THE NAGA VIDEODISC MANUAL

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CHAPTER ONE. NEW INFORMATION STORAGE MEDIA

The potential of new information storage devices.

During the last few years it has become possible to combine media in new ways. Until the end of the 197O's, a computer was still a statistical and textual manipulating device. Even here the capacities of 'desk-top' computers were very limited. During the 198O's the power and storage capacity of such computers has increased exponentially.

Nowadays, for instance, computers can conventionally have access to stored information on hard disc or optical disc ranging from 2O to 4OO megabytes. Such quantities would only have been envisaged with the largest mainframe computers a few years ago, and even then only in special circumstances.

These desk-top computers are still slower than large 'mainframe' computers. But within a few years they will be more powerful and faster than any mainframe of preceding generations. Furthermore, they provide interfaces (e.g. WIMP, windows, icons, mouse, pull-down menus), which are infinitely more flexible and user-friendly than previous mainframes. Likewise the cost of storage and computational power is constantly decreasing.

These changes, with storage of hundreds of megabytes of direct-access information on optical disk storage already announced, presents the possibility of ordinary users setting up large textual and statistical databases on their own dedicated and 'user-friendly' machines. But as the databases grow in size and input methods improve, the need for more powerful information retrieval methods increases likewise.

This has led to the proliferation of database management systems, mostly based on the 'relational' model, for example the well-known DBase series. These are somewhat blunt tools, however, and this manual will among other things, describe an example of the next generation of 'probabilistic' retrieval systems.

The potential and problems are increased significantly when we come to the second major development. This is the increasing possibility of incorporating sound and film and linking this to the textual and statistical data. We can now begin to envisage the computer as a combined textual/visual/statistical tool for manipulating simultaneously words, numbers, images and sounds.

There are two developments which have made this possible. On the one hand the increased storage capacity allows one to 'digitise', that is to turn into digital form the images and sound (compact disc holds digital sound and it can now hold digital images). The main limitation on this at present is that a single image requires a great deal of space in such a digitised form, which precludes the use of moving film in this format. No doubt compression methods will be found, and some have already been devised to overcome this limitation. The great advantage of having the image in digitised form is that it can be manipulated, printed out, deleted or replaced with ease. In other words, pictures and sound become like any computer files.

When the read/write combined optical and textual systems are available with the new generations of computers, we can envisage a situation when a use will have a dedicated device that can simultaneously hold hundreds of thousands of separate items of information; an item might be a piece of music, photograph, moving film, paragraph of text, index card, statistical table. To a certain extent this was achieved by the BBC in their 'Domesday Disc' in 1986. But in the future numerous users will be able to set up their own libraries and archives, each one uniquely tailored and often the size of a moderate conventional library of today.

All this is in the near future. At present, the only way to combine large optical data sets with texts is by the use of optical disc or video-disc, using analogue rather than digital storage of data. Consequently, in the rest of this manual we will describe a prototype system developed on videodisc, which is used alongside a textual database. Since many are not familiar with optical discs and their potentials, we can start by looking at their nature and potential before looking at how we transferred different types of materials into the textual and optical database.

The nature and potential of videodiscs.

A videodisc or optical disc is a silver object which looks like a gramophone record. Information is engraved on its surface. The information is read off each separate track by a laser beam within a videodisc player. This provides a virtually indestructible storage format which is not damaged by dust, normal changes of temperature, electric currents, damp or insects. As described below, IV is characterised by two key concepts: 'random access'" and 'branching'.

A videodisc can hold a very large quantity of information. A standard disc can play moving film for 36 minutes per side in interactive mode or hold 54,OOO separate pictures per side, or a combination of these. It can store at least 3OO megabytes of information per side. This means that it would be possible to store the whole of the Encyclopaedia Britannica, pictures and words, on about two thirds of one side of a videodisc.

A videodisc can hold copies of almost all kinds of recordable information: photographs, slides, moving film, x-rays, sound recordings, graphics, manuscript sources, printed works. A disc has a visual track and two sound tracks. The sound tracks may be used for sound or for digitally encoded textual information. The discs are double-sided and once a master has been created copies may be made relatively easily and cheaply.

There are essentially three levels of videodisc sophistication, sometimes known as the Nebraska scale. The simplest home videodisc players , roughly the size and weight of a video-recorder, provide the following facilities: remote control (through a keypad) ; random access to any frame on the disc within three seconds, each frame having an unique number; the possibility of freezing a frame for as long as needed without any damage to the disc; forward and reverse movement at full speed, half speed, or a frame at a time; the possibility of scanning very fast through the disc. The indexes to the videodisc in this case are held on a separate medium, either paper or a computer floppy disc.

The value of this new type of data store is increased if the videodisc player contains a small onboard (internal) microprocessor or an EPROM (externally-programmable, read-only memory). This enables the user to develop the interactive potential in the videodisc by linking a programmable machine with the archival potential of a videodisc.

As well as the basic features of the simple player, there are facilities for branching and for monitoring the performance of the user. A simple program can be written to guide the viewer through the material on the videodisc or to help in simple searches. Such a system, for instance,

would be suitable for some demonstration purposes in teaching, displays in museums and in industrial applications.

A considerable increase in power is achieved if the videodisc is linked (via the RS232 serial port) to a more powerful external computer of the kind which is now becoming standard as a 'desktop micro'. This can now hold the indexes to the videodisc. This first of all enables the user to develop the ideas described in the previous paragraph. Ready-written programs can be written which will take a viewer on various 'walks' or guided tours through the material, providing tutorials on various topics and themes.

Thus a single videodisc can be made to yield hundreds of different 'films' which can not only be on different topics, but at different levels of difficulty for different audiences, and to mix visual, textual and audible information. Copies can be made onto videotape if necessary.

The second possibility is to write interactive programs. Here the viewer uses the computer to make choices in response to questions and these choices affect subsequent viewing. Through the use of 'loops', that is the repetition of sections of a program, it is possible to make sure that the message is understood. Through the idea of 'branching', or diverging tracks through the material, the viewer can control whether he or she will move in one direction or another. The level of instruction and comprehension can be altered as appropriate. This provides a learning game or computer aided instruction which is enriched by the addition of visual and sound materials.

A third possibility is for viewers to explore the videodisc themselves, using the normal searching capacities of a computer and a conventional database package. With tens of thousands of separate visual and sound records on the videodisc, it is indeed only possible to explore different themes quickly if one has some form of computerised index searching. With such a standard database package, it would be possible to build up an index of key terms and to search the descriptions of pictures and sound in order to find those which matched a query.

A new dimension is added if we consider the videodisc as only one among several databases. It may be closely associated with a textual database, thus changing the system into a mixed optical and textual database. As with the BBC Domesday videodisc, a great deal of background textual and possibly statistical material can be accessed by the computer, either on the videodisc itself, or on some other form of large store, such as hard disc or compact disc. For instance, the detailed documentation relating to the pictures on the disc may be contained in the letters, diaries, notes and books of those who took them. These need to be made available to make the pictures meaningful, and in turn the pictures are needed to give meaning to the texts.

The addition of many thousands of pages of textual information to the tens of thousands of visual images puts new demands on the retrieval system. Unless it is powerful, fast, flexible and caters for human intuitional and associational reasoning, it will be impossible to make full use of the new possibilities emerging from this very recent union of developments in laser, video and computer technology.

Already videodiscs are being used in many different ways. Here we will merely mention three educational uses. One of these is in terms of archival storage. Because of the perishable nature of early film and photographs, as well as of old objects and manuscripts, many curators and archivists have been looking for a medium which will store representations of various materials more effectively. The durability, compactness and rapid direct access, makes a videodisc based system attractive for all those with collections of 'records' , whether photographs, films, books, manuscripts, or objects.

Among its attractions from an archival perspective is the fact that the videodisc makes access to reserve collections possible for researchers and the general public. Exchange of information

between institutions will become feasible, including sending copies of the very large collections now in western countries to the Third World countries from which the collections were made. Museum security can be increased by having a photographic catalogue of the collection. The cost of reproducing visual and textual information is dramatically reduced. Just as microfiche and microfilm reduced reproduction costs by factor of over ten, this format reduces such costs again by a factor of another ten to fifty times, depending on the materials.

In relation to teaching and instruction, there are also very considerable potentials which are rapidly being explored. A videodisc system can be used at any educational level in either public displays or in schools and universities. Devising programs from the data teaches a number of skills to the program maker, and the finished product can be used in class or display. As a central resource in a school or university, for instance, it would enable teachers in a number of disciplines to make up programs for different purposes. In a museum it would be possible to provide a series of different short programs which visitors could select, as a background to the exhibits.

As far as research and the deepening of knowledge is concerned, a videodisc database makes it possible to collect together and store in an accessible way many of the materials now scattered in different locations, giving the researcher instant access to them. This makes it possible to undertake detailed research of a kind that has hitherto not been feasible. A videodisc system gives the ability to move at will, with direct access, through information of a visual, textual and audible kind. Frame by frame analysis, enhancing images with digital programs, examining film in slow motion, the juxtaposition of visual and textual materials, now becomes possible in the context of very large collections. The limits become those of human interest and ingenuity, rather than the accidental location and availability of information.

CHAPTER TWO. **THE NAGAS; AN INTRODUCTION**

The recording of tribal civilisations; the Nagas.

There are four major types of human society: hunting and gathering, tribal, peasant and industrial. For most of human history, hunting and tribal societies were the only ones in existence. Today very few such societies remain; most have been totally destroyed during the last hundred years.

The recording and understanding of these alternative social systems are important as a corrective to the assumptions of our industrial society. The destruction of such societies has been so rapid that little has been salvaged, and the few records that survive are rapidly dwindling: the photographs and manuscripts are deteriorating and those with personal experience are now elderly.

This videodisc seeks to develop one way to reconstruct and preserve some of these precious records and to make them available for present and future generations.

One of the few areas in the world where acute observers have documented, over a period of more than a hundred years, the workings of an assembly of tribal societies is on the north- eastern frontier of India. These involve the British contacts with the so-called Naga tribes of the Assam-Burma border.

In many ways the Nagas, who numbered about half a million people at any one point in the period covered by this videodisc, are representative of the forest dwelling tribesmen who once inhabited large areas of South-east Asia, the Pacific, South America and Central Africa.

A combination of circumstances has given us a particularly rich record of Naga culture. Firstly, the precipitous mountains and thick forest, as well as the warlike head-hunting reputation of the peoples deterred outsiders from entering the area until very late. The period of contact, starting effectively in the 184Os, was unusually gradual, lasting over a century until Indian Independence in 1947.

It was only with the Second World War and the combined influence of missions, education and economic growth that the situation changed profoundly. Little research has been possible in Nagaland since 1947, and the bulk of the material on the present videodisc therefore relates to the period up to that date.

Thus we have for the Nagas a series of historical records spread over a century, each analysing aspects of a set of tribal societies sufficiently isolated to maintain much of their ancient social systems, yet with a loose attachment to the British Empire. This encouraged outsiders to try to understand the traditional ways of life in order to administer and adjudicate the expanding Empire in the north-east.

The relative lateness of the contact means that the second fifty years of documentation were within the era of photography and the last few years within that of the moving film. The involved interest of the District Officers as collectors and analysts ensured the survival of large numbers of artefacts.

All this provided the context which made study and recording possible, but only good fortune brought to the Naga Hills a series of very gifted observers. These men and women became so involved with the Nagas that they assembled large collections of all kinds of material despite

linguistic and practical difficulties.

Although we are forced to look at the Nagas through alien and outsiders' eyes, over the shoulders of the observers, there is enough material to glimpse a world that has now practically vanished. Here we will try to provide a very brief description of a few of the outstanding features of Naga society as they described it.

A few of the central features of Naga society.

A number of features made the Nagas particularly interesting to European observers. There was first their mysterious history. First mentioned by Ptolemy in about 15O A.D., it was clear that the Naga tribes had only coalesced recently in the patterns which the British discovered. After millennia of wandering, a number of different ethnic groups had ended up in the hills of the Eastern Himalayas.

Strange coincidences of culture and language through the Pacific led some scholars to suggest that the Nagas were an off-shoot of groups which had originally descended from the central Asian plateau. Their burial customs, ornamentation, agricultural practices and even games and crafts, linked them strongly to the tribal peoples of Borneo and the Philippines. Here was a culture which might provide clues to some of the great migrations in human history.

Equally intriguing was their contemporary material culture. Like many tribal groups who practice the labour-efficient methods of swidden (slash and burn) cultivation of rice, the Nagas had a great deal of leisure, and large surpluses of grain. They used this to develop an elaborate and beautiful world in the forests.

They were expert craftsmen and artists, making their social and cultural patterns explicit through ornamentation and display. Through colour and pattern in their material culture the Nagas revealed their social and ritual status.

From the earliest period of contact, visitors were struck by the Nagas' carved and thatched houses, woven cloths and wooden carvings, distinctive hairstyles and body tattoos, and their songs and dances.

European attitudes were more mixed about other aspects of Naga society. Nakedness, youth dormitories and a relaxed attitude to sexual experimentation aroused more ambivalent reactions. Yet by the turn of the century their uninhibited way of life, their physical attractiveness, and their personal loyalty and frankness, had won the hearts of many observers and administrators.

It had not always been thus. The antipathy of the Nagas to the colonial expansion of the British resulted in an Angami Naga rebellion in 1878. The suppression of this revolt was followed by the expansion of the 'administered areas' (where Nagas paid taxes and supplied labour) in the 2Oth century. But the development of British 'indirect rule' and its pragmatic tolerance perhaps explains why by 1944 many Nagas opted to help the British in repelling the Japanese advance into India.

Other features of Naga society also attracted attention, including their political systems ranging from autocratic chiefs to almost pure democracy in neighbouring tribes, and their ecological adaptation to a harsh terrain. In the elaborate terraced rice cultivation of the Angami Nagas and the shifting cultivation of most of the other Naga tribes, it was possible to see traditional systems of agriculture in undisturbed operation.

One had some picture of how men must have lived in forests over hundreds of thousands of

years. Each stage of the agricultural operation and its close interweaving with ritual and taboo was noted by the observers.

Two outstanding features of the varied cultures particularly drew attention, the Naga concern with death and with the human skull.

Although exuberantly alive, what gave real meaning to Naga society was death and the manner of dying. Despite the absence of written records, through myth and particularly in material memorials, the names and deeds of ancestors were to be remembered.

Most dramatically, this was done through the erection of massive stones, dragged by teams of villagers through the jungle and erected as the culmination of grand 'feasts of merit' to celebrate the power and deeds of great men. The world which was only vaguely remembered in the standing stones of Europe or the Pacific was still alive among the Nagas.

All of Naga life had its ritual aspect: all activities, from simple household and economic tasks up to dancing and feasting, had a mystical or religious significance. The spirits which controlled the realities of Naga life, disease, human and crop fertility, rain, needed constant attention.

The human head, the seat of wisdom and the human soul, was the repository and conductor of power. This was true, irrespective of whether the head was that of a child, a man, a woman, alive or dead. He who owned another's head gained prosperity in this world, the esteem of his fellows, and a guaranteed happiness in the after-world. The best way to own a head was to take one by force.

Forest tribal peoples, for instance the peoples of New Guinea or the Amazon, are often very war-like. To seize the wealth and labour of other groups is a more congenial way to affluence and power than by hard work in agriculture. There is no political organisation above the level of the clan or village to prevent war.

In this world of a war of all against all, the Nagas added the ritual importance of head-hunting. Life was given its central purpose by the quest for heads. Boys would not become men without the ritual tattooing only to be undertaken after a successful head-hunt; girls would not be attracted to men without the splendid head-hunting dances and decorations. Success and merit in every field depended on heads.

This presented administrators and anthropologists with one of their major challenges. By the turn of the century, they were well aware of the logic of the system and could recognise that if head-hunting were rapidly abolished (as it had been in other parts of the Empire) it would be the equivalent of destroying money, markets and the profit motive in a capitalist society. There would be little point to life any more.

Yet the western conscience could not condone the cruelty, nor was the 'pax Britannica' very plausible in a world of almost ceaseless feuding. So the observers tried to study, modify and re-shape the institution, while the Nagas tried to incorporate the observers into their world.

The mutual relations between these strikingly different, yet admiring and basically tolerant points of view, run through the literature. They pose the broadest questions concerning ethical relativism, the preservation or destruction of alternative modes of thought and deed, the rights to interfere. These problems were exacerbated by the growing number of Christian missionaries in the hills who were trying to convert the Nagas from their supposedly 'heathen' religion, morality and social customs.

Out of this conflict of two civilisations based on entirely different premises there came

thousands of images and descriptions of the Nagas. This videodisc gives access to many of those images. Since Independence in 1947 there have been great changes and only a part of what is represented here has survived.

CHAPTER THREE. COLLECTORS AND OBSERVERS.

The "military" phase of observation.

Since we cannot visit Nagaland and in any case the period covered by this disc is long past, we are forced to look over the shoulders of others who lived and worked in Nagaland. We see the Nagas through the necessarily distorted mirror of European visitors.

Over time, it is possible to divide this observation into two broad and overlapping phases.

The first phase (1832 to c.1880) might be termed "military", in which initial contact was dominated by an attempted pacification in the face of an unorthodox resistance by the Nagas. In this phase, where the Nagas represented an unexpected obstacle to the smooth expansion of British political power and economic interests (principally tea), the potential for ethnographic description was limited.

The Nagas, who had achieved equality with neighbouring valley Hindu kingdoms, did not always accept the British presence willingly; while their institutionalized violence and lack of over-arching political organization, made British control difficult to effect. Yet by the end of this phase a significant body of descriptive writing by surveyors, soldiers and administrators had been built up.

The writing was on occasion patronizing and, to the modern eye, racist, and it emphasized the obviously exotic features of Naga society, such as head-taking. But its descriptive thoroughness, in questions of dress, ornamentation, and house-building (features which seemed to make it possible to identify different groups or even tribes), raised the key question which still informs Naga studies: are the Nagas one people or many ?

The "administrative" phase of observation.

The second phase, which we might call "administrative", saw overt military control largely replaced by a policy of indirect rule through administration. Within the (ever-expanding) administered area, the British guaranteed peace, while setting up structures of courts, schools, taxes, headmen and labour obligations; outside the administered area the British practised non-interference, except where raiding threatened administered villages or valley tea estates.

This policy of non-interference necessitated a need for the most thorough knowledge of the people concerned: their indigenous laws and kinship systems, the demands of their ritual observances, their understanding of social status, their relations with their neighbours, their economy and systems of ownership. The variations in these matters between groups of villages, were studied intensively, often under the influence of the then current theories about migration and social evolution.

It is for this reason that the administrative and ethnographic projects were parallel, and indeed the ethnographic monographs of the 1920s doubled as administrators handbooks. The naming of the separate Naga "tribes" (largely on the basis of material culture and language) was effected by this stage: although a British way of seeing things rather than a Naga one, this classification continues to be important in Nagaland, which since 1962 has been a state within the Republic of India.

The Naga videodisc particularly features the work of six individuals, from different points in this long process of contact and interaction.

Colonel R.G.Woodthorpe

Representative of the early imperial, expansionist and military phase, is Colonel R.G.Woodthorpe. Col. Woodthorpe began survey work as an Assistant Superintendent in 1871-2, working in the Lushai Hills, and subsequently in the Garo and Naga Hills. His 1882 lectures on the Nagas remained a standard work for many years; he illustrated his own writings with some fine drawings.

As the administration became more settled, District Officers were appointed: their on-the-spot experience was held to be essential to the project of indirect administrative rule.

Dr. J.H.Hutton

Dr. J.H.Hutton, later Professor of Social Anthropology at the University of Cambridge, served in the Indian Civil Service from 1909 to 1935, almost entirely as an administrative officer in the Hill areas of Assam. He was involved, as a magistrate and taxation officer, in a practical way in Naga life. He recorded in detail their customs, languages and social organization. He did this both for posterity and, as he saw it, to make it easier gradually and non-coercively to integrate this culture into the British Empire.

Through the encouragement of the Curator of the Pitt Rivers Museum at Oxford, Henry Balfour, Hutton began systematically collecting and documenting artefacts for the museums at Oxford, Cambridge and elsewhere. He also took a large number of still photographs, made some early wax cylinder recordings from 1915-19 and took the copious field notes upon which his lengthy and detailed monographs on the 'Angami Nagas' and 'Sema Nagas' were based.

J.P.Mills

Hutton was followed by an equally talented administrative officer, J.P.Mills (1890-1960), later Reader in Anthropology at the School of Oriental Studies. Educated at Winchester, Mills served in the Naga Hills between l916 and 1938.

Inspired by Hutton, by a similar friendship with Balfour and by his deep affection for the Nagas, as well as the practical necessity of advising and arbitrating, he collected and analysed with equal energy. On his numerous trips through the administered and un-administered areas he documented the Naga way of life as fully as he could. He added to and complemented the collections of artefacts, particularly in the Pitt Rivers Museum, Oxford.

As a result of the combined efforts of Hutton, Mills and Balfour the collections of material culture artefacts for this relatively small and isolated group of tribes constitutes one of the finest tribal collections in the world, and undoubtedly the finest in the Pitt Rivers Museum. The collection is also superbly documented, with details about the use and origin of most objects.

Mills, like Hutton, was a keen amateur photographer and the joint collection of their early photographs comprises about 1500 plate glass slides or negatives. Mills' ethnographic observations resulted in three lengthy and detailed books on 'The Ao Nagas', 'The Lhota Nagas' and 'The Rengma Nagas', as well as numerous articles, constituting some two thousand pages of very careful documentation of these groups. Unfortunately, only a little of his unpublished materials in the form of letters and diaries, have survived.

Hutton and Mills are representatives of the colonial officer combined with anthropologist. A

fully trained and talented example of the new professional anthropologists appeared in the Naga hills in 1936 when Christoph von Furer-Haimendorf arrived to study the Konyak Nagas.

Christoph von Furer-Haimendorf

Born in 1909 and educated in Vienna and London, Furer-Haimendorf was for many years Professor of Anthropology at the School of Oriental and African Studies. He was the first in the Naga Hills to live for months at a time practising the new form of 'participant-observation' fieldwork in a single small group of villages. He learnt the language, went hunting, fishing, planting, weeding, dancing and feasting with his co-villagers.

While interested in the comparative and theoretical problems of anthropology, he also wished to understand and then convey what it must feel like to live in a Naga village, to start to interpret Naga culture from the inside.

The feelings, thoughts and interconnections of Naga society fascinated Furer-Haimendorf and he set out to document and bring back as much information as possible about this very alien world. He wished to translate this culture into terms that were comprehensible to a European audience. He tried to do this in four ways.

Firstly he used the written word. In the field he kept very detailed diaries totaling about two thousand hand-written pages, covering one year, and in fifteen notebooks a parallel set of more detailed notes, genealogies and house lists. On the basis of these he published the evocative 'The Naked Nagas' , a short anthropological work on the 'Konyak Nagas' and a series of articles.

Secondly, he added to the collections of artefacts started by others. Thirdly, he made about five hours of moving 16mm film, both black and white and in colour. As a movie camera was not available during his first fieldwork, Furer-Haimendorf returned in 1962 and 197O to make these films, at a time when the Naga hills were closed to all other foreigners.

Finally, he was an energetic and accomplished photographer. There remain over two and a half thousand black and white 35mm photographs (as well as some later colour photographs) of his year among the Konyak Nagas. Using a Contax camera fitted with a telescopic lens, he was able to capture with unusual intimacy the life around him.

Ursula Graham Bower

A few years after Furer-Haimendorf, but working at the other end of the area among the Zemi Nagas of North Cachar, was Ursula Graham Bower.

Born in 1914 and educated at Roedean, she first visited a friend in Manipur in 1937 and then spent some seven years living among Nagas between 1938 and l945. For long periods she was without European company and was faced with the advancing tide of Japanese invasion during the Second World War. She immersed herself in the culture and language and even led a small section of 'V' force irregular troops against the Japanese. Like those before her she sent home material culture artefacts to British museums.

In an unpublished anthropological thesis she made an analysis of the social organization of the Zemi Nagas. In notebooks and diaries she kept a record of her own life and analysed the folklore, language and other features of the southern Nagas. And in her best-selling autobiographical account, 'Naga Path', she tried to convey the experience of a young woman living among the Nagas.

Like Furer-Haimendorf, Ursula Graham Bower was an enthusiastic and gifted photographer. Despite the rationing and disturbances of war, she took over two thousand black and white photographs. She somehow procured a 16mm movie camera and film stock and made a series of black and white and colour films lasting over an hour and a half. These parallel with considerable technical ability her photographs and writings.

W.G.Archer

The final major figure is W.G.Archer, a late example of the colonial officer and anthropologist.

Archer had previously worked and written about the tribal art of middle India. When he was made Sub-Divisional Officer in Mokokchung in l946, he decided to make a study of Naga art with a view to publishing a book. He consequently rapidly assembled over 800 photographs, numerous sketches and notes. He was only able to remain for a year, sandwiched between the devastations of a war which had just finished and the rapid ending of British rule.

His insights were complemented by the detailed diary of his wife Mildred, who kept a diary. Both were to go on to pursue distinguished careers in the Victoria and Albert Museum and India Office Library.

CHAPTER FOUR. **PRINCIPLES USED IN SELECTING AND EDITING MATERIALS.**

General principles of selection.

We now have media (videodisc, compact disc, hard disc) which will hold hitherto inconceivably large sets of visual, aural and textual information. Nevertheless, in practice there is always too little space, time, energy or interest, so that only part of the materials that have survived can be transferred.

We have already described in a preliminary way how the minds and interests of the observers absorbed only a small part of the Naga world into their camera lenses and writings. A second distortion then occurs by the action of history and accidents of storage; a great deal has been lost, or is buried in private or public collections in such a way that we were unable to use it.

Nevertheless, even with these two filters, a very great deal has survived and this has meant that we have had to make some selections from what we have found. Since such a selection is inevitable in any project of this nature and affects the meaning and value of what is available, we may briefly describe the principles of selection in each major type of material.

Photographs

Since there are a finite number of these, and they are of great value, we have tried to include practically all the photographs we have located. Only a few hundred out of the roughly seven thousand black and white photographs we discovered have been omitted.

These were left out on the following grounds: they were duplicates of, or very similar to, other images; their quality was poor; they were outside the delimited geographical area; they were outside our time span; or they fell on the side of "private experience" as opposed to "public experience", in the sense meant by John Berger (**About Looking**, 1980, p.51).

We did not "censor" any photographs because their content was embarrassing or shocking in any way, or might do damage to the reputation of individuals, the British, anthropology as a discipline, or for other such reasons.

This latitude obviously raises important issues, given that the videodisc system is intended for use in a variety of educational contexts.

Many of the images from the colonial era do, after all, portray the people concerned in a way which is objectifying, de-contextualizing, or exoticizing. It is undeniably the case that the camera did contribute to the "normalising gaze", in Foucault's terms, by which a subtle form of power was exercised over others by classifying them and making them visible.

The Naga videodisc does not attempt to avoid these issues, but, rather, hopes through the associated tutorials and courseware to encourage a critical attitude on the part of users to the historical interaction of anthropology and administration.

It must also be said that the antithesis to de-contextualized images is also contained on the disc itself, in the shape of some of the earliest, and best, examples of a recognizably "modern" era of empathetic and contextualized anthropological photography.

Film

There were two problems here. First, we found very little film before 1947; but since film is so important, we decided to break the temporal boundaries and include movie film taken on two visits to Nagaland in 1963 and 197O by an anthropologist who had worked in the area in 1936-7. When we included these, we now had some six hours of film.

One side of a videodisc will hold only 36 minutes of moving film (in interactive mode), and since we needed to allocate at least six minutes to the photographs, we only had about thirty minutes free. This meant that we had to reduce the film at a ratio of 1:12.

We spent many weeks going through again and again, whittling away material, trying to minimize the loss of valuable archival footage. The principles we evolved and acted on were as follows.

The first consideration was the content of the moving images. We tried to include that material which was most intellectually and academically interesting. This is a subjective matter, but includes that material which portrayed events and processes which were most representative, most revealing, most unusual, and illuminated the other still images and texts in the most significant way.

The visual images which were unusual included those which were only preserved in this medium, for instance the eating of dried rats, or a shared joke between anthropologist and Naga.

We concentrated on subjects where movement and action were important, for instance dance, games, postures and gestures, rituals, agricultural labour. If long and repeated sequences of film on the same subject were present, we selected only one or two sequences.

The second set of principles was concerned with form. Taking into account the interest of the content, we rejected badly filmed sequences, that is to say the few sequences which were out of focus, badly composed, unsteady, from too great a distance and so on. We rejected film that was damaged, the colour fading, or otherwise unsatisfactory, unless it was particularly interesting.

We preferred close-up shots of detail in most cases to the wider shots of a more static kind, which could be preserved with one or two selected stills. Close-ups are more effective on the intimate television screen.

In considering the selection for the videodisc, there was one set of factors which gave us a considerable advantage over the person who is undertaking normal editing down from raw film. These are connected to the absolute precise controllability of this new medium.

With normal film, one is constrained to save and knit together reasonably long sequences, five seconds at least, and often three times that length, just to capture the run up to something important happening, for instance an immobile man before he starts to run up to do a jump. Again, the action itself, if it is to be appreciated by the viewer and happens rapidly, may need to be shown at some length, or from several different angles. In other words, a great deal of redundancy has to be built in to normal editing, since the viewer will only see the images flashing past once.

With videodisc the user becomes the editor, master of the medium. One effect of this is that one is not constrained in selecting shots for inclusion on the disc by the usual film conventions, such as keeping the stage line or matching shots

There is a sense in which film that has been shrunk or contracted in the editing process can be

expanded again at the viewing stage.

This is because it is possible to treat each frame in a precise way. One can take just one shot of a view, or non-moving group of people, and hold it as an establishing shot for a number of seconds; if necessary one can easily go back to the start of the sequence and play through in slow motion to explain in detail what is happening, and so on.

In other words, instead of merely cutting a long set of moving sequences into shorter pieces and sticking them in a precise order, one is creating a set of images, some of them still frames, some of them sequences of still frames taken every few seconds, some of them moving sequences.

The boundaries between still and moving films blur, and one is able to abstract precisely a great deal of the visual information without apparently losing much. It should be stressed, however, that there is a different 'feel' as between a frozen frame and a 'still' filmed sequence.

In this way we created out of six hours of film approximately one hundred and fifty moving sequences, each lasting between three and about twenty-five seconds, the average being about eight seconds. We also abstracted about one thousand "stills" taken out of moving sequences where there was little movement, or randomly every few seconds to capture a series of events, for instance transactions in the market.

Artefacts

Here there is again a problem of selection. There are known to be well over fifteen thousand Naga artefacts in European museums and private collections, at least twelve thousand of them in Britain.

To have located and photographed them all would not only have absorbed much of the effort of the team, but the final photographs would have used up over a quarter of the total space for visual images on the videodisc. It would also have given, in some artefacts, hundreds of almost exact duplicates.

One general criterion was accessibility. That is to say we confined our work to certain major private and public collections in England, though we knew of others in other parts of the British Isles and Europe, not to mention America and, of course, India and Nagaland itself. From the brief descriptions of other collections, it did appear that we were able to see and select a fairly representative sample of artefacts.

Within the ten thousand or so artefacts which we either examined in themselves, or through catalogue descriptions, we used a number of criteria. We sought a representative selection, in terms of the types and functions of artefacts and their origins in different Naga groups.

We attempted to use Naga criteria of significance rather than our own-that is, to ensure the chosen artefacts did reveal the key features of Naga social structure and belief (status, head-taking, kinship organization and so on).

Where there was duplication, we tended to choose artefacts with superior documentation, and left out those where the condition of the artefact was very poor. We sought to photograph as many nineteenth century artefacts as possible, on the grounds of their rarity.

Such artefacts also were crucial in throwing light on a key research interest - the colonial encounter. What can we learn from the types of artefacts collected, about how the Nagas were perceived and classified as the colonial era developed?

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We also bore in mind the need to photograph artefacts which would be interesting from a comparative perspective - for example, artefacts indicative of trade amongst Naga groups or between Nagas and neighbouring peoples; artefacts bearing strong resemblances to other South East Asian hill tribes; artefacts which, when compared with others, revealed continuity or change over time.

We emphasized artefacts which we knew would tie in well with other material on the disc, such as artefacts collected by administrators or ethnographers whose writings feature prominently in the textual database.

We sought to ensure that mundane, everyday items were as well represented as the more exotic and aesthetically exciting artefacts. Where there was obvious interest, we photographed from two angles, but constraints of time and difficulty in placing artefacts left this task incomplete.

Paintings and sketches

Here there was relatively little difficulty with selection. Since the absolute number was not great, in the hundreds, we included all those pictures which we thought could possibly be of some interest. Many very simple line drawings were included when they tied up with textual descriptions, and only very occasionally did we leave out an illustration because it duplicated something else or was so minor and badly documented that it seemed confusing to include it.

Sound

The 72 minutes of sound data included on the two tracks of the disc, are an attempt to provide very different kinds of data. We sought to combine recordings of a time breadth to match the photographs. Thus we included early wax cylinder recordings (1919) and present-day (1987) recordings of songs, with their considerable Christian influence. Examples of several kinds of instruments have been included, such as drums, jew's-harps, stringed instruments, as well as singing. Field recordings of conversation (1970) have also been included. This is referred to as 'sound' in the indexes.

Maps

We had hoped that we would merely have to photograph the various maps of Nagaland from the earliest times up to 1947, including the very detailed Survey Of India maps of c.1910-1945.
However, when we experimented with the maps by looking at photographs of the ordnance survey maps on the screen, we discovered that this was impossible. However much we magnified the maps by photographing them in tiny sections, the mountainous nature of Nagaland meant that all we could see were blurry pictures of contour lines, with the odd village name, almost unreadable, dotted among them.

We found therefore that we had to re-draw the maps, ending up with 165 sketch maps on the videodisc. All contours were left off, but otherwise they included rivers, major mountains, borders and the location and names of some 1400 villages and towns which were mentioned in one or more of our photographic or textual sources. The maps were mainly based on the 1:2 Survey of India maps of the area.

All maps and mapping were subject to considerable errors, compounded in this case by the difficult terrain, the shifting character of many Naga villages and the immense complexity of

village names, which can vary radically from author to author, or even within the same author.

The maps are therefore, very much to be thought of as sketch maps. They form the basis of "map-walking" software, developed for the project, which allows the user to move north or west to the next map.

General principles in selecting texts.

The selection of texts was done with two overall considerations in mind, which relate to the innovative nature of Interactive Video as a technology.

The system can be thought of as essentially an archive, in which case one would probably wish to exercise fairly limited editorial control; on the other hand, it is also a teaching resource, and in this sense does require some attention to including material which is likely to be of use in diverse educational contexts.

The main problem here is not so much one of total available space, but of the effort of data entry.

It will not be long before standard microcomputers have hundreds of megabytes of storage available, so there is unlikely to be a long-term difficulty in holding materials. Yet if we consider the labour not only of inputting material, but then of checking it and indexing it very precisely to make it useful, it becomes clear that unless one has very large funds and a team of workers over a long period, one is bound to reach the limit of what can be fed into the computer.

In effect, if we add up all the different parts of people's lives that have gone into this project, it is probable that we had the equivalent of five or six person-years of human labour available.

Thus one has to select from the surviving materials. A few of the broader principles of such selection need to be mentioned.

Firstly, we have concentrated, with the major exception of one very long diary in German, entirely on texts in English. Perhaps a tenth of the writings on the Nagas before 1947 has thus been excluded for consideration. Secondly, we have tended to concentrate our efforts mainly on the period between about 1910 and 1947, leaving the nineteenth century more selectively treated.

Thirdly, we have directed much of our efforts to the more intimate and detailed accounts by specific individuals whose visual materials are available on the videodisc.

Major textual collections in the database.

Thus we have attempted to collect and put into the computer all the relevant surviving materials of R.G.Woodthorpe, J.H.Hutton, J.P.Mills, C. von Furer-Haimendorf, Ursula Graham Bower and W.G.Archer. Added to these are smaller collections from other twentieth century authors.

For the nineteenth century we have only selected a few texts, for instance part of the ethnographic survey by Dalton, the diary of Godwin-Austen, Woodthorpe's papers and some manuscripts of Colonel J.Butler.

At present, the gaps are as follows. Of the several hundred

articles written about the Nagas between 1832 and 1947, we have only included a few. Secondly, as far as the official records are concerned, we have only sampled a few of the very extensive files. We have included a file on a military expedition, a gazetteer, some official reports.

Since the technique we have used is deliberately open-ended, it will always be possible to incorporate more of the materials which undoubtedly exist in the India Office Library and other archives both in Britain and India. Little use was made of missionary archives, or of materials on Burma.

Omissions and editing.

This summary describes the major editorial decisions, to include or exclude a whole class of documents, or whole lengthy text. There are more subtle ways in which one is forced to edit documents, however.

As far as internal editing of texts is concerned, we have only applied two rules. If the material is likely to cause personal offence or political embarrassment to living persons, we have omitted it. In all the files we have included, this has led us to omit probably less than a couple of pages of material.

Secondly, if the material is repetitive or apparently trivial and of only personal interest, we have omitted this.

With regard to the actual materials, we have occasionally corrected spelling or minor grammatical errors which obscure the meaning, but otherwise we have not changed the documents. The fieldwork diaries of Professor Furer-Haimendorf were especially translated for us by Dr Ruth Barnes, an anthropologist and native German speaker. They were checked for accuracy by Professor Furer-Haimendorf.

CHAPTER FIVE. METHODS USED TO TRANSFER AND STORE THE DATA.

Film.

We reckoned that about 6 of 8 available hours of film would be of interest, and should be included on the disc in full or in "compressed" form. The original film was copied to high quality videotape, in the process one copy receiving a burnt-in "time code", which allowed us to watch the tape and decide exactly which parts we wanted to include on the edit master video-tape.

In addition to making time-coded versions for our editing use, the production centre provided the professional skills of edit suite operators to do the editing work of putting the desired clips onto the EM videotape. In our case this was extremely complicated, because it involved not only relatively long sequences of film, but also up to a thousand "random" edits (taking, say, one frame in every 25, to give an idea of what was going on in a sequence without including it in full). If very complicated editing is being done, extra care must be taken to ensure that the field dominance selected is absolutely consistent throughout or else the possibility will occur of "jumping" frames appearing on the videodisc.

Sound.

This came in various forms, old 78 r.p.m. gramophone records, wax cylinders, reel to reel magnetic tape, modern cassettes and high quality quarter inch magnetic tape. All had to be transferred onto the quarter inch tape. Most of this was done within the Audio Visual Aids Unit in Cambridge, though the wax cylinders had to be copied at the National Sound Archive, London. There are two sound tracks on the videodisc so it was necessary to be selective, but there were few technical problems. There was no usable synchronised sound and film so there was no need to plan the sound with this constraint in mind.

Original photographs.

As is common with many historical photographic projects, the images we identified in various collections existed in diverse forms; from glass-plate negatives to modern colour prints. These all had to be transferred to a single medium.

In the case of negatives, we decided that re-photographing as transparencies would be far too expensive at the tele-cine transfer stage (given that there were 8000 or so individual images). One option considered was to use a 16mm film camera, mounted on a copy stand above a flash light source, through which negatives could be fed. This arrangement was mechanically quite complicated, and it proved difficult to focus adequately on the image.

We decided instead to use a half-frame camera mounted on a Bowens "Illumitrans" copier. The Illumitran allowed for some correction of light balance with each negative, in some cases making it possible not only to copy but also to improve on the quality of the originals. The half-frame camera altered the direction of the images. Instead of producing images on the film lying lengthwise, they were inverted through 90 degrees, to lie across the film and were reduced to about two-thirds of the usual size. In effect, this produced a short roll of film which had the images lying in exactly the same way as a movie film. Indeed, one could produce short strips, of usually about 6O exposures, of 35mm movie film.

These strips could then be spliced together to create a single reel of 35mm film, with the images of roughly TV-aspect ratio, easily transferable to video-tape. We used reversal film to

copy negatives, which produced high grade positive images when developed. We were able to do our own developing of these films, substantially reducing the costs.

In the case of positive images (in our case, photographic prints, pencil sketches, sketch maps), we used the half-frame camera (with ordinary transparency film) mounted on a regular copy-stand, using either an electric light source or daylight. The strips could then be spliced together, as described above.

A specific problem which it is impossible to overcome arises from the shape of the television screen, that is, its 3:4 aspect ratio of height to width. 'Landscape' negatives are close enough to the aspect ratios of television to need only a little pruning at the edges. But 'portrait' or upright originals are bound to come out oddly on the TV screen. Here we exercised our judgment in the re-photography. If only a part of the portrait is relevant, one can go up close and fill the screen. But in many cases it was impossible to take off much at the top or bottom, and consequently the image will only occupy the central two thirds of the screen, with subsequent loss of detail. We decided to leave roughly equal (white) borders on each side.

As for re-framing the landscape photographs, we did a certain amount of this if there appeared to be parts of the picture which contained most of the visual information. In general, however, we tried to be careful not to change the image too much, since the original composition in itself may be important for future analysts. It was important to bear in mind, however, that TV will always tend to crop images, unless they are very carefully taken within the viewfinder's "safe" area. On occasions we bracketed two shots together, as "whole" and "detail". Where we were unsure about the copying of very old or otherwise difficult images, we shot two or three times, at different exposures; but (as explained below) it may prove impractical to edit out the unwanted versions.

The half-frame method has a number of advantages. But there are three potential hazards. One is that if a single mistake is made in the splicing, the entire reel after that point will be "out" by that amount, and the resultant videotape master will be useless. The second arises from this need for care with splicing.

For non-specialists, the less splicing, the better. Therefore, it becomes inadvisable to think about "splicing out" all your faulty images, which will doubtless figure here and there in the half-frame film strips. The resulting videotape will, therefore, include your "mistakes" and indeed your codes for where the constituent strips begin and end (without these, it may be difficult to relate any individual picture to its index record when it appears on videotape and ultimately on videodisc). "Mistakes" will of course be "edited out" to some extent in the system software (that is, query-based searching will never take the viewer to a faulty image); but random flicking through the disc with a keypad will mean that users will see mistakes from time to time.

Third, attention must be given to accurate centring of the images. In many cases (e.g. landscapes), this may not be important, but where single objects or portraits are concerned, it is as well to anticipate a possible slight "left bias" in the tele-cine process. That is to say, the tele-cine process expects the left side of any film strip to contain a sound track. This will of course not be the case with half-frame film. But potentially this means that the tele-cine process only scans 90 per cent of the film width, missing out the 10 per cent of "audio" to the left, which in our case is very much part of the picture.

The effect is that, as is visible in our disc, the "true" centre of the original film appears to be shifted by ten per cent to the left on the videotape (and therefore on the videodisc). To anticipate and correct this possible bias, it is essential either to ensure that full-width scanning will be available to you, or else to centre the original photographs ten per cent to the right of true centre, when you look through the view-finder, and to ensure that nothing of value remains within the

left ten per cent area.

Artefacts.

Our project first concentrated on material culture objects from the Naga Hills. This is the only part of the disc featuring original new material photographed by the project. Some of the earlier images on the disc relate to the period when we were developing the technique and remain somewhat unsatisfactory.

We were advised to use natural daylight as far as possible, and we did so in almost all cases. The exception were a few very large artefacts which could not be moved outside or properly lit by daylight. We also decided that, since our aim was mainly to provide a neutral and precise record of the artefacts, we should try to take them all from a uniform angle. This was almost always from above, using a copy-stand set-up. The exceptions were the few artefacts which because of their shape or size could not be photographed thus. We photographed against a variety of backdrops which we made. It is essential to anticipate cut-off during later stages of the transferring process, and therefore to frame the object in the view-finder within the "safe area", leaving a generous border.

We tried to take a photograph of the whole artefacts from the top or front, as appropriate, with extra photographs of other angles or details or close-ups using a macro lens, if this seemed necessary. We decided to keep out measurement rulers, but measured each object so that the information could be available in the index entry about the image.

These colour slides were then transferred by the process described below, with "tariffing" (colour balancing), to videotape. Depending on the nature of the objects, the logistical problems in the museum or archives we were working in and the number of persons working, it is probably roughly the case that with some help from the curators in searching for and getting hold of the artefacts, two people working together could photograph and index between twenty-five and fifty objects in a full working day. (This was working under pressure, with relatively portable objects, and assuming no hitches. The desired quality of the end product will of course also affect this calculation.) These colour photographs were developed by the University of Cambridge Audio Visual Aids Unit, while the black and white half-frame photographs were developed by one of our team.

Transferring black and white photographs to master tape.

At the BBC Enterprises Centre, we arranged to have our long reel of half-frame film transferred to c-format videotape. A trade-off had to be made, between target quality and cost. It is perfectly possible to have each frame checked ("tariffed") for colour and contrast and for considerable changes to be effected, improving the quality of the originals. But this would cost a very great deal of operator's time (at £80 per hour). Instead, we opted for "batch" control, by which a certain amount of checking for colour and contrast was done for a series of photographs at a time.

It is at this point that the original quality of half-frame photography matters. Batch monitoring will only be of much use if the half-frame photography is done carefully enough to produce a fairly uniform standard of image, without wide variations of brightness and contrast. If there is little tariffing to be done, this process is remarkably fast: transferring from film to videotape at 25 frames per second (standard moving film speed) means that 8000 frames will take about 6 minutes. It also appears to be the case that relatively minor adjustments in exposure in the tele-cine process for colour images produce a larger difference in the final videotape rendition

than is the case with black and white images.

Transferring colour slides to master tape.

By choosing slide transparency for our photography of museum artefacts, we allowed ourselves the option of slide-by-slide colour monitoring to improve quality during the process of transferring to 1-inch c-format tape. This process involved some very time-consuming mounting of slides (in our case, about 1000) in special individual mounts and racks, and was also expensive in terms of an operator's time. A slightly less expensive version of this process is available, in which the transparency film is fed in as continuous strips (i.e. not individually mounted), but this does not allow individual frame colour control.

Pressing the videodisc.

The production centre not only assembles the above material onto the EM tape, but also includes credits and title (if any) and standard audio and video test signals and lead-in and lead-out tape, after which the EM tape can be sent to the disc pressing plant. At this stage, we opted to produce a "check disc" made in essentially the same way (i.e. an acrylic, PMMA, coated with a layer of aluminium) but with slightly cheaper materials, and most suitable to one-off production rather than large numbers. It is much less robust than standard laservision videodiscs.

This allowed us to check the disc and determine if there were any errors. This proved a valuable exercise, since certain errors were indeed discovered, which we could then correct, and it allowed some new material to be inserted at the end of the disc. We had this check disc made at Gesco, Paris; the process took an hour. The quality is undoubtedly inferior, particularly on the first part of the disc, and users thinking of using only this cheaper process should try and ensure that moving film rather than stills appear on the first part of the disc, so the loss of quality will be less obvious.

Once satisfied that corrections to our edit master had been made properly, we then pressed 100 copies of the disc at Telemedia (West Germany), mainly on the grounds of slightly more competitive rates than the other European producer, Philips (Netherlands). The turnaround is in theory 3 weeks. The fact that errors were corrected and additions made, before pressing this final disc, necessitated considerable and non-uniform changes to our database numbering of records.

Textual materials.

The transfer of the textual information is a very long and time-consuming business but compared to the videodisc transfer, the methods are relatively simple and well-known. The printed books which were of sufficiently high quality to be scanned by a computer were fed in by optical character recognition methods. It was a relatively slow process to input about 3000 pages of text, which all had to be carefully checked, since the computer found it difficult to distinguish certain letters, for instance i and l. Nevertheless, it was much less of an effort, and much cheaper, than typing in the material. It worked out at about twelve pence a page.

The rest of the material was either in manuscript form, or the printing was too poor for present scanning devices. This was typed in using conventional word-processing packages and data entry methods, over a three year period. Often the manuscripts were very faded, sometimes jumbled in content, excruciatingly badly written, or presented other difficulties. One key text of over 15O,OOO words had to be translated from the German. The texts were then held for editing, indexing and later dissemination on the Cambridge University Mainframe computer, both on disc and backed-up onto tape. This will finally constitute a textual database of between six and eighth thousand pages of information, including indexes; between thirty and fifty megabytes on

the computer hard disk.

CHAPTER SIX. AN OVERVIEW OF THE CONTENTS OF THE VIDEODISC.

The videodisc contains a selection of images of different kinds. Here is a preliminary overview of the types of material on the disc, with an accompanying 'map' of the videodisc showing where the various materials are.

There are some 135O colour photographs of selected ethnographic artefacts from the Pitt Rivers Museum in Oxford, the Museum of Mankind, London, the Museum of Archaeology and Anthropology in Cambridge and other public and private collections. These include photographs of a selection of weapons, tools, ornaments and textiles. These can be located as 'artefacts' in the accompanying videodisc map, and cover the period from about 1870 to the present day.

There are copies of some 4OO drawings and paintings between the 1847 and 1947 taken from diaries, fieldnotes, printed and other sources, varying from full colour portraits to small sketches of a decorative pattern. They include designs, patterns, human faces, house types, flora and fauna. They are labelled 'sketches' in the videodisc map.

There are 165 maps specially re-drawn for the videodisc. These indicate the position of more than a thousand villages, towns, rivers and mountains in the Naga area which are referred to in texts and pictures. These are indicated as 'map' on the videodisc map.

There are about 7OOO black and white, and a few colour, photographs from the 188O's to 1948. These cover all aspects of Naga life, art, architecture, crafts, rituals, sport, family life, marriage, war, head-hunting, agriculture, fishing, colonialism and many others. All major sub-groups of the Nagas are covered. They come from public archives and private collections and are referred to as 'photographs'.

There are over 15O sequences of moving film and another thousand or so still frames extracted from 16mm colour and black and white moving film shot between 1938 and 1970. These cover music and dancing, war and head-hunting, the agricultural cycle, fishing, arts and crafts, body decoration and tattooing and many other topics. They are referred to as 'film'.

Finally, there are 72 minutes of recorded sounds from Nagaland, from wax cylinder recordings made in 1916 to some contemporary devotional music. The sound of various instruments, such as drums, jew's-harps, primitive string instruments, as well as solo and communal singing by men and women, illustrate some features of the musical culture of the Nagas.

A brief table of contents, or 'videodisc map', in sequential order, is given here.

Frames   short description

1-13   titles and credits

14-1325   artefacts: colour photographs of museum artefacts,
        some sketches, field photographs, paintings,   photographs of plants

133O-7418   films: 'The Man Who Hunted Heads', TV film by
        Christoph von Furer-Haimendorf; colour, 1970

7419-1OO5   films: of Wanchu Nagas, by C. von Furer-Haimendorf,
        1962; black-and-white

10006-22184 films: of Zemi and Tangkhul Nagas, by U. Graham   Bower, 1938-45;

colour

22185-25199 films: of Kabui and Tangkhul Nagas, by Ursula Graham Bower, 1937-40; black-and-white

25200-26251 films: of Kabui and Tangkhul Nagas, by Ursula Graham Bower, 1937-40; colour

26252-43164 films: of Zemi and Konyak Nagas, by Christoph von Furer-Haimendorf, 1970; colour

43165-46122 films: of Wanchu and Konyak Nagas, by Christoph von Furer-Haimendorf, 1962; colour

46123-46331 photographs: stills from von Furer-Haimendorf films; colour and black-and-white

46332-46363 photographs: plants in Botanic Garden, Cambridge; colour

46366-464O5 artefacts: from a private collection; colour

464O7-46426 photographs: by Sir Robert Reid, c.1937-39, from India Office Library, London; black-and-white

46429-46438 paintings: by Col. R.G. Woodthorpe, 1876, from Library of Museum of Mankind, London; colour

46441-46444 photographs: by Dr. H.R. Hall, early 20th Century, from Museum of Mankind, London; black-and-white

46446-46459 sketches: from private papers of Ursula Graham Bower; black-and-white

4646O-46474 sketches: from articles

46475-46579 sketches: from private papers of W.G. Archer; black-and-white

4658O-46591 sketches: facsimile pages from source materials; colour and black-and-white

46593-466O8 sketches: of animals, from D. Macdonald ed., The Encyclopaedia of Mammals I&II, Equinox Books, 1984; colour

466O9-46693 sketches: from diary of Henry Balfour, 1921-22, from the Pitt Rivers Museum Archive, Oxford; black-and-white

46696-46762 sketches: from diary of Col. R.G. Woodthorpe, 1876; from Pitt Rivers Museum Archive, Oxford; colour

46764-46785 sketches: from H.H. Godwin-Austen diary, 1872-73; from Library, Royal Geographical Society, London; black-and-white

47687-46850 sketches: from J.H. Hutton, "Two Tours in the Naga Hills," 1923; black-and-white

46852-46959 illustrations: from books and articles; colour and black-and-white

46961-47007 sketches: of animals, from S.H.Prater and P.Barrel, "The Book of Indian

Animals",1965; colour

47010-47177 maps: sketch maps of Nagaland

47179-473O5 photographs: by C.Pawsey, 1937; C.A.Gourlay; F.Engledow; L.E.Macgregor; from Centre for South Asian Studies archive, Cambridge; black-and-white

473O6-4773O photographs: by J.H.Hutton, 1913-23, from the Pitt Rivers Museum Archive, Oxford; black-and-white

47731-47837 photographs: by J.P.Mills and J.H. Hutton, 1913-23, from the Pitt Rivers Museum Archive, Oxford; black-and-white

47838-48159 photographs: by J.P.Mills, c.1920-36, at School of Oriental and African Studies, Dept. of Anthropology, London; black-and-white

4816O-48995 photographs: by W.G.Archer, 1946-48, from private collection; black-and-white

48996-51638 photographs: by Christoph von Furer-Haimendorf, 1936-7, from private collection; black-and-white

51639-51958 photographs: by Charles Stonor, 1946-48, from the Pitt Rivers Museum Archive, Oxford; black-and-white

51959-53623 photographs: by Ursula Graham Bower, 1937-46, from the Pitt Rivers Museum Archive, Oxford; black-and-white

53624-53767 photographs: sketches from tour diaries; photographs from articles and books; photographs of Nagaland by S.Khilnani, 1987

Sound materials on the videodisc:

Audio track 1

00001-23250 All India Radio excerpts

23300-49550 Christoph von Furer-Haimendorf, 1970 field recordings

9620-51340
Field recordings, 1986-7,
field recordings, devotional songs:
49620-50610 tape 2, track 1 ;
50670-51340 tape 2, track 4

51350-52600
Ursula Graham Bower, 1986,
at Cambridge:
51350-52100 interview ;
52140-52600 song

52620-53999

J.H. Hutton, 1919,
 wax cylinder recording no. 7
Chang song

Audio track 2

 00001-33200
Chants des tribus, Paris

 00001-06750 A/2 Sema
 06850-11550 A/3 Sema
 11650-17550 A/4 Sema
 17700-21150 B/2 Sema
 21200-24850 B/3 Zeliang
 24860-29300 B/4 Zeliang
 29350-33200 B/5 Zeliang

 33250-42500
 Field recordings, 1986-7,
 33250-35910 tape 1, Khonoma
 35950-42500 tape 4

 42520-49750
 J.H. Hutton, 1919 wax cylinder recording: 42520-46020 no.3, "hoiyi olli", Angami song
  146050-49750 no.9, "lipeli", Sema song

 49800-53750
 Angami Naga Students E.P.:
 49800-53750 "Nyokro Kevupfe"
 51780-53750 "Loswulu"

CHAPTER SEVEN. CONTENTS OF THE TEXTUAL DATABASE.

There are a number of different classes of written records which provide the background documentation for the visual images and are of value in their own right. They make it possible to trace the process of documentation of Naga culture from the first, fairly random, fieldnotes or diary jottings, up to the final, polished, published book.

There are a number of manuscript daily diaries kept by soldiers, surveyors, colonial officials, anthropologists and interested observers.

From the earliest mid-19th century reports and diaries of Woodthorpe, McCulloch, Butler and Godwin-Austen through the illustrated museum curator's diary of Henry Balfour in 1922, and the detailed anthropological diary of von Furer-Haimendorf in 1936-7, to that of Mrs. M.Archer in 1947, there are the equivalent of over a thousand printed pages of diary material. These provide the most intimate and revealing reactions of the visitors to the Naga Hills.

There are extensive fieldnotes taken by anthropologists and colonial officers, describing every aspect of Naga life, from rituals and myths, to genealogies and house lists. These can be cross-referred to the diaries and provide a solid body of ethnographic description and preliminary analysis. The fieldnotes constitute the equivalent of over 75O pages of printed material.

A number of those who visited and worked in this area wrote letters to their family and friends in England. A selection of these letters, for instance those exchanged between J.P.Mills, J.H.Hutton and Henry Balfour, have been included. They describe some of the practical and theoretical problems that lay behind observing and collecting materials.

Colonial officers were required to make detailed reports on their tours of duty through Nagaland. These were then used by the government to provide the background for administration. Over one hundred such tour diaries made by J.H.Hutton, J.P.Mills and others have been transcribed, giving insights into colonial administration and the mentality of the observers. They constitute the equivalent of some 4OO pages of printed materials.

A considerable quantity of reports, surveys, gazetteers, and other official records were published by the British administration over this period. Much of this is in the India Office Library, and selections relating to the Nagas have been transcribed and included. This gives a strong impression of the official and secret activities of the British Empire in this corner of its territory.

The final major category is the extensive scholarly materials published as books or articles in learned magazines. Most of the books on the Nagas in this period are now rare, expensive and difficult to obtain.

For this reason they will be put into the textual database when the average store on a micro-computer becomes large enough. Individual monographs by Hutton, Mills, von Furer-Haimendorf, Graham Bower, Hodson, and Smith will be put in the textual database and indexed by paragraph and by topic. They include most of the major Naga subdivisions.

A preliminary list of what is included in the first issue of the data is given here.

Textual materials

Christoph von Furer-Haimendorf:

field diaries, 1936-7; field notes, 1936-7, 1970;

J.P.Mills:
letters, 1919-36; tour diaries, 1927, 1928, 1936;

J.H.Hutton:
letters, 1916-38; tour diaries, 1917-35;

U.Graham Bower:
field diaries, 1937-40; letters and field notes, 1937-47;
thesis, 1950;
W.G.Archer:
field notes, 1946-48; tour diary, 1946-47

Mildred Archer:
diary, 1947

Col.R.G.Woodthorpe:
tour diary, 1875; Report of Survey Operations, 1875-76

H.Balfour:
diary, 1922-23

K.Cantlie:
memoir, 1919-20; tour diary, 1919-20;

H.H. Godwin-Austen:
tour diary, 1872-73

Colonel J.Butler:
tour diary, 1870-73

P.J. Maitland:
Naga Hills Expedition, 1879-80

CHAPTER EIGHT.   CREATING FILMS AND PROGRAMS

Creating films and programs

With some idea of the materials available and how they can be retrieved, we can now consider how the visual and textual materials can be combined, re-ordered and enriched creatively in order to construct new materials. The searching power of the computer has been illustrated, but its ability to instruct the videodisc to carry out a series of logical steps provides an added dimension to its use. There are two main stages in this creative process. The first is to work out a logical sequence of actions, a script or 'flowchart', which will explain what the film or program is about. The second is to translate this into an 'authoring' language that will communicate with the computer.

There are various flowcharting conventions, and as long as the user finds them helpful, what is chosen does not matter greatly - unless one is sending the flowchart to someone else to do the programming. In the latter case, a set of agreed conventions such as those set out by Pioneer, are useful. It is possible that while for elaborate programs one will need some such pictorial flowcharting methods, for simpler users, a script can be written in ordinary words.

The second task is to turn one's script into something the computer can understand, through a high-level 'authoring' language. A number of such languages are available (and are reviewed in "Authoring Packages, A Comparative Report, Gill Strawford, National Interactive Videodisc Centre, London, 1988), of which 'Microtext' is among the best known. All of these can be used with this videodisc and database. But since most of them are very general, and hence have to be quite complex to deal with all possibilities, we have decided to develop our own. This is deliberately kept very simple, so that a user can sit down and begin to write programs within a few hours.

A brief preliminary overview of the system, Videoscript, the authoring system developed for this Project by Michael Bryant, and currently working with an 'Amiga' microcomputer with a 'genlock', may be given.

Videoscript; an authoring language.

Videoscript allows the user to write a series of commands, each on a separate line, as a file (using an editor or word-processor). This file is then checked and compiled, and can be run to show an interactive film. Versions can be written to work on two screens, one showing the videodisc picture, and one the computer graphics, or on one screen, mixing the signals onto the computer screen with a 'genlock' device.

There are three types of line. Lines starting with a semi- colon (;) are interpreted as the programmer's comment and are ignored by the computer. Lines starting with a colon (:) are interpreted as labels. That is, one can set a label somewhere in a script, and then by inserting that label name elsewhere, or asking the computer to 'goto' that label, create loops and sub- programs in the script. Examples will be given. Lines that are blank are passed over. If a line ends with a back-slash (\), it is interpreted that it is joined onto the next line. This is necessary when one is typing in text that goes on for more than one line.

In all cases other than the above, each new line is expected to start with a command word, followed in many cases by one or more extensions, for instance 'slow backwards', where 'slow' is the command and 'backwards' the extension.

There are two separate devices to control, the videodisc player and the computer. The control is exercised by writing a COMMAND (we shall use capital letters for commands, though they

can be in either case) and in many cases an 'extension' to that command (which we have put in round brackets below). For example one might have a line with find 2000, which has the command find, and the extension 2000, meaning the videodisc number.

CONTROLLING THE VIDEODISC

FIND (frame number) - finds frame number and enters still mode

PLAY (forward, backwards) TO (frame number)

SLOW (forward, backwards) TO (frame number)
SLOW SET (speed number, between 2-255, in units of 2Oms)

STEP (forward, backwards) - advances videodisc one frame

WHEN (frame number) - videodisc to report when reached that frame

AUDIO (1 or 2 - sets channel, on or off; e.g. audio 2 on)

VIDEO (on or off; turns off videodisc display in 2 screen versions; for 1 screen version see SHOW below)

CONTROLLING THE COMPUTER DISPLAY

CLEAR SCREEN - clears screen to current background colour

POSITION - sets the current position where writing will appear, vertically (v) and horizontally (h). The latter not yet implemented. The screen is 256 dots (pixels) high, so the extension command 'v 125' would start the text about halfway down the screen.

MARGIN - sets the current left or right margins for printing texts; the screen is 64O dots (pixels) wide , so the following commands 'margin left 5O' 'margin right 59O'(ie. 59O dots from the real left margin) would leave a border on each side

PRINT - prints on the screen whatever comes immediately after it; if the text is more than one line (it must be less than 800 characters, about 12O words), each line except the last must end with a \ character, as explained above. The text is automatically 'word-wrapped' within the set margins.

CENTRE - centres any text coming after the command

FONT - (1 or 2) - 1 is 12 dots high, 2 is 15 dots high)

COLOUR (text or background) - sets the current colour; the standard colours are:
 1 - pale grey 2 - pale cyan 3 - dark brown 4 - lavender 5 - dark blue 6 - dark red 7 - salmon pink 8 - black

COLOUR RESET - restores the original default colours

SHOW (mix, computer, video) - mixes the signals, or shows just the computer or videodisc output

These commands are written in sequential form within a script, which itself requires certain commands and extensions.

SCRIPT FLOW COMMANDS

PAUSE (number) - cases the computer to pause before executing the next command, numbers are in tenths of a second.

GOTO (label name) - causes computer to go to a set label, and to continue from the command on the line after that label. This and the next command, with the setting of labels (always starting with a colon, e.g. :label or :here, enables the setting up of potentially infinitely complex loops and sub-routines.

INSERT (label name) - as above, except the current script position is remembered and returned to once the inserted block has been executed

RETURN - causes a script execution to continue after an inserted block as above

END (script, programme) - marks the end of the relevant section of the script or programme; end script means that any text following it is ignored unless an 'Insert' points to it; end programme leaves a pause of 1O seconds, then returns to the initial position.

As well as ordinary, sequential, scripts, it is possible to write interactions, where the user can make choices and 'branch' in different directions. This is done by a set of interaction commands.

INTERACTION COMMANDS

INTERACTION - starts an interactive sequence

HEADING (followed by up to 2 lines of text), writes a heading for the interaction choice

CHOICE (number 1-5; text) - sets up a choice box, with up to two lines of text against it, a sub-heading or question. If more than five choices are needed, one or more of the boxes can take one to further choices.

END - ends the interaction sequence

The scripting system is put into operation as follows. The file which contains the script, which should always be given a filename with a 'vs' sub-name, e.g. fishing.vs, is first checked and compiled. This is done by the following command:

vcon fishing.vs

This will report any logical errors in the file, which will need to be corrected if they have prevented a 'run' file being created. If there are no serious problems, one then types:

vrun fishing

At this one will be shown a screen with a choice. Since the run file is already mounted, one clicks on 'run', and the programme one has created is shown.

In order to make it easier to understand this, we may give a few very simple examples (these may be run on the videodisc). The first is very short:-

```
clear screen
colour background 5
colour text 2
font 1
margin left O
margin right 64O
position v 8O
centre my first script
pause 3O
clear screen
colour background 7
colour text 3
font 2
position v 8O
centre this is just an example
pause 3O
end script
end programme
```

A full version of the Manual is available.

Please note also that the full account of the information retrieval system that works with this data, the Cambridge Database System, is available in a separate Manual.