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Returning Indigenous knowledge in central Australia: 'this CD-ROM brings everybody to the mind'

Barbara Glowczewski

Laboratoire d'Anthropologie Sociale, CNRS/EHESS/Collège de France
James Cook University, Townsville

***Abstract:** Many people in the modern world identify with a culture essentially transmitted through live or recorded images and sounds. Image and sound are at the core of the traditional transmission of knowledge for many Indigenous peoples. Today, multimedia technology and the internet offer a fantastic way to promote and transmit oral cultures both for the benefit of the Indigenous peoples concerned, as well as to demonstrate the importance of local knowledge in the global system. Though text is still present in the new technologies, audiovisual information allows more direct access to Indigenous languages and cultures.*

Debates about 'New Technology, Anthropology, Museology and Indigenous Knowledge' at the 2001 UNESCO symposium on 'Indigenous Identities' <<http://www.unesco.org/culture/indigenous>> have demonstrated the importance of making these new information technologies available to all Indigenous peoples. Such access will enable Indigenous peoples to control the data available on the Internet and to produce their own tools for education and communication. This will also help to commit researchers and museums to returning material, developing projects in partnership with Indigenous communities and respecting ethical protocols. Drawing on my personal experience of using multimedia technology to return material to the Warlpiri people of Lajamanu, with whom I have been working since 1979, I discuss a part of the Australian experience which has been groundbreaking in this domain.

Indigenous peoples from different countries, especially Australia, have been saying for some time that the data collected over the decades by anthropologists and other specialists is very rarely returned to them. Access to recorded information, descriptions and analyses should be a right for the people concerned. This would allow them to control the representation of their culture and history and teach their children through the education system. People also need to know about the existing data and studies referring to them, so that they can deal more effectively with governments which, when considering land claims and compensation, may ask them for written evidence of their ethno-cultural ancestry. Finally, when people have control of such data, it is possible for them to debate and criticise the existing scientific interpretations.

For all Indigenous societies based on an oral tradition with no writing system, anthropological and other records have become an important part of their own history. But such records cannot be taken as automatically reliable, especially when the government is using experts who refer to old archives or studies to challenge the current oral testimonies of Indigenous persons.¹ This conflict over authenticity is one of the reasons why Indigenous persons claim the right to re-appropriate, and take control of, the ways in which their culture, society, beliefs and knowledge have been represented

¹ On the current critical movement in relation to anthropological classics in Australia see Sutton (1995, 1998) and Glowczewski (1998).

during decades of Western academic dominance. Part of this movement of resistance involves the repatriation of material culture, especially religious objects and human remains that are spread all over the world. It also involves the repatriation of immaterial culture, intangible heritage or intellectual property; that is, stories, songs, language and other knowledge recorded in the past and in the present. Guidelines 28 and 29 of the United Nations' draft principles and guidelines for the protection of the heritage of Indigenous peoples state that:

All researchers and scholarly institutions within their competences should take steps to provide Indigenous peoples and communities with comprehensive inventories of the cultural property, and documentation of indigenous peoples' heritage, which they may have in their custody ... Researchers and scholarly institutions should return all elements of Indigenous peoples' heritage to the traditional owners upon demand, or obtain formal agreements with the traditional owners for the shared custody, use and interpretation of their heritage (United Nations 2000).

These two guidelines cast a new light on the current development of new information technologies. This paper analyses the example of a CD-ROM that I produced to return and restore information gathered through my work to the Warlpiri people from central Australia (Glowczewski 2000).

Re-appropriation of culture

As a French anthropologist, I started to work with Warlpiri from Lajamanu in 1979. Today, Warlpiri are one of the main desert groups, neighbours to the Kukatja and Pintupi persons of the Western Desert. Like most other Australian groups, the Warlpiri experienced violent contact with Europeans, epidemics, massacres, forced sedentarisation on reserves, unpaid labour, and different government apartheid-type policies; but, in contrast with groups which were exterminated or dismantled through the separation of children from their families, they were able to stay together and maintain part of their culture. Their language is still spoken, unlike many of the 200 languages present in Australia before European colonisation began. After a successful land claim in 1976, the old reserve of Lajamanu established in the 1950s became an Aboriginal managed community.

In this context, I became committed to the repatriation of data collected from the elders in a form that would be useful for the younger generation. Many hours of recordings, on audio tape and on film, formed the core for a multimedia program linking images, sounds and texts for the Lajamanu. The aim was not just to make a database juxtaposing different media, but to structure the information so that it could be used by local school students as part of their bilingual Warlpiri/English program. My hypothesis was that if I could transpose the cognitive map of this society (that is, the way that people organise their relation to space and knowledge), then it would be also easier for non-Aborigines to understand the cultural and spiritual richness of this Indigenous knowledge and the complexity of Warlpiri society.

In 1995, Lajamanu school already had some Macintosh computers, and with the quick development of new technologies in the Australian school system, it was probable

UNESCO PUBLISHING

Dream Trackers

Yapa Art and Knowledge of the Australian Desert

Fifty-one Warlpiri artists and story-tellers lead us on a journey through their ritual painting, singing and dancing, on the tracks of their Dreaming Ancestors, who are embodied in the land.

Grand Prix CD-ROM Festival du Film de Chateauroux, Nancy, 1999

Special mention of the Jury Mabiüs Prize, France, 1998

Developed for the Lajam anu Community of Central Australia by Virtual Bazaar and Dr Barbara Glowczewski, senior anthropologist at the Centre National de la Recherche Scientifique (CNRS, France), with support from the Institut de Recherche et Développement (IRD), the Direction de la Musique et de la Danse du Ministère de la Culture and the Musée du Quai Branly, Paris, France.

CD-ROM (Mac/PC) in English or French on the same disc

14 hours of navigation, 500 photos, 3 hours of songs and stories in Warlpiri, 1/2 hour of film

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Yapa is a central Australian word for 'indigenous people'. The Aboriginal notion of *jukurrpa* is the dream as a parallel space-time, a past, present and virtual memory of the earth and the cosmos. It manifests itself as Ancestral and Eternal Beings, the myths of their adventures, the trails of their travels, the rituals, sites or sacred objects that embody their living presence.

Cover of Dream trackers. Yapa art and knowledge of the Australian desert (Pistes de Rêve—Art et savoir des Yapa du désert australien). CD-ROM, UNESCO Publishing, Paris, Geneva and New York

that sooner or later this remote community² would also have CD-ROM facilities. To produce an interactive multimedia program, the data had to be organised differently from a book or a film. The writing of the script had to be non-linear; that is, it had to have autonomous modules of text, sound and image that could be connected with each other. I wanted these hyperlinks to follow rules and to have meanings that respected the connections that the Warlpiri themselves establish according to their own cognitive logic.

Many months were spent arranging the data, according to the Dreaming affiliations of the different local groups. Traditionally these groups used to live around waterholes, hunting and gathering as they travelled between places that were in their spiritual custody. Today, Warlpiri still identify with those places of origin, and they celebrate them in rituals during which they dance, sing and paint their bodies and sacred objects. In the mid-1980s, they also started to paint traditional designs—which always refer to places and their connected totems—on canvas for sale. I chose a sample of such paintings, classified according to the totems they represent and their respective countries, as the organising structure for all the data.

I then worked then with a fantastic Warlpiri lady, Barbara Gibson Nakamarra, custodian of the Yawakiyi Plum Dreaming, daughter of deceased ritual leader and herself very knowledgeable, having lived a traditional hunting and gathering life until the 1950s. She helped me with the translations of the many songs and stories I had collected from some fifty Warlpiri and checked the general structure of the information and the way things were connected. All the selected material was classified into fourteen local groups, each identified by the totemic names of the ancestral heroes, animals and plants who travelled and left their imprint in special places. The project was then presented to the community with a press-book and an audio tape.

Back in Paris, with the assistance of a computer laboratory (LIA, IRD), I produced a digital pilot with the whole structure and some of the data. I then showed it to the community on my laptop in July 1997. Three months later, after having integrated more data, I organised with Qantm Indigenet, an Australian organisation promoting Aboriginal access to internet and multimedia, a one week workshop in the Lajamanu School which had just received ten new Macintosh computers with CD-ROMs. The workshop was very exciting as the children could show their family how to navigate on the screen to check this 'Yapa' ('Aboriginal people' in the Warlpiri language) program written in HyperText Markup Language (HTML). Both young and old were very enthusiastic about seeing and hearing their own people in a way that respected their traditional classifications. Elders were especially happy about the ease with which the information could be accessed directly by children or adults who cannot read and write, and the fact that there were three hours of Warlpiri speech or songs by over fifty representatives of the community. It was agreed that I should continue to develop this restitution program for use in the school.

² The nearest settlements are Wawe Hill, 100 km to the north, and Yuendumu, 300 km to the south.

Cultural constraints

The workshop also aimed to make the community conscious of the risks involved with new technologies, such as the possible transfer of HTML through the internet to anybody in the world and issues of cultural copyright over collective traditional material, such as songs, designs and other knowledge. I was ready to recognise the Warlpiri intellectual property over the content of the CD-ROM, their right to control the access to it, and also their right to a royalty if it was distributed outside the community. At this stage, some members of the community were worried about the internet, so I decided to stop using HTML and JavaScript (languages of the internet) and to shift to Lingo Macromedia Director software which does not allow direct display on the internet. This made the project more expensive because it now required a professional to reprogram everything, but I was committed to continue and personally funded this technical change.

In the making of this CD-ROM, several cultural constraints had to be taken into account. Despite my first language being French, I had to produce it first in Warlpiri and then in English so that all persons involved could check the content themselves. It included not only the 51 artists whose acrylic paintings on canvas were presented in the CD-ROM, but also other elders who had cultural and religious rights to the totems and places referred to in these paintings, and in the songs, stories and dances related to the designs. The second constraint was to select only data that could be made public, according to the secret/public definition of the Warlpiri; all the content had to be checked by the appropriate custodians of the different ritual sections. I also had to be very careful not to use a language that could refer to secret aspects. For instance, initiation includes circumcision, among many other rituals, but as this word should not be pronounced publicly, it is replaced in the CD-ROM by expressions used by the Aborigines of the desert (e.g., ceremony, business, man-making, going through the Law that transforms boys into men) and no other details are given.

Another aspect of the secret knowledge is that many elements connected to men's Law and knowledge are secret and cannot be presented publicly. Part of women's Law is also secret and cannot be shown, but many women's rituals—*yawulyu*—can be shown, including body-paintings and ritual objects. Gender complementarity is a very important feature of Aboriginal desert culture. As one film in the CD-ROM explains, 'Men Law and women Law go level, both are custodians of the country'. Being a woman, I chose from the beginning to work mostly with women, and was able to demonstrate that their public rituals are strong and fundamental to the society as they look after the land and its eternal spirits. Once the men saw the pilot version of the CD-ROM, and the scope of women's and men's public painting on canvas, some decided to record a public version of their songs to add to the program. The whole data was checked again, with the invaluable help of a Warlpiri language teacher, Elisabeth Ross Nungarrayi, who also contributed a new song for her country and Dreaming inherited from her father. Unlike the editing of a film, multimedia programming allows such additions and modifications which can be shown back during the long process of consultation with the community.

An additional but essential constraint was to respect the taboo relating to the dead. For most Aboriginal traditions, the name of the dead person cannot be spoken—nor anything homophonically relating to this name—until the end of the mourning period

which can last from two years to a generation. This custom also applies to other representations of the dead person, such as verses of songs or places connected with his or her totemic spirit that have to be avoided, and has been extended to photos and films. The Lajamanu community would only use the CD-ROM in school if the images of the dead could be hidden when required. So we had to develop a tool that allows photos of persons who have passed away to be hidden. The users now have the option of hiding photos (replacing them with an icon: the Aboriginal flag) or disclosing them if they wish. The hide photo option can be modified at any time from the screen and stays in place on the hard disk when the computer is switched off and back on.

A network of stories

The CD-ROM opens with a schematic map representing a selection of 47 Warlpiri sites connected by a network of lines and the following oral explanation:

The Central Australian desert is criss-crossed by hundreds of trails connecting springs or rocks. Each trail has stories about the making of the landscape by animal, plant, fire or rain Ancestral Beings. Aboriginal people, Yapa people, call them Jukurrpa, Dreaming Ancestors, the trails of their spiritual Law and Culture. Choose a trail to discover these stories and their rituals.

The word *Jukurrpa*³ is written in red on the top of the screen as it is a hyperlink. When a mouse is dragged over it, a red card appears with the following text:

Dream and *Dreaming* in Warlpiri language. Also used in other Desert languages (Pitjantjatjara, Pintupi, etc.) to designate the Ancestral Beings, their totemic names, the trails of their travels, the stories about their adventures, and the space-time in which these events are registered for ever and in which they travel in their dreams. Jukurrpa is also the spiritual component that every man and woman shares with a totem (animal, plant or other) one embodies. It designates some of the women's or men's sacred objects which are imbued with the Dreaming life-force, *Kuruwarri*, or spirit-children, *Kurruwalpa*.

The words Dreaming, Kuruwarri and Kurruwalpa are also hyperlinks with red cards showing their definitions. This tool, which directly connects with a Warlpiri language glossary, applies to all Warlpiri words and concepts mentioned in the CD-ROM.

When the mouse is dragged over any part of the map, an icon appears on the right-hand side representing the connected totem with its Warlpiri and English name. The fourteen main totemic names of the Lajamanu groups are listed and when the mouse is dragged over one of them, the corresponding lines on the map are highlighted in red to show which places are linked by a trail with this totemic name. The main totemic names refer to Ancestral Beings who are conceptualised as part-animal or plant, or as elements such as fire or wind, or as persons named by cultural objects such as digging sticks or poles. Everything that is named in nature and culture has its Jukurrpa or Dreaming. This principle is eternally present in the Jukurrpa space-time, the virtual memory of the cosmos and the people; all such principles are inscribed on the land as sites created or shaped through imprints left by the eternal Beings.

³ Jukurrpa in Warlpiri is Tjukurrpa in Kukatja and Pintupi.

The Warlpiri have thousands of toponyms naming waterholes, hills, rocks, trees and creeks over a desert territory extending 600 kilometres north/south and 300 kilometres east/west. I only selected about one hundred places as examples of the intertwining structure of the perception of desert Aboriginal mythical and geographical space. The map is only a graph, a topological map, which shows points in relation to each others, as deduced from the stories included on the CD-ROM. People say: we needed two camps (*ngurra*) during the wet season to go from place A to B to the north, we would always stop in C on the way, to the west we could see the Dreaming trail of the Yam and to the east the trail of the Possum, and when we (or the ancestors) looked back south at midday we could still see the rock of D. There might be contradictions in cross-checking all the mythical stories and life-stories, not only because memory changes but also because geographical elements can shift: sand dunes travel with the wind, creeks can change their flow during floods, water which comes up when digging underground can disappear when soaks are dry. We tend to think that the physical order is permanent, but my understanding of the Warlpiri perception of desert space is that it is always moving, breathing they would say, even though the principles (the Dreaming as virtual life force) remain permanent.

The number of trails between two places is infinite; there are as many itineraries as there are ways to travel, track game or collect food. Metric distance is not necessarily meaningful in the desert; people measure space in time rather than kilometres. If travelling from one point to another at a given time, the time required might change according to the season, the size of the group, the age of the children, or the availability of resources. During the hottest season, people would sleep in the day. Sometimes they would dig themselves in the ground, heads covered with a shield or a dish so as not to be burnt, and they would rush through the night to cover as much distance as possible, especially if they knew that there were no water sources on the way. The perception of the desert expands and contracts accordingly—even today when travelling is done by four-wheel drive or by plane. In this sense, the Desert Dreaming web is an Indigenous mental representation of the '*espace itinérant*' (itinerant space) of hunter-gatherers as opposed to the '*espace rayonnant*' (radiating space) of sedentary cultures as represented in Genesis. But, contrary to Leroi-Gourhan's (1964) idea of '*espace itinérant*', repetition of travelling is not equivalent to a static perception of time and action. In the cognitive world of the Aboriginal hunter-gatherer the need for adaptation is also conceptualised.

Cognitive mapping and land rights

The graph of sites and trails in the CD-ROM does not pretend to be a real map with real distances, nor are the red lines of the trails real itineraries, because most Aborigines do not want to make public the location of many of their sacred places. To help protect these places, I have respected this concern.

The Warlpiri number around 4000 today, some living in Lajamanu, others in other communities, including Balgo in Western Australia. Traditionally they occupied this giant territory by travelling according to seasonal and climate changes. They were divided into groups of fluctuating size which were formed through descent, alliances and specific ritual and spiritual connections. Each man and woman shared with others the ritual custody of segments of trails (including some land, but not specifically tracts of land) around the sites which the trails connected. Men and women had to marry not

just outside of their local (totemic) group but also with somebody who was a custodian of a Dreaming trail positioned as in a 'spouse' relationship with their own Dreaming trail. Family groups would often travel hundreds of kilometres in a year, but only some of the country and places that they crossed and used, water sources or other sites—hills, caves, rocks, ochre or quartz deposits—were considered to be their property and their ritual responsibility; for instance, significant places where rituals had to be performed to allow the maintenance of the connected totemic species, or phenomena, to make rain, to assure the growth of yams at each season or the reproduction of goannas. No ritual could take place with only the custodians (*kirda*) of the place and Dreaming, some of their allies, nephews and brothers-in-law had to be present in the ritual role of manager (*kurdungurlu*, policeman, lawyer or worker as the central Australian Aborigines say today).

The CD-ROM interactive map is an attempt to illustrate as simply as possible the complex web of the cognitive mapping of the land in the desert and especially the fact that, when actualised together, all the itineraries seem to criss-cross. But the trails are not just inter-twined over a flat space—that is, the surface of the land—some go underground (those of small marsupials, reptiles or roots), others travel in the sky (like birds and rain). In this three-dimensional web there are lot of common places which have two or more trails—to two or more totemic species and their custodians. Not all places crossed by the trails are necessarily owned by the holders of the respective trails; often the rights are shared between two or more groups. This causes a headache for land claimants from the Australian desert groups who all share such a vision of space and land. How can the right owner be identified according to the Western legal process? Aborigines know, when they travel, that from the point-of-view of the Kangaroo ancestral Being, it is the group of the Kangaroo custodians—his spiritual descendants—who are the owners of the place connected with the Kangaroo Dreaming (because of some ancestral action that was preformed in that place). But a few metres from this site, one can find prints left by the Yam ancestors and a soak that is owned by the Yam custodians whose other main sites go in another direction. The visual transposition of this Aboriginal cognitive mapping into an interactive map gives the user an immediate experience of this inter-connectivity which proceeds from the same logic as the web. Multimedia is an ideal tool for rendering this Indigenous mapping.

As anthropologists, we are expected to write books with an introduction, a conclusion and a linear development to present different aspects of the society in question. But to present an Indigenous society and its knowledge from the inside, talking about the Kangaroo group before the Rain group, may create false impressions of hierarchy or causality between the elements presented. It has to be said that the Warlpiri totemic groups do not organise themselves in a hierarchical way. People do not say that the Rainmakers as a group have more political or religious power than the custodians of the Kangaroo Dreaming, because both water and kangaroos were necessary for the traditional survival of the society. This ontological interdependence does not prevent conflicts between individuals and groups, and power relations expressed by word, strategic action, violent physical confrontation or sorcery. But such socio-political dynamics will not be justified in the name of precedence or set hierarchy between the totemic ancestors. Dreaming stories describe many conflicts and battles between ancestors of the same or different totem, very often as motivated by the desire and hunt for a prey which can be consumed. Opposed to this conflict of desire is the autonomy of each species, including gender: female or male heroes often live in pairs or

in a group of one gender only. This tension between autonomy and interdependence is relayed in the social order by different rules: one should marry outside of his or her own totemic group; custody of land and totemic transmission tend to be restricted to the patrilineal group which shares the same totemic name; but some places are shared by different groups. If the Rain Dreaming is the responsibility of one group, rainmaking benefits everybody. Similarly, the rituals for the Kangaroo Dreaming benefit everybody, not only as a main source of meat, but also because this marsupial Ancestor is connected with an initiation that applies to all Warlpiri men (and many other tribes too). Each totemic group in the society—like men and women as opposite genders—has a complementary role to play which is constantly renegotiated in relation to land.

A dynamic tradition: the language of prints

Warlpiri people and their neighbors in the desert say that painting is feeding the body and the mind, each painting has a Dreaming name, Jukurrpa, the trail of an animal, a plant or another Ancestor like fire or rain. The totemic signs which are ritually drawn on the body, the sacred objects or the ground, are also painted on canvas for sale in galleries all around the world.

This oral commentary in English (or French)—the only one after the introduction of the CD-ROM—accompanies an interactive contents page presenting a mosaic of 32 paintings with their totemic names and a column of fifteen signs. When the mouse is dragged over any of these paintings—produced on canvases, bodies or ritual objects—some of the signs listed on the right of the screen turn from white to yellow: these are the signs used in the selected painting. When the mouse is dragged over one of the fifteen signs, some of the paintings' titles turn from white to yellow, indicating the paintings that contain those signs. This interactive presentation allows the same signs to be used in paintings connected to different Dreamings. In other words, Warlpiri signs, like other desert signs, are polysemic, and cannot be read as conventional icons or hieroglyphs to decipher.

After clicking on the painting vignette, the viewer accesses a page showing other paintings of the same totem. The viewer can then click again to see the painting in full screen with related explanations or call for the artist's file (with links to the artist's other contributions in the CD-ROM). The paintings and their specific signs all have meanings, but these are contextualised according to a minimal iconic rule: the signs reflect the position in space of the objects or concepts to which they refer. A circle can be a place or any object that leaves a circular imprint on the land, a line is a sleeping person or a link between two places, a meander line also expresses a link between two places, but when the totem follows a meander road, such as a creek, it expresses yam roots or fire. Half circles (U shapes) are persons (or other beings) sitting on the ground. A male will be identified when the tools placed next to him are a spear or a woomera (a line and an oval with a little tail for the spear thrower), a female will be identified by a shorter stick and an oval representing her coolamon dish. An arrow can refer to any bird—including the non-flying emu—and an E shape to a possum, because these are the tracks these animals leave on the ground. Some signs are combined into a recognised totemic design, but other combinations of signs are common to several totems (for instance, two or three circles connected by two or three straight or meander lines).

Beyond this minimal coding of the print system, no further deciphering of the paintings can be done unless the artist provides the meaning of the signs, the story and

the connected songs associated to the painting.⁴ Warlpiri call their paintings *kuruwarri*, a word which is also a synonym of Jukurrpa, Dreaming and story; signs are called *yirdi*, print, word or song verse.

The CD-ROM presents 100 canvas paintings with commentaries. For each Dreaming there are many photos and films of ritual painting and dancing, oral recordings of one or several story-tellers in Warlpiri with written translations of his or her version of the myth. Each story is also presented through a selection of songs by women and some men, the verses of which are transcribed and translated. Such song-lines are cryptic and condensed versions of the stories. Some verses sound like a long word, which is often the Dreaming name of a live or dead person. Warlpiri, and some of their neighbours, consider that each person embodies the spirit of such a song verse: it is the verse that gives the baby the power to 'articulate' both speech and motion.

There are many ways to tell stories, to develop different angles, interpretations, and connections, according to one's own style and experience. Even new episodes can be added: Warlpiri say they can communicate with the eternal ancestors who sleep in the sacred sites when their spirit travels in their own dreams—especially when they sleep in these sites. All the sleepers of one camp are often asked to share their dreams as their collective experience is considered to be 'the same dream'. When it is recognised, through the interpretation of a dream, that the dreamers travelled in the space-time of a given Dreaming, the dreamers' vision can be materialised through a new song, a painted design or a dance. Such dream creativity is seen as information given by the Dreaming virtual memory, even though it may be an adaptation of a recent event that affected the living. From the Dreaming point of view it is 'actualised' by Jukurrpa, the virtual matrix and its ancestral inhabitants. The Dreaming is not a golden age or an eternal repetition of something without past or history. Just like the evaluation of space in the desert is relative to the speed at which you can travel, the perception of time is relative to the way you treat an event: sometimes it is to be forgotten or temporarily avoided because of a death or a conflict, at other times it is to be remembered and transformed to be projected in the future and set as an example.

People's actions can be used to confront new problems. Traditionally such problems might have included a drought, a cyclone, a demographic fluctuation, the need to change seasonal routes because of the unavailability of resources, when people were too numerous in one place or when a drought lasted several years. All this change had to be managed in a way that could be authenticated by the ancestors, that is explained in the spiritual Law system which allocates places to people but also legitimates their sharing of common rights in some places. It is this ancestral logic that allowed the temporary gathering of several hundred individuals in the same place, while most of the time they travelled in very small family groups.

The fact that this flexibility was recognised as part of the dynamic structure of the Dreaming trails is extremely important today when land claims are subject to royalty payments. Shortly after the Warlpiri won a land claim over part of their traditional territory in 1978, mining companies were attracted to look for gold (an activity which

⁴ It is the same with the Warlpiri hand-sign language in which signs are distinguished not just by their shape but also by their movement. Over 4,000 signs have been recorded in this language so far. Some examples (of totems and kinship terms) are shown in the CD-ROM.

had ceased after the gold rush at the end of the nineteenth century). Today over twelve international trusts have exploration licences, but every time a new tract of land is to be opened to exploration, they have to negotiate with the Lajamanu owners and Aborigines from other communities, such as Balgo. This process involves establishing lists of the traditional stakeholders who are entitled to royalties. Before Europeans arrived and began mining in the region, this part of the Tanami Desert was an important traditional gathering site for different ceremonies, but not all Warlpiri groups had a relation of spiritual custody to the place. The drought of the 1920s attracted many Warlpiri to the gold rush camps where many of the current elders' generation were born. Requests by their descendants for a share in the royalties have to be negotiated with the original custodians who claim to be the only beneficiaries. Nevertheless, sharing tends to be recognised by the majority who do not agree that just a few should become 'millionaires' when traditionally all sites were supposed to be complementary within a land system that maintained a balance between all the groups. One current solution to try to prevent inequalities involves paying some of the royalties into a collective fund which benefits the whole community.⁵

The power of connections

Many Dreaming itineraries do not stop at the site a group identifies as the boundary of its segment in a given direction. Custodians often say that their Dreaming segment is continued by another group, which may or may not be of the same language group. Some of these trails, like Emu or the Two-Men/wind/lizard, are passed from group to group along thousands of kilometres; these groups did not all meet traditionally, but their ritual objects (or other artefacts) could travel across the whole continent, through exchange partners (set through namesakes in the northwest of Australia), by the transmission of rituals and along mythical lines. The result is that the same Dreaming heroes continue their travels from one group to another: similar events can happen to them in different places but most of the time the story unfolds like a serialised story. For instance, two men are said to have given shamanistic practices and kinship rules to the groups they encounter, but in different language groups they give different systems (eight sections, four sections, exogamous or generational moieties). The important thing is that, even if Dreaming heroes are said to stay forever in the places they visited, created or 'imprinted', they come from elsewhere and go elsewhere. This limitlessness is a virtual principle for establishing new connections; it enables the Dreaming language to be reformulated and new bonds to be passed on to people today.

With age and experience, men and women acquire information about how to connect knowledge between the different Dreaming heroes both inside and beyond the tribal territory.⁶ It is the extension of alliances and experiences that gives a wider understanding of this web of connections; knowledge at this level is more than just

⁵ On the subject of land negotiations in relation to mining, see the thesis by Derek Elias (2001).

⁶ The use of the word tribe has been banned from Aboriginal studies for legitimate reasons relating to its perjorative usage among administrators, politicians, some journalists and their audience. It has also been criticised in anthropological debates. But the Warlpiri people and many other Aboriginal groups still refer to their specific language group as a tribe as opposed to other Aboriginal language groups. In the current French understanding 'tribe' does not sound perjorative, but it can be when used in a colonial or postcolonial context. I believe that this word should be re-evaluated because it is valued by people who find in it a way to express the solidarity of their extended family ties and a specific social organisation related to the environment.

content, it has the capacity to link together the right elements. This cognitive process is not necessarily directly taught, it may be acquired through participation in many rituals and travels. As an anthropologist, it sometimes took me several years to deduce meaningful connections which I did not see when recording the data. Had I only recorded stories, I would have missed many of the connections which appeared when relating them to other data collected during the performance of rituals, dancing, painting and singing. The CD-ROM was not only an ideal medium to restore Warlpiri connections, it also helped me to synthesise the whole network as a virtual means of exploration through pre-programmed hyperlinks interconnecting texts, images and sounds. For instance, every time a story-teller mentions the name of a Dreaming trail which is crossed while narrating another Dreaming trail, or a place name which is connected to another Dreaming, these names are highlighted in red and allow a link to the screen displaying the story of this other trail.

This invitation to wander in the territory of the Dreaming story-telling, painting, singing and dancing made the old persons extremely happy when they saw tangible proof of their teaching about the inter-relatedness of the Dreaming. The elders and all the women I worked with were excited by the new medium because it did not threaten their encyclopaedic knowledge or their power in the society. On the contrary, their legitimacy was affirmed by the fact that they are recognised by name as story-tellers and painters. They could see that only the public side and a small part of their knowledge was used to demonstrate that relations connect persons to elements of their environment and to a spiritual realm. The CD-ROM was going to confront the problem of children not learning enough of the traditional knowledge—survival skills, geography, medicinal plants, dancing and singing—because they spend most of their time at school; and the elders and the women recognised this. They were also proud to be able to present their culture to persons outside of their community using this medium.

Some of the middle aged men had different reactions, however. They were of my generation (I was 23 years old when I started in 1979). They wanted to know why strangers should be able to easily access the connections between things, to become familiar with information that takes a lifetime to understand in just a few hours. The ‘understanding’ they talk about is different from the immediacy (snapshot effect) of digital information. Their knowledge is imprinted in their bodies and mind through physical and metaphysical—abstract and esoteric—experiences which require collective performances, feeling of country and spiritual sharing. But these men, who have been involved in complex negotiations with developers and government officials for many years and who have endured the struggle for self-determination, no longer have as much time to spend with their elders to learn traditional knowledge. A similar resistance occurred in the early 1980s when Warlpiri and Pintupi from another community, Papunya, who had transposed their totemic designs on canvas, started to exhibit and sell the paintings all around the world. Some Lajamanu men were very worried about what they saw as a decimation of the traditional designs they share with this community because of common Dreaming trails. Nevertheless, they themselves started to paint on canvas in 1986, after meetings with the Papunya elders and some other communities where they decided what content could be shown and how it had to be visually presented. Lajamanu is located on the traditional land of the Kurintji language group, but the majority of who live there now are Warlpiri deported from lands further to the south.

After I installed the CD-ROM at Lajamanu school in August 1998, a controversial community meeting led the Council to decide that the program was very good for the school but should not be commercialised outside the community: culture was too precious to become a commodity. A year later, another big meeting was organised in my presence with the Council which decided this time to release the CD-ROM for display, but only in museums and research libraries, like universities. The idea was to attract persons willing to learn and with an earnest approach to research. The confidence in institutions which aim at educating large audiences is based on the hope of creating new conditions for cultural sharing. It is in this spirit of exchange that twelve Lajamanu men accepted an invitation to visit Paris in 1983 and to dance and make a gigantic ground sand painting,⁷ and that artists continue to travel to different cities to dance and paint for the launch of their canvas paintings in galleries and museums.

The challenge with the CD-ROM was to find a solution for the distribution that would respect the wishes of the community and the cultural property rights of the artists. In 2000, UNESCO Publishing signed a contract with the Lajamanu Art Centre, Warnayaka, to co-publish the CD-ROM and to share the copyright and the benefits through licences granted to institutions and individual orders addressed directly to UNESCO. The new version which came out in French and English under the title *Dream trackers: Yapa art and knowledge of the Australian desert (Pistes de Rêves)* was presented by Jimmy Robertson Jampijinpa, a Warlpiri artist, then manager of the Lajamanu art centre, during an international conference.⁸ In an interview with the UNESCO journal (*Source* June 2001), he noted that 'This CD-ROM brings everybody to the mind'.

Access to technology

A question for the future is: what means do Indigenous communities have to control the chain involved in the transmission of knowledge? Multimedia technology can only be advertised so long as it does not threaten to become a mode of fixing a culture which is a dynamic process, evolving through social transformations, individual and collective experiences, community art and personal styles. The Warlpiri have shown that they master this dynamic aspect of their culture even when traditional transmission is not restricted to the old ways. Writing about oral cultures has already questioned the vitality of orality, but it has not stopped people from continuing to invent stories or reinterpret the old ones. Books on anthropology and oral history are not bibles because the written text does not serve as the core of the cultural and spiritual beliefs; it is still the ritual action and the exchanges between people which lead the control of knowledge in, and between, Aboriginal communities. In this sense the power of the elders cannot be threatened when initiations continue to be performed and children learn from the land.

⁷ Théâtre des Bouffes du Nord by Peter Brook, the ARC and the Musée d'Art Moderne. Part of the exhibition 'D'un autre continent—I' Australie, le rêve et le réel', organised by the Festival d'Automne 1983.

⁸ 2001 UNESCO Symposium, 'Indigenous Identities: oral, written and new technologies', co-organised by the author at UNESCO in Paris; see the report available at <<http://www.unesco.org/culture/indigenous>>. The multimedia version of the 2001 symposium promoting the 2003 Charter for Cultural Diversity has since become available as: L. Pourchez et al (eds) 2004 *Cultural diversity and indigenous peoples: oral, written expressions and new technologies*, CD-ROM, Unesco Publishing, Paris.

The power of interpretation lies with the whole system of belief which is in the hand of those who practice this culture.

When the elders' experience cannot be physically shared, the question of cultural reproduction becomes an issue. We know, however, that data recorded in books or other mediums always remains open to future reinterpretation and criticism. Historians and specialists on literature and art have demonstrated this many times. It is time to also recognise this in anthropology: anthropological books all carry some useful information about the given society, either the one observed or its relationship with the society of the observer. It is also important to recognise that different interpretations can co-exist. With multimedia, the advantage is that you can hear the songs and stories and see through films and photos the visual elements that persons connect with the oral elements. But another story-teller could tell the same story in a different way. I did not include in this CD-ROM anthropological interpretations published elsewhere (Glowczewski 1991, 1996). There are only a few texts contextualising some key domains (art, artefacts, church, fieldwork, hand-signs, healing, history, hunting, kinship, land-rights, law, rituals, taboos). The data presented is only a sample collected at a given time (between 1979 and 1998) of the huge cultural heritage of the Warlpiri, but it is structured as an open network according to the Warlpiri mode of mapping knowledge.

I was often asked 'why should the recording stop there?' My answer is that if Warlpiri wish to continue the project they should be assisted.⁹ Multimedia technology requires money and technical expertise, but just as Aborigines in Australia adopted video recording in the 1980s and teleconferencing in the 1990s, they are now starting to use new technologies, including the internet precisely to record their culture.¹⁰ The Maningrida community in Arnhem Land had a website for several years: it showed examples of songs, didgeridoo players, paintings for sale and the community telephone. This site was so popular that the community was inundated with orders for art works as well as questions from users wanting to know more about the culture or to come and visit them. The site was closed because of this popularity: the community could not keep up with the demand. It has since been redesigned to respect their privacy.

The focus now is on using new technologies as tools for recording and connecting. While many museums have put their collections on the internet, Aborigines say information relating to their objects should be controlled: they want to decide what can be made public or not. They would like that all information related to their specific groups to be made available through the internet—but only to the community concerned. In other words, if there are Warlpiri objects in certain museums, a process should allow the Warlpiri, but the Warlpiri only, to access the inventory of these objects as compiled by each of the museums through the internet. This idea led to the concept of an Aboriginal Gateway, which is being developed by the AICN (Australian

⁹ The project of a Warlpiri linguistic encyclopaedia was undertaken in the 1970s with the participation of several linguists and Warlpiri specialists (Laughren ed.). A temporary CD-ROM, 'Kirrkirr', a graphical electronic interface to the Warlpiri Dictionary, was developed at the University of Sydney by Kevin Jansz, Christopher Manning, and Nitin Indurkha. Information about the development of the project is available on the site of the linguist David Nash at <<http://www.anu.edu.au/linguistics/nash/>>.

¹⁰ Melinda Hinkson (1999) has recently analysed the use of different audio-visual technologies by the Warlpiri people of Yuendumu. Hinkson has also produced the CD-ROM, 'Yardiliny', with this community and the South Australian Museum.

Indigenous Cultural Network) at the Australian Institute of Aboriginal and Torres Strait Islander Studies in Canberra, with the pilot project of the Pitjantjatjara Council (Gulash & Arley 2001). Australian museums—like Canadian ones—have agreed to work within new protocols which require respect for cultural constraints. This may involve producing databases which function with passwords to allow the right group to access information through the internet. This process, which associates the recording of heritage with the repatriation of knowledge, should be encouraged so that cultural objects spread all over the world can be reunited through the establishment of virtual museums.

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Barbara Glowczewski is a Director of Research at the Centre National de la Recherche Scientifique in Paris and a Member of the Laboratoire d'Anthropologie sociale <<http://www.ehess.fr/centres/las/index.html>>. She coordinates a postgraduate research seminar on the 'Anthropology of networks' at the Ecole des Hautes Etudes en Sciences Sociales, Paris. Dr Glowczewski has been working in Australia since 1979, first with Warlpiri, then with different groups in the northwestern Kimberley, especially in Broome, home of her husband, Jowandi Wayne Barker, Aboriginal film maker and composer. At the invitation of James Cook University, as an adjunct Professor, she has designed an international program on 'Indigenous strategies of communication: cultural festivals and new technologies' with Rosita Henry (James Cook University) and Professor Marcia Langton (University of Melbourne). Author of several books and many publications in scientific collective books, journals and multimedia productions, Dr Glowczewski also has contributed to exhibitions, radio and television shows, and films. Her next book is titled *Rêves en colère. Alliances aborigènes d'Australie* (Plon, Paris).

Centre National de la Recherche Scientifique, Laboratoire d'Anthropologie Sociale, Collège de France, 52, rue du Cardinal Lemoine, 75005 Paris <barbara.glowczewskibarker@jcu.edu.au>