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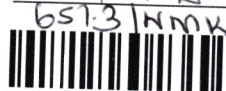
The
Annual Report
of the
NATIONAL MUSEUMS of KENYA

July 1991 - June 1992

KENYA NATIONAL ASSEMBLY

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MESSAGE from the CHAIRMAN

During the period covered by this report, the Board of Governors met 5 times and several members of the Board gave time to sit on sub-committees and to attend to special duties. The Board members continue to give their time on an entirely voluntary basis and I would like to acknowledge and thank each member.

All over the world, Museums are having to re-examine their purpose and compete for increasingly scarce funds. Our institution is in the same situation and there is an urgent need to formulate mid and long term plans. The Board has begun this complex process with the assistance of the Director, his staff and various consultants. The main concern at present is to define and secure the core functions of the organisation and this may well require some fairly drastic changes.

Although the government has continued to be very generous in its financial support, the rate of inflation has been such that the funding level is inadequate for a realistic and secure plan of work. In particular, the institution is finding it increasingly difficult to sustain professional and management staff and in future, the Board will need to address this issue directly.

As will be seen from the report, the National Museums have continued to enjoy the support of the Parent Ministry. A number of donor organisations have also been closely involved with programmes and assistance and to all I extend the Board's gratitude and thanks.

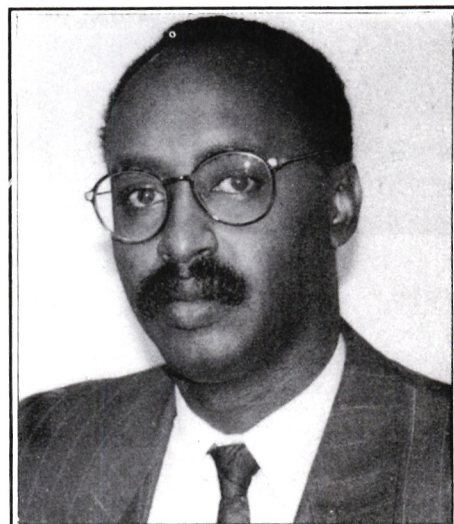
In spite of the many difficulties and frustrations the National Museums have had a successful year and to a large extent, this is thanks to the Director and his staff. On behalf of the Board I extend thanks to all staff.



Dr. Richard Leakey

MESSAGE from the DIRECTOR

The 1991/92 year was one in which the institution looked both inward and outward. In many ways it was a year of transition in that it has become quite evident both for the country and for the National Museums of Kenya (NMK) that we will face some significant changes and challenges in the years ahead. The socio-economic and political realities of today's Kenya dictate that to continue to exist or even survive into the next decade the National Museums, must justify its relevance to the public at large.



Dr. Mohamed Isahakia

Much of the year was therefore spent by a large number of our staff on a Strategic Planning process that is yet to be concluded. Prospects for reduced government funding in the face of a national economic recession has perhaps been the main impetus to revive and reformulate the strategic direction being pursued by the National Museums in order to revitalise its sense of purpose. However, the process of planning has also been necessitated by changes in the environment in which the institution operates: the quest for a new understanding of contemporary Kenya, the ramification of cultural erosion in the face of technological development presenting new opportunities for the Museums, the need for the Museums to provide a more effective response to Kenyans seeking better understanding of their heritage, and the challenge of achieving more in the context of reduced public spending.

While the completed strategy will help the Museum to improve its effectiveness in a number of different ways, the planning process itself has not only helped bring into focus problems but also provided solutions to the problems themselves. For example we have begun to examine the financial planning and administrative structures governing the Museums. An updated planning process and a fully intergrated information system is being developed to guide and focus the energies of the National Museums more closely. In the past year the Museums embarked on a computerization plan that included both the scientific and administrative databases. By the end of 1994/1995 period each of the Museum departments will have a collections database that will ultimately be intergrated onto one scientific database. This has been given priority in order to ensure a high standard of maintenance of the collections. Collections housed at the Museums form

ADVISORY COMMITTEES

Lamu Museum

Ahmed Abdalla El-Maawy
Ustadh Harith Swaleh
Abdallah Ali Skanda
Sheikh M. Abdulkadir
Kjell Nordenskiold
Fatma Salim El-Busaidy
Abbas Sheikjuna

Fort Jesus Museum

Rashid Ali Riyamy, Chairman
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Councillor Abdulatif Ubwa
Abubakar Maddy
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Eleanor B. Shaw
Anny Jensen
Tove Hussein
Sussan Allanson

Meru Museum

Karaya E. F. Njagi, Chairman
Francis Rintari
Moses Gituma
Mutuma Angaine
David Maitai Rimita
Peter Mbero
Zachary Kimathi
Harriet K. Mwongera
Celina N. Kiruki

With Agenda 21, the deserved rise in popularity of the term "Biodiversity" and the increase in international interest in the concept, demands on the Centre have intensified. Among the activities of the Centre are the following:

National Biodiversity Unit

The role of the National Museums in biodiversity conservation was strengthened in 1991 when UNEP requested the Kenya government to undertake a study of the country's biodiversity resources. In response, in September 1991, the government set up the National Centre for Biodiversity based at the National Museums. The Museums, in collaboration with the National Environmental Secretariat (NES) undertook a study entitled "Kenya country study on costs, benefits and unmet needs of biological diversity within the framework of the planned Convention on Biological Diversity". The study documented Kenya's natural resources and brought together, in some cases for the first time, data on species and habitats within the country. Gaps within the existing knowledge were identified. The study looked at the linkage between the economic and social development of the country and its biodiversity. In addition it identified specific programmes that the country needs to follow to arrest biodiversity loss. Finally it addressed the question of what the benefits from biodiversity conservation are. The resulting document was part of the Kenya Government presentation at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil in June 1992.

Tana River Primate National Reserve Project

The endangered Tana River primates continue to be a focal point of the National Museum's research in conservation. The National Museums has continued to collaborate with the Kenya Wildlife Service in studying the Tana river monkeys as a means of conserving biodiversity. The goal of research and monitoring is to coordinate various activities regarding conservation and study of the Reserve's unique flora and fauna. The project is designed to establish management

practices, research and monitoring programmes and community activities that will help to maintain the biodiversity and physical integrity of the Reserve on a sustainable basis. The project will define factors (abiotic, biotic and human) which threaten the integrity of the Reserve. Proposals have been made to the Global Environmental Facility (GEF) to fund research in the Reserve.

Kenya Indigenous Forest Conservation

Under the Kenya Indigenous Forest Conservation Programme (KIFCON), the Museums has been inventorying various taxa in threatened, often fragmented, forests and establishing monitoring activities for the long-term. The project has been a perfect testing ground for multidisciplinary research and provides a model on which the Centre for Biodiversity can base a broader long-term approach.

The Mpala Research Centre

The Mpala Research Centre (MRC) was established by a consortium of the Kenya Wildlife Service, the National Museums of Kenya, the Mpala Wildlife Foundation, the Smithsonian Institution, Princeton University, and Mr. George Small, the ranch owner. Its purpose is to undertake basic and applied research on the ecology and management of savanna ecosystems, to promote training in these fields and to make the results of these studies available to conservation and natural resource management organization.

The MRC consists of 50,000 hectares of grassland and Acacia woodland in the centre of the Laikipia plateau, west of Nanyuki. At present research facilities are being developed but already research work is in progress with researchers living in tents. Research facilities are expected to be completed in early 1994.

Elangata Wuas Ecosystem Management Programme

The Elangata Wuas Ecosystem Management Programme aims at the establishment of a community-based sustainable management system for a natural environment that

ZOOLOGICAL SCIENCES

Invertebrate Zoology

The Department of Invertebrate Zoology offers identification services for all invertebrates, both aquatic and terrestrial, especially for research institutes and colleges. In addition to this, it provides training in biosystematic techniques for students, museum staff and visiting research scientists. It is responsible for maintaining and curating the invertebrate collection, one of the largest in Africa. The department also conducts research on target species of economic and agricultural importance and some species which are threatened. This includes ecological investigations and taxonomic studies.

Kenya Indigenous Forest Conservation Project (KIFCON)

The Department participated fully in all field surveys undertaken by KIFCON. Detailed surveys and identification of important species were carried out. Most emphasis was put on forest-dependent species and rare/endemic species which are of conservation value or concern to Kenya and the world at large. Both aquatic and terrestrial invertebrates were surveyed in forest ecosystems. Field work was, as usual, followed by extensive sorting, identification and curation of specimens in the laboratory.

Collaborations

The department was involved in several collaborative projects. Between August and September 1991, a project to identify pests (wax moths) of honey-bee was undertaken with the Bee-Keeping Department of the Ministry of Livestock Development. In July 1991 a joint project with Professor G. H. Schmidt of Hanover University on systematics and evolution of the family Tettigonoidea, subfamily Hetrodinae was carried out. Another project in 1991 was with Dr Manfred Kaib to study the fungus growing termites at Mombasa and Namanga. The work resulted

in two papers on *Macrotermes* species. A trip to Western Kenya resulted in a collection of termites which were sent to Germany for isoenzyme analysis. In July 1991 a BBC team from Britain which made several trips around Lake Nakuru National Park with members of the department. They collected live insects (Hymenoptera) to make films of "siafu" ants. The NMK - Italian Ornithological Expedition visited Lake Turkana to study dung beetles.

Osteology

The Department continued to perform its major role of acquiring, preparing and curating a vast variety of vertebrate skeletons. It houses skeletons of animals ranging from a gigantic whale to tiny mice. The collection has grown tremendously over the years to more than 11,000 partial and complete skeletons.

Apart from maintaining the osteological collection, the staff have been extending services to the general public, students and local and international researchers who visit the Department. These include training of interns on identification techniques, identification of faunal remains from palaeontological and archaeological sites and assisting researchers carrying out studies on bone morphology, diseases and other aspects of modern osteology.

Collection of marine and fresh-water fish continues

Fish bones occur frequently in coastal archaeological sites, so that there is considerable demand for good reference material. Since there are no such collections readily accessible, the Department has been expanding its collection of marine and fresh-water fish and a total of 283 skeletons have been collected to date.

During the year, the Department made two trips to Kipini at the Tana River delta, an

the Kakamega Forest, and extensive additional work was carried out in Trans-Mara in early 1992 when baseline data were collected that will be used to assess the environmental effect of upgrading a forest track to a major tarmac road. In August 1991 a short survey was made at Gede Ruins to monitor the status of the threatened Spotted Ground Thrush, *Turdus fischeri fischeri*. In parallel with the field work, a literature review is underway to profile the distribution of birds in different types of forest across the entire country and to identify conservation priorities.

Training waterfowl counters to monitor Kenya's wetlands

The Department continues to coordinate waterfowl counts at important wetland sites, mainly in the Rift Valley. With support from the Ramsar Convention's Wetland Conservation Fund, the emphasis this year has been on training volunteers as well as collecting data. Around 150 volunteers have so far taken part in the counts, including staff from the National Museums and from Kenya Wildlife Service, amateur birdwatchers and students. In January 1992, we achieved the best coverage to date, with counts at Lakes Magadi, Naivasha, Oloidien, Sonachi, Elmenteita, Nakuru, Solai, Bogoria and Baringo. The counts are strictly standardized from year to year, allowing us to track the ecological health of each wetland and to obtain a better understanding of waterfowl populations and movements.

Waterbird surveys at Natron, Turkana and the Tana River Delta

In addition to these censuses, the Department took part in aerial surveys of breeding flamingos at Lake Natron, Tanzania, during November 1991 and January 1992. These formed part of an environmental impact assessment of planned impoundments on the southern Ewaso Nyiro river. Lake Natron is the world's main breeding ground for the Lesser Flamingo, *Phoeniconaias minor*.

In January and February 1992, a joint expedition in collaboration with the University of Pavia and the National Institute for

Wildlife Biology in Italy, was organized to Lake Turkana, one of Kenya's most important but least known wetlands. Six Department staff were able to take part thanks to support from Olivetti Ltd. and Sogei Ltd.

The object of the expedition was to assess waterbird numbers and the habitat choice of different species. A complete aerial survey was backed up by detailed foot-counts along 50 km of shoreline near Loiyengalani. The results confirm Turkana's enormous significance for waterbirds, with internationally important populations of many species. Along with the waterbird surveys, a short study was also completed on the ecology of the Crested Lark, *Galerida cristata*, one of the few bird species common in the inhospitable desert around the lake.

In May 1992, an eight-month ornithological survey of wetlands in and around the Tana River Delta was begun. This area is rich in biological diversity and a National Wetlands Reserve has been proposed. However, the delta still faces severe environmental threats from various development projects. The survey is funded by the Netherlands Government.

Project to conserve birds of prey begins

In 1992 a memorandum of understanding was signed with the Peregrine Fund, Inc., a raptor conservation organisation based in Idaho, USA, for a joint project to study and conserve Kenya's raptors (birds of prey). As predators, raptors are among the most biologically significant and sensitive indicators of the health of ecosystems, and are key elements in the maintenance of community equilibrium. Kenya supports an astonishingly high diversity of raptors, with no fewer than 72 species recorded. Unfortunately, they are increasingly under threat from human activities, including direct persecution, habitat destruction and pesticide use.

The four main goals of the project are to:

- (1) Develop public awareness and education about raptors;
- (2) Train a Kenyan student in raptor biology;
- (3) Conduct studies on raptors and the

Honeyguide Project. This project, based at Ol Ari Nyiro Ranch in Laikipia, involves intensive trapping, marking, observation and radio-telemetry of individual honeyguides of several species. Honeyguides are brood-parasitic, laying eggs in the nests of hole-nesting birds such as barbets and woodpeckers. The problems of studying their ecology are thus formidable. More than 900 individuals have now been ringed at Mukutano, affording many new insights into their population biology and social systems.

Eight years of field notes on other bird species at Ol Ari Nyiro are now being collated into a book-length treatise that will form a valuable contribution to our knowledge of woodland and bushland birds in Kenya. Such long-term studies are generally lacking for these habitats in the tropics.

Department trains airport bird scouts

In August 1991 the Department organized a training course for eight personnel from the Department of Aerodromes. The course was intended to give a grounding in the techniques of identifying, monitoring and controlling problem birds at airfields. Those who attended the course will now operate as bird scouts at their respective stations.

Departmental staff have continued to lecture to student groups visiting the bird room. Supervision has been extended to students or staff on attachment from the Kenya Polytechnic, Mweka College in Tanzania, and Moi University Department of Wildlife Management.

The Department was closely involved with the organisation of a seminar, "Wetlands of Kenya", held at NMK in July 1991 under the aegis of the Kenya Wetlands Working Group. Ornithology staff also continued to offer technical advice on a wide variety of issues and compiled a report on avian biodiversity for a UNEP study on the costs, benefits and unmet needs of biodiversity conservation in Kenya. In June 1992, a popular bi-annual bird magazine, *Kenya Birds*, was launched replacing *Museum Avifauna News*. The magazine, produced with the help of ICBP-Kenya, will provide up-to-date information on all aspects of Kenya's diverse bird life.

Molecular Genetics

Considerable progress has been made in all areas of research addressed by the Department of Molecular Genetics, and this is reflected in the expansion of the Department from one to three laboratories in the Zoological Sciences Building. With this consolidation of all activities under one roof, and the associated administrative streamlining, the Department is poised to build on progress made on existing projects and expand into new areas of research. This will be facilitated by the addition of personnel, as well as the further development of space in the old and new Zoological Sciences Buildings. The laboratories already form a unique scientific resource on the continental level, and the aim is to establish a true centre of excellence to apply genetic techniques to the study of biodiversity, as well as medical, veterinary, and agricultural sciences.

Current activities involve several areas of interest. Several research projects are ongoing, and can broadly be classified into research on endangered species such as the Wild Dog, Red Colobus, cheetah, Hunter's Hartebeest, elephant, and Rhinoceros, and research on species likely to be important in sustainable utilization of wildlife resources. The latter category involves research on the population-genetic variability of commercially important wildlife species such as buffalo, wildebeest, gazelle, waterbuck, hartebeest, impala, zebra, and ostrich.

Genetics for Species Management

The principal aims of these projects are to provide crucial information in the design of informed management plans for the future management of wildlife species. The intelligent design of breeding programmes for rhinos in sanctuaries, the management of endangered species such as cheetahs and the Tana River Red Colobus, the informed utilization of wildlife species in game ranching schemes and the formulation of both *in situ*

BOTANICAL SCIENCES

Herbarium

Research in the Herbarium is primarily focused on the taxonomy, distribution, use and conservation of Kenya's plants. The information gathered, is stored in a form for easy reference and is made available to the public and the wider research community.

The Herbarium also provides services in plant identification and in answering queries from the public and thus facilitates the research of other organisations within and outside the country. Considerable time is spent in the maintenance, curation and updating of the collections which together with the research contribute to the information base needed for studies of taxonomy, distribution, conservation and utilisation of plants.

Plant Identifications

While 1,656 specimens were received for identification, a total of 2,023 specimens were identified, mostly from earlier batches. In order to clear the backlog of plants waiting for identification, a retired technician was recruited as from April 1992. Under the exchange programme with other Herbaria 763 duplicate specimens were sent out, mostly to Kew, while a total of 2,645 specimens were sent out as loans.

Indigenous Food Plant Programme

The programme continued in the original six districts; Turkana, Baringo, Kajiado, Nyandarua, Kilifi and Siaya. In addition surveys and promotion were extended to Kitui, Machakos and Makeni Districts where the Herbarium worked closely with World Neighbours, an NGO which had requested this help from IFPP. Promotional workshops were held, specimens as well as materials for food analysis were collected and information added to the data base.

In March 1992, some Herbarium staff took part in the documentary film on IFPP together with other IFPP staff. The documen-

tary was produced by the Worldview International Foundation. It was launched at NMK by Hon. Jeremiah Nyaga on 19 May 1992 and was among video items shown in Rio in June 1992 during the United Nations Conference on Environment and Development (UNCED)

The demonstration garden of indigenous food plants continued to attract student groups. Seeds produced were given out to collaborators in the field.

Kenya Country Study on Biological Diversity

This was a major task between October 1991 and January 1992. Although it involved many departments in the Museum and other institutions, staff in the Herbarium were responsible for producing data on plants ranging from counting species to coding information on distribution, rarity, utilisation and conservation status.

Plant Conservation and Propagation Unit

Following the successful Plant Genetic Resources Workshop held at the NMK in 1987, there was a general consensus that there was a need to conserve the indigenous flora of Kenya especially the rare/endangered species as well as those that are potentially useful. It was with this in mind that the just ended ODA/ NMK Agroforestry and Mycorrhizal Research for Semi-Arid Lands (AMSAL) project was designed to facilitate the acquisition of necessary expertise for proposed plant conservation work at NMK.

As a result of these efforts, the Plant Conservation and Propagation Unit (PCPU) was set up within the Herbarium following a generous grant from ODA. The objective of this unit is to assess the national genetic diversity of economic and endangered species and implement practical measures of propagating them with the ultimate aim of replanting them. The Unit started operations in January 1992 with the arrival of Mr. Tim Pearce who is the Technical Co-operation Officer from ODA.

our agricultural economy in the event of increased atmospheric temperatures and CO₂ concentrations. In our endeavor to provide this vital information, we have adopted a rigorous programme to raise sediment cores from various lakes in the country, initially to assess the preservation status of various micro-fossils in different lakes. Patrick Ng'ang'a is using some of these samples for his doctoral research at Duke University, specializing in ostracods. A 2m core from Lake Amboseli has revealed significant changes in the surrounding vegetation, based on sediment lithology and analysis of organic carbon content, diatom particles and charcoal particles. Although pollen preservation in Lake Amboseli appears to have suffered from the alkaline waters, a few indicators of a previous more wooded, less alkaline environment have been obtained. The possible cause and the actual date of the change has yet to be established.

Environment and Pre-historic Cultures

Cultural adaptations to environmental change particularly in pre-historic times has continued to be a research interest. In collaboration with Dr Richard Potts, a palaeontologist at the Smithsonian Institution, palaeosols at Olorgesaille have been stratigraphically sampled to reconstruct the palaeoenvironments of the makers of stone tools who occupied the area during the Pleistocene. Pollen analysis on these samples is still progressing. Analysis is also continuing on samples from a cave in the Naivasha basin in which stone tool makers associated with five lake levels during the Pleistocene have been identified. For more recent history, we have been studying charcoal particles from lake sediments to show the history of the use of fire by man and its impacts on the environment.

Pollen and Plant Diversity

The description of plant species through pollen morphology has long been used as a taxonomic tool in plant systematics. Material support and professional services have been given to several post-graduate students at

Moi and Kenyatta Universities in their dissertation research. Assistance has also been given in a very little known but important field in which phytoliths, which are morphologically diverse silica bodies in plant cells, have been used to provide anatomical features used in plant taxonomy.

Phytochemistry

The Phytochemistry Department supports and stimulates research and training in order to gather information on the phytochemical aspects of natural (biotic) resources for future economic exploitation. The laboratory is well endowed with multiple chromatographic equipment and spectroscopic facilities, freezers, driers, and extractors. Collaboration with other departments such as the Herbarium and the Institute of Primate Research gives access respectively to ethnobotanical and bioassay data.

Utilization and Conservation of Bioresources

This project is investigating natural products with potential pharmacological, physiological or therapeutic uses against major tropical parasitic diseases such as malaria, schistosomiasis, and leishmaniasis. It is also studying the chemotaxonomy of selected plant species with the aim of elucidating their systematic relationships and evolutionary patterns. And finally it is to study the nutritional value of secondary products of selected wildlife food plants to elucidate their possible effects on animal or human migration and survival.

Other Research Activities

Plant extracts/isolates were tested for their potential in killing the vector snails of the schistosoma parasites. Malaria research was undertaken testing selected plant extracts for the growth inhibitors of *Plasmodium* species.

The use of phytochemical patterns as taxonomic markers were investigated by comparing the chemotaxonomic relationship of the Aloe with that of genera in the family Liliaceae.

team worked in Kenya for several months in 1991, continuing their documentation of faunal and environmental change through the sequence. Several intervals of probable faunal change have been identified. The primate fossils recovered included:

- at least two species of hominoid (cf *Proconsul major* and cf *Kalepithecus*) and two cercopithecoids (cf *Victoriapithecus*) from the Kipseramon bone bed dated at 15.4 Ma.

- 42 teeth of four individuals similar to *Kenyapithecus* from another site at Kipseramon dated at about 15.2 Ma.

- A hominoid incisor tooth and eight 12.5 Ma teeth of the early monkey *Victoriapithecus*. The latter represent the latest occurrence of the subfamily Victoriapithecidae in the fossil record.

- a tooth of a colobine from 6.5 Ma.

Visiting researchers associated with this project included Drs. Steven Ward, Bobby Brown and Kay Behrensmeyer.

Ologesailie Research Project: "Hominoid Activities and Palaeoecology of an early Pleistocene Landscape"

This project, coordinated by Dr. Rick Potts as part of the Smithsonian's collaborative venture with NMK, has been in progress since 1985. Field work continued in 1991. Ologesailie is a Pleistocene lake basin con-

taining lacustrine, lake margin, deltaic, and fluvial sediments. Acheulian handaxes are extremely abundant and have been the subject of several investigations in the past. This study aims to examine the distribution of artifacts and fossils on an ancient stable land surface, 0.99 Ma. old, which extends for 4 to 5 kilometres and represents a winding transect through the ancient lake margin. Excavations and surface collections provide the means to interpret the activities of the ancient people inhabiting the area, their land use patterns, their interactions with carnivores, and their place in the general palaeoecology. Visiting researchers involved in this project included Dr. Tom Plummer and Dr. John Kingston.

Samburu Hills and Nachola Field Project

This project, which began in 1982 as a collaboration between Kyoto University and NMK, is coordinated by Prof. Hidemi Ishida. Geological field studies continued in 1991 but palaeontological field work has been suspended while the earlier collections are being studied. Two important sites, Nachola, (11Ma) and Samburu Hills (9 Ma) have yielded rich fossil records. Japanese members of this collaborative project have visited the museum on several occasions to study the fossil collections. Visiting researchers involved in this project included Mr. Y. Kunitatso.



The excavation of the Turkana Boy Skeleton at Nariokotome, West Turkana

Rift. Department of Antiquities, Lilongwe, Malawi.

Dr. Elisabeth Vrba - **Fossil Reduncini (Bovidae)**. Yale University, New Haven, CT, USA.

Ms. Diane Waddle - **The archaic *Homo sapiens***. Ph.D. programme. Department of Anthropology, SUNY at Stony Brook, New

York, USA.

Dr. Carol Ward - **Comparative study of higher primate postcranial elements**. University of Missouri, Columbia. USA.

Prof. B. Wood - publication of **The Koobi Fora Research Project Vol.4**. Department of Human Anatomy and Cell Biology, University of Liverpool, UK.



Dr. Meave Leakey (holding a hominoid fossil) explains a point to her Excellency Ginko Sata the Japanese Ambassador to Kenya who was on a visit to the Museum

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analyzed. The Hyrax Hill Neolithic site was also excavated in 1992. The objective of the excavation was to retrieve sufficient fauna for the purpose of elucidating the economy of the site as well as to obtain a charcoal sample for dating. This site is important because it might contain crucial information on the transition from hunting and gathering to food production. This is supported by data from the previous 1938/39 excavations by Mary Leakey that show a mixture of hunter gatherer stone tools and ceramics that are always associated with pastoralists elsewhere in East Africa. Thus it appears the site was one where the hunter-gatherers and pastoralists interacted, and may contain important information that can explain the processes of the change from a hunting and gathering to a pastoral adaptation. Unfortunately nothing is known about the fauna since all the bones of the 1938/39 excavations were destroyed in the bombing of London during the second World War.

Archaeological investigations at Lokalelei late Pliocene site

As part of his research and Ph.D. Dissertation program, Mzalendo Kibunjia completed field work between June and September 1991, excavating the site of Lokalelei. The site, the oldest so far excavated in Kenya (2.32 Ma), is located in the Nachukui Formation, to the north west of Lake Turkana. The investigation focuses on the establishment of the stratigraphic context of the archaeological horizon, the extent of the site, and the retrieval of samples of lithic artefacts and fauna. Analysis of the excavated material will indicate the technology and ecology of the early hominids occupying this area at this particularly important period of time for human evolution. More than 50m² have now been excavated at Lokalelei, providing important material which is now under study.

Collaborations

Mr. Masatoshi Yamashita, from Japan Overseas Cooperation Volunteers started to work with the Division in September 1991. His main task was to write the programs for the Archaeology Database System, which is working on Unix and was developed using Fox Base+.

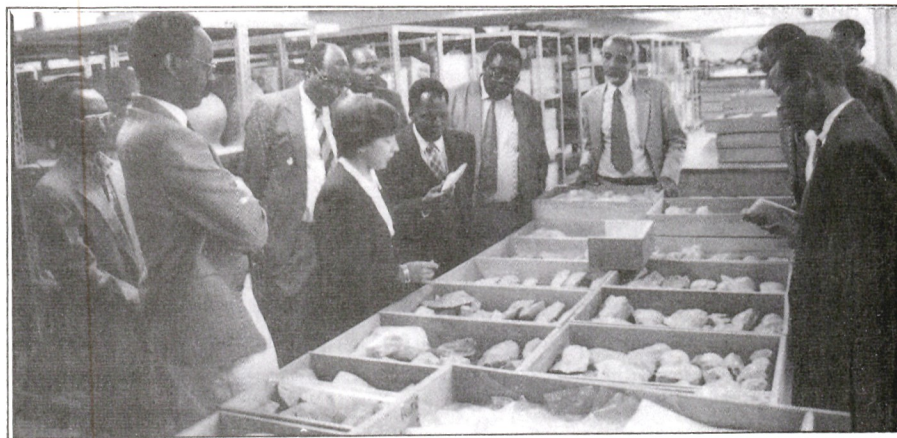
Dr. Stanley Ambrose from the Department of Anthropology, University of Illinois, Urbana, U.S.A. studied Hunter Gatherers adaptations to climate change in the Kenya Rift Valley in (September/December 1991 - June 1992).

Mrs Nancy Sikes from the Department of Anthropology, University of Illinois, Urbana, U.S.A. studied the Ecological models of early hominids foraging and land-use patterns by reconstructing the diversity of floral microhabitats with stable carbon and oxygen isotope analysis. (September/ December 1991).

Dr. Pierre-Jean Texier and Mrs. Michèle Reduron from Sophia Antipolis and Meudon, France, studied the Technological analysis and illustration of the lithic assemblage of Isenya acheulian site. CNRS, ERA 28, (February/March 1992)

Ms. Alison Kelly of the Department of Anthropology, Douglass Campus, Rutgers University, New Brunswick, U.S.A. A comparison of the paleoenvironments and land use patterns in the Middle Stone Age and Upper Acheulean of Eastern Africa. (September/October 1991)

Mr. Z.K. Kamencu, (6th from left) Permanent Secretary, Ministry of Home Affairs and National Heritage, on a visit to the Archaeology Department.



NAIROBI MUSEUM

Exhibits

Gallery of Contemporary East African Art
During the period under review several exhibitions were held in the Gallery which provided a unique show case for contemporary East African artists working in a range of different media. During the period covered by this report the Gallery organized and arranged exhibitions ranging from children's art work to the work of established artists. There were 10 such exhibitions. The revenue raised is used to cover running costs and acquire National Collections of Contemporary Art of East Africa for the National Museums of Kenya.

African Rain forest

The Museum hosted a temporary exhibition "African Rain Forest Week" organized by the African Rain Forests Network from 2-6 June 1992. The exhibition was planned to coincide with the World Environment Day on 5th June 1992, and the United Nations Conference on the Environment and Development held in Rio de Janeiro, Brazil.

The exhibition showed the various ecological, economical and cultural values of forests and trees in general. A number of display panels put emphasis on specimens of endangered fauna and flora of the rain forest. A section of the exhibition contained samples of traditional medicines derived from forests

in general. Some ecological aspects of the rain forests, including the relation of deforestation with climate change and water conservation, were also shown.

Rehabilitation of Olorgesailie Museum

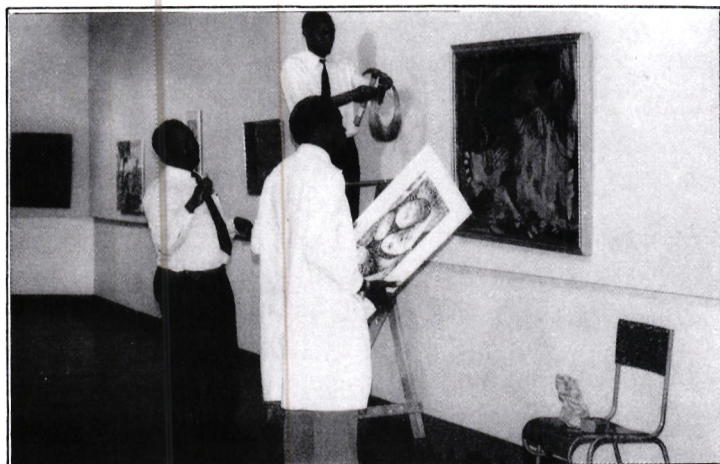
For a long time the Olorgesailie Site Museum has been somewhat neglected, to the point where exhibits, bandas, roads, fences and water supply system had seriously deteriorated. Work on the rehabilitation of the site and the museum building started in December 1991.

The Museum exhibits were planned in collaboration with the Smithsonian Institution and the Los Angeles County Museum of Natural History, through Dr. Rick Potts. The Los Angeles County Museum designed the new exhibits, printed all the label texts and panels and was responsible for the specialized art work. The National Museums of Kenya was responsible for providing artefacts and proof-reading the exhibit labels. The curator of Nairobi Museum coordinated the project.

Carnegie Museum Link

In January and February 1992, a team from the Exhibits Department of the Carnegie Museum of Natural History, including Dr. Duanne Schlitter, James Senior and Pat Martin, visited the National Museums of Kenya in order to gather information and to collect natural history specimens for the Carnegie's proposed exhibit entitled "The Hall of African Wildlife", scheduled to open in May 1993.

Anthony Njogu of the Exhibits Department accompanied the team and made specimen collecting trips to many parts of the country including Samburu, Masai Mara and Tsavo National Parks. As part of the link Anthony Njogu joined the Carnegie Museum on an Inter-



An exhibition being mounted at the Nairobi Museum

Library (established in 1977) was transferred and amalgamated with the main museum library collection.

EEC grant

Library Journal subscriptions and book purchases for the period 1991/92 were enabled through the EEC grant and the funding was renewed for 1992/93.

The Library was awarded a sponsored subscription to the Journal "*Conservation Biology*" published by the Society for Conservation Biology. The award is provided by the Biodiversity Support Programme, a consortium of the World Wildlife Fund.

In support of the Biodiversity Programme at the Museums, the library acquisitions focused on various topics. Titles acquired include: "*The Environment in Question*", "*Global Climatic Change*", "*Biodiversity of Tropical Rain Forests*", "*Dynamic Aquaria*", "*Bird Migration*", "*Challenges in the Conservation of Biological Resources*", "*Butterflies of Kenya and their Natural History*". On periodical additions, new titles include: "*Environment update*", "*Aquatic Botany*", "*Biodiversity and Conservation*", "*Marine Environmental Research*", "*The Holocene*", "*Conservation Biology*".

Education

The Education Department has the important role of interpreting the exhibits and the Museum's collections to the Museum's many visitors. In particular the Department focuses on the educational use of the museum resources by the public, especially teachers and pupils, and assists in translating the museum's research findings into suitable teaching programmes at the appropriate level.

A number of programmes have been organised during the period under review. An example is the Indigenous Food Plants Programme which derived its name from a joint project of the National Museums of Kenya, the Kenya Freedom From Hunger Council and the Worldview International Foundation. The target audience for the pro-

gramme was upper primary school children although it attracted groups from secondary schools as well. Other programmes offered included 'Evolution of Man in East Africa', and film shows on a wide variety of subjects, particularly natural history.

Know Your Museums

Public education on Museums was conducted through festivals and the mass media. During this period the Department started a programme entitled "Know Your Museums" jointly with Kenya Broadcasting Corporation (KBC). This is a series of 15 minute programmes covering different aspects of museum work, with an aim of correcting the rather widely held crude concept of the museum as a place for keeping dusty old items.

Public Programmes

The Cultural Easter proved to be a considerable success, attracting both school children and the general public. The activities offered included traditional dances, drama by the University of Nairobi Free Traveling Theater, comedy by Vioja Mahakamani and live snake handling sessions by Museum staff.

Cultural education was conducted through the involvement of local experts. The Department organized pottery demonstrations and invited women potters from Mugoiri in Muranga District to demonstrate their skills in the Museum. This was another successful public programme that attracted people from all walks of life.

In addition to the special programmes the Department was on several occasions called upon to talk and show films to groups from local universities.

Archives

A significant amount of work was completed on the the Joy Adamson photographic collection that was deposited in the museums by her trustees. Miss Pauline Ngimwa assisted with the organisation and archiving of the

various District Development Committees in the country at Garissa, Gazi, Kakamega, Kapenguria, Kitui, Lodwar, Malindi, Meru, Muranga, Nyeri, Rusinga and Siaya.

Archaeological Sites

The controversy at Hyrax Hill Archaeological Site may soon be a thing of the past, since an advanced stage has been reached in the process of securing a title deed. Already, the Kenya Boy Scouts who had occupied part of the site for the past 20 years have agreed to move out. For the first time since the early sixties, the Nakuru Industries too have agreed to negotiate with the National Museums of Kenya and there are indications that the Museums may get extra land if a new road is constructed in place of the one at the site. Lanet Archaeological site was visited but there is a problem with maintenance of the fence due to vandalism. It has been suggested that the Museum approach the Kenya Wildlife Service to have the fence electrically wired. This will keep thieves from stealing posts which are locally used as firewood.

Monuments

Several monuments have been listed for protection. The Njuri Nceke house in Meru, formerly owned by the traditional council of elders and used as a traditional parliament, was donated to the museums and has been declared a National Monument.

In Nairobi, the former Provincial Commissioner's office (first District Commissioner's office), currently housing the Nairobi Kanu offices, is to be gazetted and turned over to the Museums. Similar efforts are underway to secure Kipande House for gazettement and subsequent protection. The house is currently housing a branch of the Kenya Commercial Bank. In Mombasa, a memorial constructed at the end of the last century in memory of Dr. John Ludwig Kraft was set aside for protection. Dr. Kraft published the first Kiswahili dictionary in 1850. The tremendous advances made in the Kiswahili language up to the present are largely due to him.



Kipande House in Nairobi is one of the gazetted buildings

Kitale Museum

Kitale Museum Nature Trail

The Kitale Museum, has conserved a portion of the forest next to the Museum for many years as a living exhibit. The forest also serves as a classroom for university students studying biological sciences. The Nature Trail covers 12 hectares of unspoiled indigenous forest representing the vegetation found in the Kitale area before agriculture led to the loss of much of the natural vegetations. Unfortunately part of this forest is threatened because land has been allocated to a private developer.

Tree Planting Project

The Olof-Palme Agroforestry Centre within the Kitale Municipality is a collaborative programme between the VI Tree planting project and the National Museums of Kenya. The goal of the Centre is to demonstrate the agroforestry concept in tangible and understandable ways. This will help satisfy the people's need for firewood, timber, fodder and fruits and contribute to soil conservation. The Centre consists of a demonstration farm, a homestead, a nursery, an office block and an arboretum for indigenous species. A new extension was inaugurated in 1992.



Some seedlings propagated by the Museums

Completed developments elsewhere on the Museum grounds include installation of a biogas energy unit, construction of a crocodile pit and the development of loan boxes of artefacts which the Museum circulates to school classrooms.

Meru Museum

Museum of Central Kenya

A new Museum to be called the Mumbi Museum is planned for Murang'a town. The Museum curator, George Kirigia, led a team of Museum conservators to visit the Muranga District Development Committee to solicit material and moral support for starting a museum for Central Kenya. The DDC resolved to allocate the historic *mukurwe-ini-wa-nyagathanga* (the cradle of the Agikuyu) to the National Museums for the development of a new museum complex. About 6 hectares of land will be transferred from Murang'a County Council who were the trustees of the plot.

John Makokha of the Treasury visited the Museum accompanied by Samwel G. Njoroge, the Museums' Financial Controller for on site familiarization with the proposed projects by Meru Museum.

On the plot is an abandoned hotel building which was under construction.

Collaboration

The twining of Meru and Duncan city of British Columbia, Canada was finalized in early 1991. In July a team of 12 Canadians visited the museum and travelled throughout the district studying Meru culture and social set up. In September 1991 another team of Canadians visited the town to develop plans for cultural exchange programs. The team was led by Alderman Joan Gillat of the city of Duncan.

COASTAL ARCHAEOLOGY

Archaeologists study East Africa's urban origins

In a major increase in coast archaeology activities, the Swedish Agency for Research with Developing Countries (SAREC), has funded establishment of a regional centre for their Project: Urban Origins in Eastern Africa. This project encompasses eight countries, namely: Somalia, Kenya, Tanzania (mainland & Zanzibar), Comores, Madagascar, Mozambique, Zimbabwe and Botswana. The Centre is being developed at the Old Law Courts at Fort Jesus Museum, Mombasa, and the Regional Centre's newsletter, *Mvita*, has started production. Dr. George Abungu, head of the Coastal Archeology for the National Museums at Fort Jesus, is coordinating the Regional Centre.

The Urban Origins Project has, since its inception in 1986, initiated several research projects and financed many learning opportunities for Museum and University staff. In 1990, members of the Department of Coastal Archaeology were joined conservation officers from the Lamu Fort and Fort Jesus in a mapping and survey expedition aimed at covering all coastal archaeological sites between the Tanzanian and Somali borders. During the first phase, all known sites between Vanga, in the south, and Mombasa Island were covered. Small-scale excavations took place at Munge, Shirazi and Diani.

The second phase-joined by one Kenyan and two American university students-was carried out in 1991 and covered all sites between Mtongwe and Takaungu, as well as several in the Lamu archipelago. The team was joined by two Swedish colleagues who brought with them infra-red surveying equipment; this was used to quickly and efficiently map parts of Jumba, Galu, and the Lamu entire town of Pate. Small scale excavations were also carried out at Pate.

Survey of Swahili ruins on the East African coast

Kusimba Makokha, currently in the U.S., and a group of Museum staff from Fort Jesus, surveyed and mapped the settlement of Mtwapa; the resulting artefacts are being used to study iron-working technology and culture change among the Swahili. It is also hoped that Mtwapa can be cleared and conserved as a field school for visiting and local scholars and students under the direction of the Urban Origins Regional Centre.

Staff members from the Department of Coastal Archaeology have curated more than 30 tons of material from the sites of Ungwana, Ndia Kuu, Jumba la Mtwana, Mtwapa and



A historical ruin at the Kenya Coast

Manda. Work on the Ugwana material, gathered by Abungu in 1987, has now been completed. A team from the department supporting staff re-mapped the site to include all the structures within the town wall.

A study of Giriama sacred sites and rituals was carried out by Kalume Tinga, based on field research at Kaloleni, Gede and Bamba. Tinga and Mchulla also supervised the systematic demolition and reconstruction of the leaning Mnarani Pillar; it now stands beautifully straight. The work was made possible by generous funding by Friends of Fort Jesus and the Sumitomo Construction Company.

Athman Lali, together with Museum staff from Lamu and Fort Jesus, carried out small-scale excavations at the site of Mwana, in Kipini. He was also accompanied by Nina Mudida of the Nairobi Museum who compiled a collection of fish bones from the site.

INSTITUTE of PRIMATE RESEARCH

Animal Resources

Animal health care has improved and research activities increased with the recent expansion of the animal facility. The primate quarantine building and the rodent facility were constructed with funding from the European Economic Commission. The quarantine building covers an area of 522 m² and comprises eight animal rooms, six accommodating ten individual baboon cages each and two accommodating 15 individual vervet cages each. In addition, there is a clinic, a surgery unit and two sick animal isolation rooms, a clinical veterinarians office, a staff room, food stores and other essential amenities. The rodent building facility for housing rodents and lagomorphs is designed mainly for breeding specific pathogen-free animals (SPF) and is an essential addition to the research development capability of the Institute.

Primate Medicine.

The Therapeutics Unit continued to monitor and improve the well being of the animals in the Institute. Diverse medical problems were encountered. Both infectious and non-infectious diseases were promptly controlled, including a cutaneous fungal disease and severe shigellosis in the baboons. An in-house parasitology project was conducted for the IPR Parasitology Department. The commonest ailments in the animals were gastrointestinal, followed by trauma cases resulting from fight wounds. An unusual case was an instance of nasal adenocarcinoma in an Olive Baboon, which was successfully treated — a world first.

Ecology and Conservation

The Department coordinates field research on primates by overseas scientists affiliated with IPR. It is also involved in monitoring populations of especially rare

and endangered species, on a long term basis.

Present research focuses on the following areas: monitoring population trends of the endangered Tana River Red Colobus; altruistic behaviour of caged Vervet Monkeys; the foraging strategy and ranging patterns of Sykes Monkeys in Ololua forest; phenological changes of plant species utilized by the free-ranging Sykes Monkeys; the ecology and conservation of baboons in Amboseli Park; baboon endocrinology and behaviour in Masai Mara; baboon paternity and behaviour in Tana River.

The Department also liaises closely with other Departments at IPR and NMK in areas like biodiversity surveys, behavioural aspects of heterosexual transmission of SIV, collection of faecal samples etc.

Behavioural aspects of heterosexual transmission of SIV

Various behavioural attributes that could result in the exchange of body fluids have been systematically recorded among caged Vervet Monkeys at IPR. These included bites, copulation and food sharing (including suckling). The results showed that because the monkeys may engage in a combination of any of these behavioural categories it is difficult to attribute heterosexual transmission of SIV to any specific category of behaviour.

The Mammals of Kenya

The Department was involved in a biodiversity study investigating the current status of mammals in Kenya. Results show that there are about 332 mammals in Kenya belong-



A baboon at the IPR animal colony.

Schistosomiasis Programme

Schistosomiasis represents a serious debilitating disease and is endemic in 76 countries throughout the world. It is one of the most widespread of all human parasitic diseases, ranking second to malaria in terms of its socio-economic and public health importance in tropical and subtropical areas. The fact that it is endemic in Kenya adds further emphasis to its importance as a research area at IPR.

In Kenya, both *Schistosoma mansoni* and *S. haematobium* are present. Although closely related, each presents specific disease manifestations related to differences in their life cycle within the human host.

Baboons as maintenance hosts of human schistosomiasis in Kenya

This WHO - funded study has now been in operation for over five years and has centres on free-ranging baboon troops in Kibwezi Division of Machakos District, an area located mid-way between Nairobi and Mombasa. This area has one of the highest prevalence rates of human infection with *S. mansoni* in Kenya, and there are large numbers of baboons. A parasitological survey of 131 baboons has revealed *S. mansoni* infection in 24%. Some of the worm burdens represent the highest natural infections recorded in wild baboons and their faeces contained viable eggs. The animals' water sources hold large populations of the vector snails *B. preifferi*. Current studies are looking at parasite strain differences and the relative importance of baboons and rodents as reservoir hosts. These investigations illustrate the potential of the baboon to act as a reservoir for human schistosomiasis *mansoni* infection and current studies are geared to investigating potential parasite strain differences and the relative importance of baboons and rodents as reservoir hosts. A control programme of chemotherapy is also underway in the human population.

Immunity to *Schistosoma mansoni* in non-human primate models

Adult human patients in endemic areas acquire an almost complete protection against

re-infection. The immunity protects against both the migrating larval forms and the adult worms. In baboons acquired resistance is manifested by a reduction in adult worm numbers leading to a corresponding reduction in egg output and hence pathology. This immunity is partial in that there is never total elimination of the adult worm population nor is there a disruption or cessation of egg production in the surviving worm pairs. This observation forms the basis of the Concomitant immunity hypothesis whereby adult worms of an established infection can stimulate the host to resist subsequent cercarial challenge completely, but are not themselves destroyed by the immune response.

Acquired resistance can also be induced through a primary challenge of larval parasites attenuated with irradiation. This showed a second possible way towards the development of a human vaccine.

This EEC-funded study is designed to investigate the immunological correlates of protection in the baboon model, as a first step candidate towards vaccine development.

In addition, candidate towards vaccine trials have been carried out on several substances in collaboration with the Institute Pasteur, and the Natural Institute of Health (USA).

Cloning of *Schistosoma haematobium* specific genes

It has been shown that *S. haematobium* and *S. mansoni* possess a wide range of cross-reacting antigens. Since these two parasites can exist simultaneously in endemic areas, it is important to distinguish them both immunologically and genetically so that specific vaccines and diagnostic reagents can be developed for each parasite species. To achieve this end, *S. haematobium*-specific genes coding for surface proteins of this parasite are being identified.

Human and baboon sera have been used

colony animals is reduced compared with newly arrived wild animals in quarantine, the parasite nevertheless is present. We are now recommending that routine de-worming with a broad spectrum anthelmintic, effective against this parasite, is carried out in addition to regular screening using the faecal culture technique. As part of this study, treated and clean animals have been rechallenged with infective larvae and sequential sera samples taken. Analysis of this serum is underway with a view to assessing whether larval antigen can be utilized for serodiagnostic purposes.

Pathogenicity of *Entamoeba histolytica* in nonhuman primates

Entamoeba histolytica (Eh) has a high prevalence (10-35%) among both wild and captive East African primates. The actual and potential pathogenicity of these infections is unknown. While invasive amoebiasis is well recognised in primates, there is now good evidence that symptomless infections may histologically show significant local tissue invasion at necropsy.

Zymodeme studies in man have shown 21 zymodemes, five of which have definite pathogenicity, while the remainder are non-pathogenic. In Africa it is estimated that 10% of all human Eh infections, excluding *E. hartmanni*, are with pathogenic zymodemes. Studies of Eh zymodemes in primates are limited to a few studies in USA and UK with colony-bred or long-term colony residents — their zymodemes were non-pathogenic.

Knowledge of zymodemes status and its clinico-pathological correlation is of practical importance with respect to (1) the need to screen and treat quarantine animals, (2) cross transmission between man and primates in a primate colony setting, and (3) cross transmission between wild primates and man, especially where water supplies become polluted by man or primates. In addition, the outcome spectrum of natural primate infections with pathogenic zymodeme Eh needs demonstration.

Current work has isolated Eh from a number of nonhuman primate species housed

in the IPR colony. In addition, lysates have been prepared by freeze-thaw and characterization is currently underway.

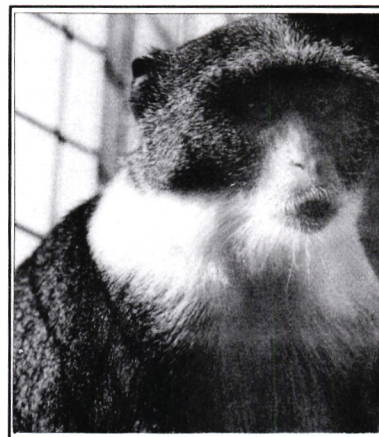
Hydatid disease

Previous studies at IPR have shown that the baboon could be used as an experimental model for *Echinococcus granulosus* infection. Further experimentation has since taken place in the baboon model and now, the Vervet Monkey has also been investigated as an experimental host for development of primary infections.

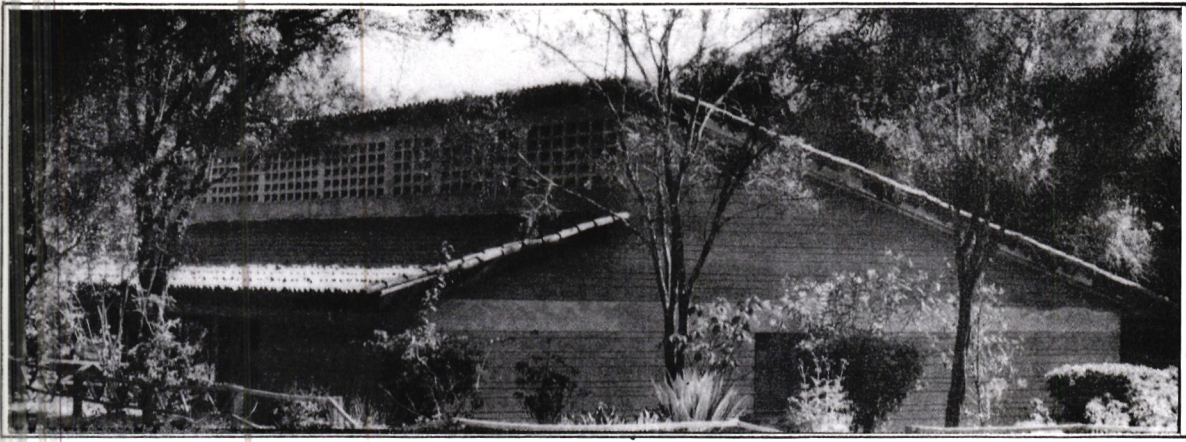
The results suggests that Vervets in particular may be useful to study immunological events associated with exposure, development and resolution of hydatid disease in outbred human populations.

Leprosy

This disease is caused by an acid-fast bacterium *Mycobacterium leprae* and is mainly characterized by lesions of the skin and involvement of the peripheral nerves. Within Kenya, it is a serious health problem, particularly in the west of the country where prevalence is highest. Nonhuman primate models have been established, notably the Rhesus Macaque and the Mangabey. The Vervet Monkey has also been demonstrated to be susceptible to this disease. A nonhuman primate model in East Africa would act as a tremendous stimulus for regional research. In this regard, pilot work has been undertaken to establish a system for investigating the pathology of nerve tissue. To this end primary embryonic cells from the sciatic nerves of both the Sykes Monkey



A Vervet Monkey



One of the buildings at the Institute of Primate Research

In addition to these the Department carries out basic reproductive studies in Vervet, Sykes and De Brazza Monkeys. An example of these studies is the IPR captive breeding programme of Vervet Monkeys.

Occlusion of the vas deferens by 'cured in-place'

Silicone plugs have been experimentally placed in the vas deferens of 20 baboons. Removals of plugs from 15 animals has allowed the reversibility of the method to be assessed.

Identification and isolation of trophoblast-specific antigens

Twelve selected antibodies were screened against a range of baboon tissues to eliminate those that are non-specific. Work has been conducted on embryo recovery procedures and on superovulation; however, the latter has had disappointing results. So far eight antibodies have been screened against pre-implantation trophoblast, and two have shown reactivity.

A multi-centre clinical study in a family planning method

The Institute of Primate Research was involved in carrying out glucuronide assays as a service to the Department of Obstetrics and Gynaecology of the University of Nairobi who are participating in a multi-centre study assessing the reliability of cervico-vaginal fluid volume changes as a family planning method. All assays have been com-

pleted and the results have been communicated to the Department of Obstetrics and Gynaecology.

The Baboon as a model for endometriosis

Endometriosis is an important cause of infertility and pain in women. It occurs naturally only in humans and nonhuman primates. For ethical reasons it is difficult to initiate any clinical studies among women that would precisely determine the cause or progression of the disease. Similarly, properly controlled or invasive experiments can only be performed in nonhuman primates. Many nonhuman primates have a menstrual cycle and spontaneous endometriosis has been described in some of them. Although most studies on endometriosis so far have been done in the Rhesus and Cynomolgus monkeys, the baboon, which is phylogenetically closer to the human, offers many advantages. This includes the fact that the menstrual cycle occurs year round, and its larger size which makes technical aspects of the work easier. At IPR the baboon has been developed as a model for studying endometriosis by Dr Thomas D'Hooghe as part of his Ph.D. thesis under the direction of Dr C.S. Bamba (IPR) and Dr P.R. Koninckx (Dept. of Obstetrics-Gynecology, University Hospital Gasthuisberg, Leuven, Belgium). Development of the Vervet Monkey as a model for natural heterosexual transmission of (SIV).

cretions, embryo secretions and NP40 placental extract.

Specificity studies aimed at determining baboon tissue cross-reactivity were done on liver, heart, intestines and adrenal glands. Some tissue reactivity was observed with the large intestines, adrenal gland and liver.

Cross-reactivity against mouse placenta was also evaluated and three antibodies (51E, 211A and 36B) reacted against trophoblast in this animal.

Passive immunization studies in mice revealed that those mice immunized with mAb 311E recorded some pregnancies whilst those treated with 211A showed no pregnancies.

Use of recombinant DNA techniques for development of sperm-based vaccines

A monoclonal antibody was used to probe antigens from baboon testis and sperm extracts. This monoclonal antibody will now be used to screen a human testis cDNA library.

Isolation and characterisation of a potential sperm-based immunocontraceptive antigen

Infertile human sera from healthy patients was shown to agglutinate and immobilize human sperm. These sera were pooled and used to screen a testis cDNA expression library. On primary screening six positive clones were isolated. A secondary screening will be done to confirm whether these clones are real positives, before undertaking further studies on characterization of the antigen.

Antisperm immunity in the female genital tract of baboons

This first study was done to determine whether levels in sera and genital tract secretion in baboons are influenced by the hormonal changes during normal menstrual cycles.

Characterisation of endogenous retroviral particles in human placenta villous tissues

In the search for novel methods for regulation of fertility, efforts are now being made

to develop a trophoblast contraceptive vaccine. To date, seven priority candidate antigens have been identified that deserve further experimental characterisation as potential trophoblast membrane contragestational vaccine targets.

Expression of intact enveloped type-C retroviral particles is a common and distinctive feature of human and baboon syncytiotrophoblast in the first trimester of normal pregnancy, but the biological roles of these particles are not well understood. This study focused on immunochemical, biochemical and electron microscopic characterisation of endogenous retroviral particles in human placental tissues, with a view to understanding their biological function at the maternal-foetal interface. In order to investigate the biological role of these endogenous retroviral (proviral) sequences in placental tissues, the central requirement was the development of specific antibody and molecular (DNA) probes. Techniques were developed for isolation of endogenous retroviral particles from placental villous tissue using sucrose gradient centrifugation, and monitoring of specific reverse transcriptase activity.

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The Financial Reports of the

NATIONAL MUSEUMS of KENYA

for the year 1991 - 92

The AUDITOR-GENERAL (CORPORATIONS)

**Report on the Accounts of the National Museums of Kenya
for the year ended 30 June, 1992**

I have examined the accounts of the National Museums of Kenya for the year ended 30 June, 1992 in accordance with Section 29 (2) of the Exchequer and Audit Act (Cap. 412). I have obtained all the information and explanations that I have required for the purpose of my audit. Proper books of account have been kept by the Museums and the accounts are in agreement therewith.

In my opinion, the accounts, when read together with the notes thereon, give a true and fair view of the state of financial affairs of the Museums as at 30 June, 1992 and of its surplus and source and application of funds for the year ended on that date.

A. J. Okoth
Auditor-General (Corporations)

15 January, 1993

SOURCE & APPLICATION OF FUNDS for the Year Ending 30 June, 1992

SOURCES OF FUNDS	1992		1991	
	K. £	K. £	K. £	K. £
Income for the year		(3,255,485)		(1,307,739)
ADD BACK ITEMS NOT INVOLVING MOVEMENT OF FUNDS				
Depreciation for the year		<u>213,571</u>		<u>188,876</u>
Net Income from Museums Operations		(3,041,914)		(1,118,863)
ADD FUNDS FROM OTHER SOURCES				
Grant-in-Aid Recurrent		2,529,493		1,800,000
Grant-in-Aid Development		41,600		46,600
Project Revenue		<u>1,354,895</u>		<u>0</u>
		884,074		727,737
LESS APPLICATION OF FUNDS				
Purchase of motor vehicles		120,840		128,869
Purchase of Equipment		<u>200,260</u>		<u>73,592</u>
		<u>562,974</u>		<u>525,276</u>
INCREASE OR DECREASE IN WORKING CAPITAL				
Increase in Stock	34,830		(69,795)	
Decrease in Debtors	(22,432)		13,783	
Increase in Creditors	<u>(351,032)</u>	(338,634)	<u>(27,123)</u>	(83,135)
INCREASE OR DECREASE IN LIQUID FUNDS				
Deposits in Financial Institutions	(517,806)		438,369	
Increase in Cash at Bank	<u>1,419,414</u>	901,608	<u>170,042</u>	<u>608,411</u>
		<u>562,974</u>		<u>525,276</u>

GENERAL FUND ACCOUNT as at 30 June 1992

	1992 K.£	1991 K.£
TOTAL INCOME (Appendix 1)	6,429,957	4,797,172
LESS EXPENDITURE		
Recurrent (Appendix 2)	5,694,827	4,209,010
Development (Appendix 3)	<u>64,627</u>	<u>49,301</u>
	<u>5,759,454</u>	<u>4,258,311</u>
Excess of Income Over Expenditure	<u>670,503</u>	<u>538,861</u>
Balance as at 1st July 1991	1,653,356	1,114,495
Excess of Income over Expenditure	<u>670,503</u>	<u>538,861</u>
Balance at 30th June 1992	<u><u>2,323,859</u></u>	<u><u>1,653,356</u></u>

APPENDIX II. Expenditure Report Classified by Class and Item Group for the Period from July, 1991, through June 1992.

DESCRIPTION	TOTALS												
	Nairobi Museum Kf	Kitale Museum Kf	Fort Jesus & Coastal Kf	Other Museums Kf	Primate Research Kf	Leakey Building Kf	Kenyatta House Kf	Prehistoric Sites Kf	Herb- arium Kf	Koobi Fora Kf	Museum Projects Kf	FY 91/92 Kf	FY 90/91 Kf
ADMINISTRATION													
Pers. Emolument	1,056,343	77,549	400,440	131,191	552,558	187,392	7,381	63,513	91,353	39,276	745,563	3,352,559	2,560,484
Transport Operating	45,185	5,180	17,984	11,809	23,387	1,322	0	2,815	356	8,337	53,788	170,163	181,097
Travelling. Accom.	39,924	1,588	21,744	4,533	6,427	1,346	292	7,616	862	4,506	68,975	157,813	167,656
Air Fares & Aircraft	7,150	0	3,044	0	848	333	0	0	0	0	36,234	47,609	30,884
Entertainment	12,764	298	1,961	718	965	0	0	0	0	0	4,638	21,344	13,667
Printing/Stationary	60,246	2,953	22,320	5,635	15,565	6,224	660	3,640	3,427	6,375	20,938	147,983	72,347
Postage/Telecom.	95,451	4,057	36,993	5,003	23,458	142	0	58	805	5	11,828	177,800	108,080
Consultancy Services	2,357	0	275	0	607	0	0	0	0	0	8,070	11,309	18,302
Advertising	9,447	0	3,596	419	2,960	0	0	77	0	0	28	16,527	11,699
Subscriptions	2,294	0	850	0	2,129	6,748	0	0	0	0	0	12,021	4,082
Audit Fees	5,000	0	0	0	0	0	0	0	0	0	0	5,000	5,000
Computer Services	10,554	0	32	0	1,102	942	0	0	115	0	562	13,307	6,390
Bank Charges	7,726	791	1,929	737	4,481	0	0	0	0	0	598	16,262	12,627
Loss of Cash	1,833	0	0	0	1,275	0	0	0	0	0	0	3,108	0
Sundries	4,382	1,029	4,233	1,022	1,303	0	0	0	0	0	5,076	17,045	12,253
Subtotals	1,360,656	93,445	515,401	161,067	637,065	204,449	8,333	77,719	96,918	58,499	956,298	4,169,850	3,204,568
ESTABLISHMENT													
Rent & Rates	120	0	50	160	233	0	0	0	0	0	57	620	2,705
Electricity & Water	39,861	1,589	29,221	3,388	26,112	0	5	206	0	0	16,432	116,814	113,083
Insurance	71,307	0	0	38	23,818	0	0	0	0	0	8,172	103,335	62,525
Minor Works	17,877	4,249	29,754	8,129	14,152	685	0	1,864	118	310	87,797	164,935	184,965
Maint. of Furniture	41,584	1,976	16,502	2,654	22,968	7,703	67	3,010	326	1,515	18,039	116,344	106,512
Depreciation	213,571	0	0	0	0	0	0	0	0	0	0	213,571	188,876
Subtotal	384,320	7,814	75,527	14,369	87,283	8,388	72	5,080	444	1,825	130,497	715,619	658,666
EQUIPMENT, EXHIBITS & RESEARCH													
Exhibit Expenses	0	836	562	1,294	0	0	0	0	0	0	13,842	16,534	5,420
Animals/Specimens	2,835	845	0	1,681	2,462	0	0	0	0	0	1,400	9,223	12,153
Animal Food/Surgery	4,864	639	1,360	1,868	15,569	0	0	0	0	0	40	24,340	26,189
Laboratory/Research	344	0	0	0	35,002	0	0	0	0	0	10,331	45,677	34,836
Chemicals	10,105	0	9,346	416	4,643	302	0	250	638	0	2,551	28,251	12,555
Photography	3,833	196	2,538	264	502	2,600	0	0	0	0	3,101	13,034	12,563
Freight Charges	4,576	0	546	234	27,093	21	0	0	18	0	22,372	54,860	64,444
Consumables	26,812	2,452	7,840	4,158	14,919	480	156	3,402	388	422	5,653	66,682	55,727
Library Books	114	328	1,950	500	5,934	35,345	0	0	0	0	46,104	90,275	32,514
Furniture/Equipment	5,886	143	5,884	257	4,052	1,937	0	841	59	549	157,419	177,027	54,343
Motor Vehicle	0	0	0	0	27	0	0	0	0	0	0	27	0
Royalties	6,203	0	0	0	0	0	0	0	0	0	0	6,203	35,032
Items for Resale	204,324	2,822	61,901	4,579	1,664	0	0	135	0	0	1,800	277,225	0
Subtotal	269,896	8,261	91,927	15,251	111,867	40,685	156	4,628	1,103	971	264,613	809,358	345,776
TOTALS:	2,014,872	109,520	682,855	190,687	836,215	253,522	8,561	87,427	98,465	61,295	1,351,408	5,694,827	4,209,010

NOTES ON ACCOUNTS FOR THE YEAR ENDED 30 JUNE, 1992

ACCOUNTING POLICIES

Basis of accounting

The accounts are prepared under the historical cost convention.

Grants

Government grants are credited to the income and expenditure account on the basis of the payments made by the Government of Kenya.

Value of Fixed Assets

As an accounting policy, no value has been placed on land, buildings, exhibits, study collections and fixtures. The land and buildings are Government property and at the same time Museum exhibits have no commercial value, the study collections being priceless. The Museums are, however, registering other fixed assets and incorporating them in accounts at book value.

Purchase of Animals

Purchase of primates and reptiles are charged to the income and expenditures account at the time of purchase.

Stocks

Stocks are stated at the lower cost and net realisable value.

Projects Funds Income

These are funds earmarked for specific projects mostly dealing with research in particular areas. The projects funds are credited to a deposit account when received and only transfer the amount spent each month to income. In this case, the income and expenditure are always the same. The balances remain in the respective deposit accounts.

