also a partner in Folkers & Powell, Makers of Historical Flutes, in Hudson, New York.

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BOOKS

Paul Carroll, *Baroque Woodwind Instruments: A Guide to their History, Repertoire, and Basic Technique*, Aldershot: Ashgate, 1999

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A DATABASE of information on about 1700 18th-century flutes in museums and private collections is now searchable on the World Wide Web. The database was compiled by Ardal Powell, with help from Bruce Haynes and Tony Bingham, as a tool toward a project supported by a Fellowship from the National Endowment for the Humanities in 1992-93. To use the database, point your browser to <http://www.baroqueflute.com/database/data.html>.

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in the art of ornamental turning. Harris considers mpingo to be one of the more desirable woods for his craft because the uniform, unfigured surface color, a dark plum brown, offers no distraction to compete with the geometrical patterning created by the technique of ornamental turning.

The fear that this wood might not always be available inspired him to contact Mr. Chuwa, a move that ultimately led to the formation of the African Blackwood Conservation Project (ABCP) in 1996. Since then, both men have worked closely to forward the project's cause: conservation, germination and propagation of the species. Chuwa engages in efforts to re-establish the tree in Tanzania by securing land for private plots and nurseries, educating farmers and volunteer groups in the ways of planting and cultivation, and then documenting the results for future study. Harris, meanwhile, seeks to ensure the project's development by educating the public and inviting donations through his informative website (<http://www.blackwoodconservation.org>).

How endangered?

Nearly everyone involved with the plight of mpingo agrees with Chuwa and Harris that the species is "commercially endangered". But to what extent may it be biologically and ecologically at risk as well? Hazel Sharman, an affiliate of the Fauna and Flora International/SoundWood project, who has studied the sustainable management of *D. melanoxylon*, wrote in 1995:

The constant removal of individuals [i.e., trees] with the same characteristics will be extremely harmful to the population structure, possibly resulting in genetic erosion. The end result may be a constant decline in the population until it is commercially extinct, leaving, if any, a population structure which may not be able to reproduce and that if it can, will reproduce individuals without those characteristics so highly prized by the trade....

The mpingo takes an estimated 70 to 100 years to reach a suitable size for commercial harvesting. Native loggers naturally fell older and straighter specimens in preference to younger or more crooked ones. Botanists warn that if mature trees continue to be cut at present rates, and if partially grown ones are not permitted to reach maturity, the genetic strain of the species will be weakened.

In essence, seeds from mature specimens will no longer be available for sowing through either natural or controlled means.

Most of the harvesting of mpingo occurs in a region straddling the southern border of Tanzania and the northern of Mozambique. The literature available at Chuwa and Harris's website does not indicate exactly why this is so, but geography seems to indicate the reason. Both countries lie on the Indian Ocean, making their resources more attractive for loggers than those deep within the interior. Harris states that "smaller stands are also found in southern and eastern Africa: in Angola, Botswana, Ethiopia, Kenya, Malawi, South Africa, Sudan, Uganda, Zambia and Zimbabwe, and to a lesser extent, in the Central African Republic, Chad, Cote d'Ivoire, Burkina Faso, Nigeria, Senegal and Zaire." But civil unrest and government intervention no doubt play a role in determining whether it is economically feasible or even safe to set up tree removal operations elsewhere.

The fact that untapped stands are known to exist may be one reason why CITES (the Convention on International Trade in Endangered Species) has yet to include mpingo on its Appendix 2 register or "endangered list", the device that drew the world's attention to the African elephant crisis and shut down the ivory trade. Kenya and Germany proposed that it be considered for inclusion in 1994, but evidence offered during ensuing deliberations was not substantial enough to support this request. As Chuwa and Harris observe:

...hesitation to label [mpingo] as vulnerable or endangered seems to lie in the fact that so little is known about it. No large scale measures have been taken to adequately ascertain its true range, its rate of depletion, or its characteristics of propagation and growth. Even export and marketing data is insufficient to properly determine its true rate of usage.

Buying grenadilla instruments

There is no reason to avoid African blackwood now, especially if you are a musician who is convinced that the properties of a grenadilla instrument best suit your needs for a particular situation. In the first place, nearly all of the *D. melanoxylon* currently being processed for instrument manufacture was harvested at least 5 to 10

Tonal Qualities

Experiments over the years have demonstrated to acousticians that material has no bearing on an instrument's quality of sound, but makers and players remain unconvinced.

Advertisements for wooden instruments regularly claim that grenadilla is a "resonant" wood capable of creating an "exquisite sound", a "noble and living material, [having a] warm, rich and fully round tone with outstanding presence." In Hans Georg Richter, *Holz als Rohstoff für den Musikinstrumentenbau* (Celle: Moeck Verlag, 1988), 32, grenadilla recorders are said to have a tone color that is "bright and projecting, clear, rich in overtones and elegant. . . ."

years ago. Newly finished instruments have been made from aged stock that has been stored in makers' cellars or manufacturers' warehouses, and not from green timber fresh from the bush. Thus, to buy an African blackwood instrument tomorrow does not mean robbing the world of a tree cut today.

In the future, however, buying instruments of African blackwood may not be so easy. Chances are the future instrument will be made from blackwood that at this very moment is maturing in trees still alive. The ABCP's *Mpingo Factsheet* states that in Tanzania, an "estimated 3 million trees exist today." Of these, "only about 20%, or 600,000 trees, are suitable for harvesting. At the current extraction rate of 20-30,000 trees per year, the harvestable population diminishes at a rate of 5% per year." It is unclear from these figures how many trees are actually being cut for the musical instrument industry. But it is noted that the "instrument trade brings in \$1.5M to [the] local economy." According to Bette Stockbauer, a spokesperson for ABCP and author of *A Review of the Literature supporting a Rationale for Mpingo Conservation* (ABCP website, June 1999), "in Tanzania the felling of a blackwood tree [already] requires an official permit for which there is a fee. This is a governmental effort to limit harvesting by imposing a tax and also [serves] as a rudimentary means of recording usage." So the felling of African blackwood in Tanzania, or for that matter

any African country, is probably not going to come to a standstill for economic reasons; nor is it likely to be slowed until harsher restrictions are put into place.

Sharman (1995) notes, though, that "Unfortunately, it is unlikely that such a legal requirement [will have] any effect on the quantity of *Dalbergia melanoxylon* harvested annually. For example in Kibabha, Tanzania, during an interview with the District Forest Officer, he reported that no licenses had been issued for *D. melanoxylon* in his district that year 1994/1995, but that there was plenty of evidence of the extraction in both gazetted, private, and common lands in the area." It is precisely because of what amounts to illegal poaching that ABCP and its sister organizations, SoundBoard and the Cambridge Mpingo Project, hope to win over government officials and private citizens to the commercial advantages of replanting and monitoring the development of the mpingo tree. The ABCP lists among its goals: "To influence individual Tanzanian citizens to raise mpingo on private and public lands [as] this could become a viable source of income for future generations."

History

Grenadilla may have been introduced to Europe by Portuguese explorers in 1497, when Vasco da Gama discovered *pao preto*, or blackwood, on an island off the coast of East Africa. But members of the ebony family (*Ebenaceae*) grow throughout tropical regions too, so much of the dark wood initially carried to Europe may have belonged to the genus *Diospyros*, not *Dalbergia*.

Though grenadilla was mentioned in early flute tutors, it may not have been African blackwood, as a different material, West Indian cocuswood (*Brya ebenus*), has been marketed under similar names. In L.-E. Bergeron's *Manuel de Tourneur* (1816), a hand-painted illustration of the wood shows it to be lighter in color and more brownish than blackish in tone. Thus the species known today as African blackwood may not have been used in instrument making until partway through the 19th century.

The economic imperative

Though grenadilla is one of the most expensive tonewoods to obtain, and though the prospect of reliable revenues may be enough to induce local Africans to become involved in such "sustained management" programs as do exist, the cost of grenadilla is unlikely to go down. Part of the reason for this is that African blackwood cannot be harvested by using efficient technological means. For one thing, its trees do not grow in forests but are spread sparsely over the regions they inhabit, preferring, as Harris puts it, "a solitary existence...in rocky or infertile soils where other plants cannot survive." Secondly, the harvesting process is labor-intensive. Sawing and raw trimming the wood is an art in itself, as many logs contain defects that must be worked around. Finally, after the billets have been prepared, firms like Theodor Nagel of Hamburg import them for distribution to clients. Nagel GmbH, incidentally, has assumed an active role in supporting sustained management of mpingo and was one of the representatives at the IFF/SoundBoard conference held in Maputo, Mozambique in 1995.

New wood must be stored for at least five years to dry out and season. But even the most careful aging of the billets in temperate cellars or climate-controlled warehouses is no sure safeguard against cracking: some pieces of wood are discarded before they ever reach the lathe. Then, because of the very nature of woodwinds, much wood is machined away during the manufacturing process.

To compensate for some of this loss, Boosey & Hawkes has begun offering oboes and clarinets as part of their "Green Line" series. The firm estimates that 75% of the grenadilla used in instrument making ends up on the shop floor. In an attempt to recycle this material, it has devised a composite of 95% granulated Grenadilla wood, 5% polycarbonate fiber and a specially formulated epoxy resin that with heat can be pressed into billets and worked essentially like wood. The advertising for the series reads: "The 'Green Line' material has the same acoustic properties as natural wood. Thus tradition, revolutionary technology, and respect for the environment are united in a more efficient use of natural resources."

These days grenadilla's performance seems reliable enough in flutes, piccolos, and clarinets, but it can be less satisfactory in oboes. Splits between the closely drilled C# and D trill keys are most common, almost expected; and cracks often develop along the grain at the instrument's upper end, where the bore is at its narrowest. The situation has become so grave that some professionals are now playing high-impact plastic oboes produced by Selmer, or in some instances just plastic upper joints.

Of course, any manufacturer who is mass-producing plastic or composite instruments is contributing to the preservation of mpingo. So is the maker who offers instruments made from woods other than African blackwood. Brannen Brothers of Woburn, Massachusetts, and Burkart-Phelan of Acton, for example, give customers the choice of piccolos in both grenadilla and cocuswood; while Lorée of Paris has added rosewood to its offerings of blackwood oboes.

It is unrealistic to think that players—professionals in particular—are ever going to completely abandon wooden instruments. The truth of the matter is that as long as makers have *Dalbergia melanoxylon* available to them, they will continue to supply players with instruments made from it. It is, after all, universally agreed that no other wood is better suited to modern woodwinds. But with the spotlight on mpingo in Tanzania, makers are now more inclined than ever to choose well managed sources of supply and to adhere to the adage: "Waste not, want not."

Susan E. Thompson plays grenadilla instruments by Lorée and von Huene. Her interest in woods may be inherent, as her great-grandfather, Levi Heidrick, was one of the first foresters in western Pennsylvania to run rail spurs from mountain tracts down to the mainline "Pennsy Railroad". She has been a participant in Bruce R. Hoadley's workshop on wood identification at the University of Massachusetts, Amherst, and is assistant curator of the Yale University Collection of Musical Instruments.