Chagga grass house and new style house, 1970s.

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The Chagga of Kilimanjaro
SALLY FALK MOORE

Sally Falk Moore is Professor of Anthropology, Curator of African Ethnology in the Peabody Museum, Master of Dunster House, Dean of the Graduate School of Arts and Sciences, and Fellow of the American Academy of Arts and Sciences. She graduated from Barnard College, and received a Ph.D. in anthropology and an LL.B. from Columbia University. A specialist in legal and political anthropology who has done fieldwork in East Africa, she came to Harvard in 1981, where she teaches in the Faculty of Arts and Sciences and in the Law School. Her books include Power and Property in Inca Peru (1958), Law as Process (1978) and Social Facts and Fabrications, “Customary” Law on Kilimanjaro, 1880-1980 (1986).

Mount Kilimanjaro, the highest mountain in Africa, has long been an object of curiosity. Visible at certain times of the year from many miles away, its snowy peak, called Kibo, seems an oddity from the heat of the African plain. The first European visitor to the mountain was a German missionary named Rebmann who arrived in 1848. At that time, Kilimanjaro was a well-known stopping place for Swahili trading caravans from the coast. So accustomed were the Chagga inhabitants of Kilimanjaro to traders that they were not shy about expressing their disappointment when the missionary told them that all he had to offer was the wisdom in his Bible. Rebmann had a simple, climate-based explanation of the Wachagga’s own religion. “All the time of my residence in Jagga it rained in torrents almost every night on which account the sun is welcome to the inhabitants and is their god” (Krapf, 1860:239). Such were the patronizing interpretations of African religions in the nineteenth century.

Visitors from as near as Germany and as far as Japan still find their way to Kilimanjaro in numbers. But they have much less interest in the Chagga than Rebmann had. Tourism and mountain climbing are the new attractions. The more intrepid visitors hike to Kibo peak, with African guides to show the way, and African porters to carry their food and blankets, three days up and two days down. On the normal trail there is no rock climbing nor other arduous terrain to traverse. It is all a matter of following a path up and up and up, through thinner and thinner air. The shift in the oxygen level and the progressively increasing cold are what make the climb difficult for about half the visitors, not the terrain itself. The climb itself is not difficult.

The African people who live on Kilimanjaro, the Wachagga as they call themselves, or Chagga, as they are usually called in English, do not climb the mountain. From their perspective it is an unrewarding exertion, and they have no warm clothes to protect them from the extreme temperatures. Unlike the office-sitting Europeans, Americans and Japanese who exercise for pleasure, the Chagga have all the exercise they can manage in the ordinary course of life. There are a few buses rolling along on the central dirt roads that ring the mountain. However, in proportion to the tiny annual cash income available to most Chagga farmers, the buses are too expensive for them. Bus transportation is used largely by white collar workers, usually for trips to the town of Moshi, twenty-five or more miles away. Of course, most of the farmsteads are not on the main road and can be reached only by walking up or down the myriad narrow dirt paths that twist and turn in and out of the banana and coffee gardens. For this network there are no guide maps. On them shank’s mare is the only possible form of transportation.

The Chagga walk great distances every day to attend to ordinary needs. Market days see large processions of women on the roads. For the most part, the water and the wood and the food needed by each household are still carried as head-loads by women. To go on any errand, or to visit his friends, to go to the courthouse, to go to the beer shop, a man, too, must walk substantial distances. At the appropriate seasons, men and women must go far downmountain to cultivate extra fields in the lower areas and on the plain. Buses are not for such farm workers. I remember once, early in my stay, when I took an exploratory walk on one of the many paths that wind in and out of the Chagga homesteads, I met some local people who asked me, as is their habit with strangers, where I was going. I replied that I was not going anywhere, I was just taking a walk. “But where are you going?” they insisted. From their perspective, I was clearly being evasive. I must have concealed motives. No one would go for a walk without a destination. That was ridiculous.

These people who live on Kilimanjaro all their lives, the Chagga to whom the mountain really belongs, are hardly visible to tourists. Today, there are more than half a million of them, but visitors climb the mountain, hardly having noticed them or touched their way of life. They are not on exhibition. Their houses are often hidden from view, centered in the
midst of their gardens. Even the perimeter of the banana-coffee gardens is protected and marked by a concealing, living fence of dracaena. The dracaena fence not only adds to the privacy of each resident household, it is also a legal boundary — marker of importance. Law and economy are closely intertwined on Kilimanjaro where land is scarce these days, and rights to land are energetically defended.

Chagga land law touches on everything from kinship relations to political structure. Most arable land high on Kilimanjaro is permanently occupied and inherited by individual men from one generation to the next. But an heir who is done out of his inheritance must turn to someone in political power to help him to get his due. And from time to time, the politically powerful have not been above using their positions to acquire land for themselves or their relatives or cronies. Thus an inquiry into land law of the Chagga, one discovers that acute land shortage is a thing of the past fifty years. A scarce resource that the Chagga used to quarrel over more than they do now are cattle. Their laws about cattle are very detailed and elaborate. Cattle, after all, are a remarkably productive interest-bearing investment. A cow produces a calf a year during her fertile years. In many parts of Kilimanjaro adequate pasture land was not available in the banana belt. Hence cows were (and are still) stall-fed. The women regularly went down to the plain to collect huge head-loads of grass which they then carried upmountain to feed their animals. Thus no household could take care of more than an animal or two unless, like the chiefly households of yesterday, they had access to large amounts of extra labor. In former times there was, however, another way to take care of extra beasts. Extra animals could be placed with families that had no cattle, to be cared for by them, or they could be placed with hired herdsmen down on the plain, to be pastured, and looked after. Now there are socialist cooperative herds on the plain. The terminology has changed but some of the realities are the same.

Cattle loaning agreements, and even goat loaning contracts were and are elaborate. At the turn of the century wealthy Chagga men often had beasts scattered in numerous households. Cattle were more than slightly desirable. They not only were slaughtered and eaten on all major occasions when agnates assembled, they were necessary for bridewealth.

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payments, essential for funeral sacrifices and as payments for numerous debts and obligations. Transformed versions of all of these customs exist today. Lineage slaughtering feasts at which the men assemble are still the high points of the year in lineage affairs. Thus an examination of the laws and practices relating to cattle payments, cattle loaning and cattle inheritance leads one into the history of the present law of marriage, divorce, and compensation for wrongs and injury. It leads to an understanding of past and present forms of ritual and sacrifice. Cattle are not only valuable material objects, beasts are at the very core of Chagga symbolic exchange.

A third great resource of the Chagga was and is water. For as long as anything has been known of them, Chagga have tapped into streams from the high forest, dug narrow canals, and created irrigation channels all over the mountain to water their gardens and groves. In the old days each water using group generated its own elaborate set of rules about the order in which water was to be used, how it was to be distributed, who was responsible for the work of cleaning and maintaining the canals and the like. The canal users as a group enforced their own rules and performed the necessary rituals to keep the waters flowing. Local Party organization now organizes the servicing and use of the canals.

Last and most important of the resources available to the Chagga was and is labor. Neither land nor cattle nor water had any value if there were no people to work the land, herd the cattle, and use the water. The question who controlled whose labor was central to the social and political system. Was a son’s labor in his father’s control? And to what age was that so? A daughter’s labor? Could a kinsman call his male relatives to help him clear a field or build a house? And under what circumstances could a chief muster the labor-power of his people for anything from canal building and agricultural work to military fighting power? Since the control over labor is also connected with household organization, rights to labor and rights to the reproductive capacities of women are intertwined. Marriage, sexual relations and work are closely interconnected in an economy in which the household is a basic productive unit. Obviously, the question who had what rights to the labor of others can be put as a legal question that resonates with other questions about the social and political organization of a society. As in any other society, the changing organization of labor in Chagga society provides an avenue for the understanding of the historical transformations in the general system of control.

Thus my inquiry into the customary law of the Chagga was not conceived as many recent anthropological studies of law have been, simply as a study of their modes of dispute resolution. I was interested in something very much broader, a picture of their ordinary practices and ideas surrounding the control of property and persons, a picture that would include disputes but not make disputations the only focus. I was using law to do ethnography, and using legal records to construct an ethnographic history.

That, in turn, has led me to address sets of problems that are part of a contemporary theoretical and methodological transformation in anthropology. During the pre-World War II period ethnography tended to be conceived of as an account of the indigenous customs of the people studied. There was a deeply imbedded assumption in anthropology that above all what the ethnographer was trying to decipher was the character of local tradition. Each ethnographer was trying to discover the deep structure of one more instance of the great variety of social and cultural forms which human beings had created. To that typologizing project recently introduced changes of western origin were irrelevant. The task at hand was to reconstruct the original, unsullied culture. This attitude was reinforced among many of the peoples studied by the absence of writing and hence of recorded history. The stance of the ethnographer was further legitimized when, as often was the case, the people studied also insisted on the antiquity of their traditions, and the previous stability of the old ways of life.

Colonial governments often had a similar view of the practices of their subject peoples. A streak of evolutionaryism was evident in the idea that native peoples had somehow become locked into an earlier stage of social development. Such ideas certainly helped to legitimate colonial rule just as they helped to legitimize missionizing. The colonial powers had good practical reasons to allow their subject peoples to continue to use their own “customary law” where these were not contrary to colonial policy nor to European conceptions of morality. One practical reason was that a colonial government could not possibly know of, let alone change, whole systems of indigenous practice overnight. Given the small administrative staffs they had, the colonial rulers were not in a position to design and enforce any innovations that were not seen as absolutely necessary to their own immediate enterprise. Moreover, they had no reason to interfere in what they perceived as purely domestic folk affairs.

From time to time the colonial governments used missionaries and later anthropologists to record “customary law.” Their purpose was to make it possible to enforce that “law” correctly in the colonial courts when questions of custom came before them. Even as independence arrived in the 1960s, there were still ongoing projects to make a written record of African “customary law” systems in which some anthropologists were involved. A notable one was run by Professor Allott at the University of London. The idea was not only that an authoritative codified list of local customary laws could form the basis for sound interpretations by the courts, but that such a list would close the gap between the “new” and the “old” legal orders by incorporating the old into the new.

What is interesting about these efforts, and indeed about much that missionaries and anthropologists have written about “customary law” altogether, is that there is an underlying assumption involved in these projects that such law is ancient custom, that law is tradition, that law is fixed, at least when it comes to “native” law. There is an implicit assumption...
that, of course, “modern” societies have legislatures and courts through which innovations may be promulgated or implemented, but that somehow the “natives” are stuck in their traditional ways. What my study of Chagga legal history has made evident is that many of these assumptions are false. Inspected over the course of a century, Chagga history and ethnography shows how “customary law” was constituted during colonial times and the way in which that law changed steadily while being constantly and vigorously identified as the epitome of tradition.

The Chagga presented a unique opportunity for this kind of study. It happens that early in this century the German colonial government which ruled Kilimanjaro (from 1896-1915) appealed to its outlying missions and outposts to collect information on native law. A questionnaire was sent out and answers returned from many parts of the German empire. But it also happened that on Kilimanjaro, there was a remarkable Lutheran missionary named Bruno Gutmann, who thought the questionnaire inadequate. He discarded it and in a voluminous series of writings answered many more questions than the government form had ever contemplated (Gutmann, 1926; see also Winter, 1979). He learned to speak Kichagga, and made good use of the language for scholarly purposes beyond his immediate missionizing role, since he had a strong streak of the ethnographer in him. He found a group of Chagga elders from whom he learned a great deal about pre-colonial practice, and he also got a great deal of help from a Chagga teacher who wanted to record the history of his people. Gutmann’s material, not published until 1926, but most of it collected much earlier in the century, is not only a historical reconstruction of 19th century affairs, but also includes comments and observations on what was going on around him while he was on the mountain (from 1902-1920).

Together with missionary and travellers’ accounts from an earlier period, Gutmann’s material pro-
vides a base-line from which to make comparisons with later information. Administrative reports and court records abound from the British colonial era (1916-1961). Fieldwork I undertook intermittently for many short periods from 1968-1984 affords the necessary experiential view and much detail omitted in the official accounts. From individual Chagga I heard both retrospective accounts of earlier times and lively arguments that showed the current active uses of "customary law." Of paramount importance was the unofficial story of what was (and is) going on outside the courts. What was and is happening in the courts is only a small part of the uses of law.

When all of the available historical and ethnographic information is put together, what emerges is a picture of a continuously shifting economic, political and social scene on Kilimanjaro to which local law was continuously adapting. The initial major surgery performed on the Chagga "customary law" system was effected by the colonial presence itself. The very existence of the colonial government put severe limitations on the authority of indigenous rulers and fundamentally changed indigenous legal arrangements. Certain deep economic changes also followed. Coffee cultivation and a cash economy were introduced. There were consequent alterations in the nature of property and power, and deep changes in the content of relationships, normative rules and local practices. But despite these changes, the Chagga, successive colonial governments and the post-colonial independent government, have all continued to recognize the existence of a thing called "customary law." That construct has served all of their purposes, but the time has come for anthropologists and historians to make explicit the fact that the term conceals as much of change as it seems to reveal of continuity.

In what ways did "customary law" change for the Chagga from 1880 to 1980? What was life like before the Germans settled in as rulers? To begin with, as indicated earlier, in the 19th century, Kilimanjaro was not an isolated tribal area. However remote it may have looked to European explorers as a standard way station on the regular caravan routes from the East African Coast inland, Kilimanjaro not only participated in the ivory and slave trades, but in many other forms of short and long-distance trade. People have marvelled at the business acumen of the Chagga in their adaptation to the commercial ways of the twentieth century. There was a strong historical background for this. Not only were the Chagga actively involved in trade long before Europeans arrived, they were also in the provisioning business. Nineteenth century caravans were often miniature armies, comprising sixty to several hundred men. The numbers were necessary not only to carry but to protect the trade goods from raiders. From time to time caravans going inland needed to rest and reprovision. They did so both during the long journey inland from the coast and on their way out when they had new trade goods to defend. Several of the Kilimanjaro chieftoms offered the caravans protected camp grounds high on the mountain, safe from the attacks of marauders, as well as ample food and drink, both to enjoy while camping on Kilimanjaro's territory, and to carry on the rest of the journey.

During this nineteenth century period, there were innumerable raids and wars among the many Chagga chieftoms on the mountain and fights with neighboring peoples as well. One can only surmise the cause at this late date. But whatever the more proximate precipitating factors, it seems reasonable to infer that the deep cause of chronic warfare was the competition to control access to the long distance trade. There were also, of course, immediate ancillary gains from raiding, captive cattle, captive humans who could sometimes be held for ransom, iron implements such as spears, knives and hoes, and an occasional ivory tusk.

What happened to this fighting, raiding, trading and caravan provisioning when the German colonial government defeated the Chagga in a series of battles and took control in 1886? Very rapidly there was a total transformation. Warfare was outlawed. The military age-grade was disbanded. The ivory trade was taken over by Europeans. The old caravans stopped plying their routes. The power of the chiefs came to depend on cooperation with Europeans. If they did not collaborate they were deposed, in the early days even hanged. But the Europeans also needed the Africans. The Germans and later the British badly needed African labor to build houses, roads and government buildings, to work in their plantations and other enterprises, and to grow their food. But the Africans had no reason to work for Europeans, and would not have come forward had they not been forced to do so. The means of forcing them was a hut tax that obliged them to work for cash. At first, the Chagga had no way of obtaining money other than working for Europeans. But it was not long before they realized that they could grow coffee in their banana gardens and sell it to local traders. They saw the European planters doing just that, and they saw the missions doing the same.

Early in this century the Chagga began to plant coffee in their own individual banana gardens and sold it. They had found a solution to their tax problem, and it was a solution that fit within the framework of their existing system of landholding. They grew the coffee they sold in the very same gardens in which they grew the food they ate. They were able to place the new cash crop in interplantings with old subsistence crops. Many went on cultivating the very same plots of land that their fathers and grandfathers had occupied. Thus not only were their subsistence patterns continued, but their settlement patterns were not disrupted.

It was and is the Chagga ideal for all the male descendants of one grandfather or great-grandfather to live in contiguous garden enclosures. These geographical clusters of related men (together with their wives and children) formed localized patrilinesages. These still exist in the older areas of settlement. Male kinsmen rely on each other in every way. They help each other in any heavy work that requires groups of men: house building, clearing trees, bringing in a maize harvest and the like. They
celebrate all the great moments of life together, the feast days, the marriages, the births. And they mourn their common dead together, and inherit responsibility for the deaths of their own male relatives. So while a man owns his own land and can hand it on to his sons, he cannot give it away or sell it without consulting his kinsmen. All of that is still true today, so that in these respects the legal norms look stable. But the meaning of the land itself has changed. It is an object in a changed economy. In the nineteenth century there was more land than anyone needed or wanted. And there was no market for land. Now there is not enough land, and land can be bought and sold.

What caused the present shortage? During the colonial period a great population growth took place. In 1900 there were about 100,000 Chagga. By 1978 there were 500,000. Whatever the causes, this tremendous population increase, plus the withdrawal from food production of all the coffee-bush land, has caused an acute land shortage. Almost every habitable piece of land on the mountain is now occupied. The settled area has expanded virtually to the limit both upmountain and downmountain. The land shortage has been felt for many decades. Some Chagga have moved away to the cities or to other rural areas. All see that education for their children will provide alternative ways of making a living and a remarkable group of Chagga have sent their children to secondary school and beyond. But nevertheless most remain relatively uneducated farmers, subsisting largely on what they and their wives can grow in their gardens.

These land-short Chagga farmers are caught in a bind. A lot of their land is used to grow coffee. They could feed themselves better if they pulled up the coffee bushes and grew more food instead. But if they did that, most rural farmers would have no means of obtaining any cash and the government would lose an important means of obtaining foreign exchange. After a hundred years of greater and greater commitment to a cash economy, to buying cloth and knives and hoes and food grown in other regions of the country, and today, to desiring shoes, and watches, and transistor radios, the Chagga understandably find it impossible to turn back and give up coffee growing. (Indeed, in recent times the government has even made it illegal to do so.) But those for whom coffee is the only road to cash and modern goods are very vulnerable to the ups and downs of world coffee prices. They are dependent on a market whose prices they cannot affect. And with their population increase their vulnerability has become extreme.

For ordinary Chagga farmers there is no solution but to scratch a living from ever smaller plots of land, which with each generation are divided among more and more persons. This has had some very sad and curious effects on the patrilineages themselves, and on contention and litigation within them. The only Chagga who are still well off are those educated persons who not only have a family coffee-banana garden, but who also have salaried jobs in local institutions or in the ever-growing bureaucracy. These are the teachers, the dispensary attendants, the agricultural inspectors, the veterinary service people, the officials of the coffee cooperative, the Socialist Party bigwigs. These are the people on Kilimanjaro who have salaries, tiny salaries by American standards, but there, they are the rich people. They are the people with shoes and watches and transistor radios. They are the people who can afford to take buses, and who can afford to be the pillars of the Church and the Party. They are the people who can hire land-poor Chagga to do the heavy work on their plots while they are away at their jobs in town.

In every localized patrilineage, in every local settlement of brothers and male cousins and second cousins and their wives and children, there are some rich kinsmen with jobs and many poor kinsmen without. When a poor kinsman has a few pennies, the only pleasure he can afford is a calabash of local beer. And even that may be beyond his means when he must clothe himself and his wife and children and pay fees to local clinics and schools. What he does when he is hopelessly short is to borrow money. One might think that such a poor man would be thought a bad risk for a loan and would have trouble getting one. But it is just the opposite. A man who needs a loan can find innumerable lenders. His "rich" brothers rush forward and press themselves upon him. And his "rich" neighbors do the same. Why?

They rush in because the only security he can offer is his interest in his land. To be sure, he can pledge to pay back over time with the total cash income from his coffee crop. But he is almost bound to fall behind in such payments because he and his family cannot afford to live without any bought goods or bought food. That makes his wealthy brothers and neighbors all the more solicitous. They want to lend him more. They compete with one another to be the principal creditor. The brother or neighbor whose loan is accepted wants the debt to become so large that he can foreclose and send the poor brother and his family away. The relatives may begin by being sympathetic to the debtor and may have a genuine wish to help him out. As it becomes clear that he will not be able to pay, the debtor becomes more and more angry, more and more alienated from his agnates, and they in turn lose patience and sympathy for him. He turns ungrateful and they turn into predators. What often happens over time is that the borrower becomes angry with the pressure on him. He feels that it is not fair that his brothers are well off and that he is poor. He begins to cheat on his payments and does not give all his coffee money to his creditors. There may be other disagreements. And over a period of years the debtor may well come to have a bad reputation, and come to be seen as irresponsible, as not meeting family obligations, as a bad character. At that point the lender no longer feels guilty about forcing the issue and taking the land.

When that point comes there may

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Scholars, symposia, and seminars

Department of Anthropology

Peter Ellison, Assoc. Prof. of Anthropology organized and chaired a symposium on “Human Salivary Steroids” at the annual meeting of the American Assoc. of Physical Anthropologists held in New York in April. Prof. Ellison was interviewed in the American Scientist, Vol. 75, 1987. He is currently doing research on the ecology of human reproduction.

Dr. Peter C. Frumhoff is a Visiting Lecturer in the Department of Anthropology. He is currently doing research on the dynamics of cooperation and competition within honeybee colonies — a model system within which to test theories of social evolution and to compare them to the social organization of other animal societies. Dr. Frumhoff is the author, with B. Waldman and P. Sherman, of “Problems in kin recognition” which will be published in a forthcoming issue of Trends in Ecology and Evolution. “The social consequences of honeybee polyandry: the effect of kinship on worker interactions within colonies” was co-authored with S. Schneider in Animal Behavior Vol. 35. Dr. Frumhoff gave a lecture on “Social Consequences of Polyandry in Honeybees” at the XX International Ethological Congress held in Madison, Wisconsin. “Kin selection and kin recognition” was the title of a paper presented at a Symposium on Kin Recognition in Social Insects at meetings of the Entomological Society of America held in Reno, Nevada.

William W. Howells, Prof. Emeritus gave a paper entitled “Micronesia to Macromongolia: Micro-Polynesian Cranioometrics and the Mongoloid Population Complex” at the Micronesian Archaeology Congress held in Guam in September. “Hooton’s Anthropology” was the topic of a paper presented at the annual meeting of the A.A.A. in Chicago at a Symposium to Honor the Centennial of E.A. Hooton. Prof. Howells continues his analysis of cranial material for publication of a second monograph to follow Cranial Variation in Man, 1973, Peabody Museum Papers, Vol. 67.

Prof. Arthur Kleinman delivered the keynote address at the first national meeting on Medical Anthropology held in Tokyo in December. Prof. and Mrs. Kleinman were resident scholars at the Rockefeller Foundation Study Center in Bellagio, Italy during June and July of 1987. The Illness Narratives: Suffering, Healing and the Human Condition will be published by Basic Books, New York in February, 1988. An April, 1988 date is set for the publication of Rethinking Psychiatry: From Cultural Category to Personal Experience, Free Press, New York. Prof. Kleinman is currently co-chairing a Harvard Faculty Seminar on Personality in China, Japan and India. The seminar is supported by the Mellon Fund.


Prof. David Maybury Lewis gave a lecture entitled “Tomorrow’s Children” to open the new International Center at the Smithsonian. He participated in a conference at the Smithsonian on “The Violence of the Conquest.” “Estrutura e Estragegians” was the title of the Distinguished Lecture given by Prof. Maybury-Lewis at the Brazilian Anthropological Association meetings in Curitiba, Brazil. The Proceedings of the meetings have just been published in Portuguese. Prof. Maybury-Lewis is working on a study of the Indian question in Latin America.

Prof. Sally Falk Moore was awarded the Barnard Medal of Distinction in May, 1987. She chaired the American Ethnological Society invited session on “The Author Meets the Critics,” and was a commentator for the session on “Agrarian Africa”. At the Visual Anthropology Conference held in Jodhpur, India (Dec. 87-Jan. 88) she gave a paper entitled “The Production of Cultural Pluralism as a Process,” “Legal Dilemmas in Processual Ethnography” appeared in the American Ethnologist, Vol. 14, No. 4, Nov. 1987.

Pauline Peters, Asst. Prof. of Anthropology at the Harvard Institute for International Development presented a paper on "The Grazing Lands of Botswana and the Commons Debate" at the Conference on World Environmental History, held at Duke Univ. last spring. She participated in a panel on "Range and Water Management in Southern Africa" at a meeting on Rural Resource Systems in Africa held at Berkeley in October. The meeting was sponsored by the Berkeley-Stanford Joint Committee on World Environmental History, Lands of Botswana and the Commons Debate" at the Conference on World Environmental History, held at Duke Univ. last spring. She participated in a panel on "Range and Water Management in Southern Africa" at a meeting on Rural Resource Systems in Africa held at Berkeley in October. The meeting was sponsored by the Berkeley-Stanford Joint Committee on World Environmental History, Lands of Botswana and the Commons Debate," in The Question of the Commons, B.J. McCay and J.M. Acheson (eds.), Univ. of Arizona Press, 1987. She is guest editor, with Prof. Jane I. Guyer (Boston Univ.) of a special issue of the journal Development and Change on "Conceptualizing the Household: Issue of Theory and Policy in Africa." From June 86 - Jan. 87 and June 87 - Sept. 87, Prof. Peters was in Malawi directing an interdisciplinary research project on the problems of crop production and sales, food consumption and nutrition among smallholder farmers.


Pilbeam has been appointed Associate Dean for Undergraduate Education. He will advise Michael Spence, Dean of the Faculty of Arts and Sciences about the undergraduate curriculum and help departments identify and solve any curricular problems in their undergraduate programs.

Gordon R. Willey, Senior Prof. Emeritus attended the Dumbarton Oaks Conference on Lower Central America held in Washington, D.C. in October. He is the author of Essays in Maya Archaeology, Univ. of New Mexico Press, 1987. Prof. Willey is continuing his work on the Copan monograph.

Meadow and Rudner join faculty

Richard H. Meadow

Richard Henry Meadow, Director of the Zooarchaeology Laboratory at the Peabody Museum, has been appointed Lecturer on Anthropology. Dr. Meadow received his undergraduate and graduate education at Harvard (B.A. Magna cum laude, 1968, Ph.D. 1987). He was elected to Phi Beta Kappa in 1968.

Dr. Meadow's primary fields of interest are the archaeology of the Middle East and South Asia, faunal analysis, domestication of plants and animals, and the development of complex societies. He has done field work at a number of archaeological sites including: Hell Gap, Wyoming, Tepe Yayha, Iran; Balakot, Pakistan (Asst. Director and Mammalogist); and Mehrgarh, Pakistan. In addition he has con-

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David W. Rudner

David W. Rudner was appointed Assistant Professor of Anthropology with primary responsibilities in the social anthropology wing. He is a graduate of Reed College (B.A. 1974) and earned the Ph.D. in Anthropology from the University of Pennsylvania (1985). Before coming to Harvard, Prof. Rudner was a visiting scholar at the London School of Economics and was conducting research at the India Office Library on the social organization of commerce in South India from 1650 to 1850. The research was supported by a grant from the Social Science Research Council. His recent publications include "Religious Gifting and Inland Commerce in Seventeenth Century South India" (Journal of Asian Studies, 1987) and

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Meadow continued

... conducted site surveys in New Mexico and the Sultanate of Oman.

Prior to becoming Director of the Zooarchaeology Laboratory (1981), Dr. Meadow served as Asst. Head Tutor, Acting Head Tutor, and Teaching Fellow in the Dept. of Anthropology. He was Asst. to the Director, Center for Materials Research in Archaeology and Ethnology, M.I.T. in 1978-9.

Dr. Meadow's current research concerns the domestication and exploitation of animals in pre- and protohistoric periods on the eastern archaeological context on the inconcerns the domestication and exploitation of animals in pre- and protohistoric periods on the eastern margins of the Middle East, with an emphasis on cattle and equids. He is doing analysis of faunal remains from sites in the Middle East and North America with particular emphasis on the effects of archaeological context on the interpretation of faunal assemblages, the use of computers in the documentation of faunal remains, and the possibilities and limitations of faunal data for providing information on palaeoeconomies.

Dr. Meadow is the author of numerous articles which have appeared in academic journals. Among his recent publications are Equids in the Ancient World, 1 (ed. with H.-P. Uerpmann), Beihefte zum Tubinger Atlas des Vorderen Orients, Reihe, A, Nr. 19/1, 1986; and "Faunal exploitation patterns in eastern Iran and Baluchistan: a review of recent investigations," in Professor Giuseppe Tucci Memorial Volume, G. Gnoli, ed., IsMEO, Rome, 1987.

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Visiting Scholars

Dr. Gillian R. Bentley is a Visiting Scholar in the Dept. of Anthropology and a Lecturer on Anthropology at Brandeis Univ. She earned her undergraduate degree at the London Institute of Archaeology, Univ. of London, and the PhD in Anthropology at the Univ. of Chicago. Dr. Bentley is interested in ecological effects on human reproduction and, in particular, how energy output affects female fertility. Her background in Near Eastern archaeology led to an examination of demographic archaeology and how various kinds of analyses can help interpret population changes through time. These interests gradually gained a more biological perspective which culminated in a research paper about the !Kung San hunter-gatherers in the Northern Kalahari. Using a model drawn from modern athletic women and sports medicine, she suggested that the low fertility documented for !Kung women was, in part, explicable by the effects of the daily, strenuous energy expenditure necessitated in their gathering routine.

While at Harvard Dr. Bentley will work in Prof. Peter Ellison’s Endocrinology Laboratory. Prof. Ellison has been conducting a program among the Efe (pygmy hunter-gatherers) and Lese (horticultural villagers) of Zaire, part of the long-term Harvard Ituri Project. His work with these low-fertility populations, using radioimmunoassay of salivary steroids, has demonstrated endocrinological constraints on female fecundity that, like the !Kung, could partly be linked to energy output. Dr. Bentley will spend this year learning the techniques of radioimmunoassay and strengthening her background in both biological anthropology and endocrinology. During the spring semester she will collect and analyze data from a sample of Boston women engaged in high impact aerobic exercise in order to test the effects of this form of exercise on ovarian function.

Janet M. Chernela, Assistant Prof. of Sociology/Anthropology at Florida International Univ., Miami, is a Fellow of Cultural Survival, Inc. and a Visiting Scholar in the Dept. of Anthropology. Dr. Chernela received the PhD from Columbia Univ. (1983). Her dissertation was based on research conducted among the Tukanoan-speaking populations of the Northwest Amazon in Brazil.

Dr. Chernela was Asst. Curator of South American Ethnology at the American Museum of Natural History, New York (1971-75) and in 1980 joined the Ecology Dept. of the Instituto Nacional de Pesquisas da Amazonia in Brazil to coordinate and advise biological studies in indigenous areas.

Dr. Chernela has published in Portuguese and English, on ecological anthropology (fishing practices, manioc cultivation and forest farming), social anthropology, medical anthropology, mythology and gender. Forthcoming publications include: "Righting History in the Northwest Amazon," in Rethinking Myth and History, Jonathon Hill (ed.), Univ. of Illinois Press; "Some Considerations of Myth and Gender," in Dialectics and Gender, R. Randolph and D. Schneider (eds.), Westview Press; "Comparison of Parasite Burdens in Two Native Amazonian Populations" (with Vernon Thatcher), Medical Anthropology; "Managing Rivers of Hunger: The Importance of the Blackwater River Margin," Economic Botany; "Environmental Restoration in Southwestern..."
Dr. Patricia Anawalt, Consulting Curator of Costume and Textiles at the Museum of Cultural History, UCLA, gave a lecture on “The Emperors' Clothes: Aztec Pomp and Toltec Circumstances” at a lecture co-sponsored by the Peabody Museum and the Boston Society of the Archaeological Institute of America.


Dr. James Spudich, Stanford Univ. Medical School, gave a lecture on “Molecular Approach to Cell Motility.” Prof. Ernest Gellner, Cambridge Univ. spoke on “Soviet Anthropology.”

Prof. Peter S. Wells, Director of the Center for Ancient Studies at the Univ. of Minnesota gave a lecture entitled “First Cities of Europe: Industry and Trade”, sponsored by the Peabody Museum, A.I.A., Boston Society, and Earthwatch.

Dr. Jean-Francois Jarrige, Director of the Musee Guimet, Paris, and Director, French Archaeological Mission in Pakistan, lectured on “The Rise and Fall of the Indus Valley Civilization: The View from the Kachi Plain, Baluchistan, Pakistan.”

Dr. Vishakha N. Desai, Asst. Curator in charge of Indian, Southeast Asian and Islamic Collections at the Museum of Fine Arts, Boston, gave a lecture on “Golden Pagodas and Emerald Temples.”

Dr. Michael Jansen, Director of the Mohenjo-daro Research Project at Rheinish-Westfalischen Technischen Hochschule, Aachen, Germany, lectured on “New Light on the First Cities of South Asia: Architectural and Archaeological Documentation of Mohenjo-daro, Pakistan (2300-2000 B.C.).”

Prof. David K. Jordan, Univ. of California, San Diego, gave a lecture entitled “Chinese Ethnosyncrticism (Whatever That Means).”

**HALLAM LEONARD MOVIES, JR.**

1907 - 1987

Hallam L. Movius, Jr., Professor of Anthropology Emeritus at Harvard and Curator of Paleoanthropological Archaeology at the Peabody Museum died on May 30th. He was born in Newton, Massachusetts and prepared at the Berkshire School. He received his undergraduate and graduate education at Harvard (B.A. 1930, PhD 1937).

In the early years of his career, Prof. Movius excavated in Ireland and Southeast Asia. His research in Burma, Malaya and Java resulted in the publication of a monograph entitled *The Lower Paleolithic Cultures of Southern and Eastern Asia*.

During World War II, Prof. Movius served with the Air Force as a reconnaissance specialist in North Africa and Italy and was awarded the Legion of Merit.

In 1953 Prof. Movius began excavations at a Stone Age rock shelter at the Abri Pataud in Les Eyzies de Tayac, France. Over the next decade he trained many students and provided the archaeological world with a comprehensive understanding of this important Paleolithic site. *Excavations of the Abri Pataud*, a series of monographs published by the Peabody Museum, presents the results of this major project.

Prof. Movius received a number of honors and awards throughout his distinguished career. He was awarded the Viking Fund Medal by the Wennergren Foundation, and in 1970, the government of France named him Chevalier de l’Academie des Arts et des Sciences. A museum in Les Eyzies, housing artifacts from the Abri Pataud excavation and research documents of the participants in the project will be named in his honor.

Prof. Movius was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the Society of Antiquaries, the American Anthropological Association, and the Prehistoric Society of England.

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Museum curators and staff

**Dr. Monni Adams**, Assoc. in African and Oceanic Ethnology at the Peabody Museum, gave a lecture on "Indonesian Textiles: Layers of History and Culture" at the Rhode Island School of Design in Sept. A lecture at the Albuquerque Museum in Oct. was titled "Divine Gifts: Jewelry and Textiles of Indonesia." Two papers presented at the African Studies Annual Meeting in Denver in Nov. were: "Art as a Gender Strategy among the We (Guere) of Cote d'Ivoire, West Africa" and "Irregularity as a Pattern in Middle African Textiles." Recent and forthcoming publications by Dr. Adams include: "Problemes d'Identite Among the We, Cote d'Ivoire", *Arts d'Afrique Noire* 62; "Looking Beyond the Photographic Image", *Visual Images*, Vol 4; "Double Perspectives: Masking Among the We, Cote d'Ivoire", *Art Journal* (in press); "Eighteenth Century Kuba King Figures", *African Arts* (in press).

**Dr. Ian W. Brown**, Lecturer on Anthropology and Curator for the Hall of the North American Indian Exhibition gave a paper entitled "Some Thoughts on the Shrimping Hypothesis" at the Southeastern Archaeological Conference held in Charleston, S.C. in Nov. He is the editor of *Excavations at Morgan, a Coles Creek Complex in Coastal Louisiana*, by Richard S. Fuller and Diane Silvia Fuller, Lower Mississippi Survey Bulletin No. 11. Dr. Brown is currently doing research on 17th-18th century New England gravestone mortuary art and its reflection of family relationships and other social phenomena.

**Dr. Clemency C. Coggins**, Research Associate in the Peabody Museum gave a paper on "Classic Maya Metaphors of Death and Birth" at a conference on Elite Interaction among the Classic Maya sponsored by the School of American Research in Santa Fe. "Pure Language and Lapidary Prose" was the title of a paper given for the Univ. of Pennsylvania Centennial program on New Theories on the Ancient Maya. "Reflections on Teotihuacan" was the title of a paper given at the Society for American Archaeology meetings in New Orleans in April, 1987. A paper given at the S.A.A. meetings in Toronto in May, 1987 was entitled "Teotihuacan, Quetzalcoat, and the Maya." At the annual meetings of the A.A.A., Dr. Coggins delivered a paper on "Quetzalcoat and the Classic Maya" at a session on the feathered serpent. She gave a paper on "Tikal and Seibal and the Birth of the Baktun" at a conference on Vision and Revision in Maya Archaeology at the Univ. of New Mexico, Albuquerque. Dr. Coggins is the editor and a contributing author of *Artifacts from the Cenote of Sacrifice, Chichen Itza, Yucatan: Textiles, Basketry, Stone, Bone, Shell, Ceramics, Wood, Copal, Rubber, and other Organic Materials*, Peabody Museum Memoir Vol. X:3.

**Genevieve Fisher**, Assistant Registrar in the Peabody Museum, presented the Peabody Museum's loan and accession policies and procedures in a paper on "The Registrar's Role in History and Science Museums" at the annual meeting of the New England Museum Assoc. held in Boston in Oct.

**Dr. Michael N. Geselowitz** (PhD 1987), Curatorial Assistant in the Collections Department, was co-organizer and chaired a symposium at the annual meeting of the Society for American Archaeology in Toronto, on "Demography, Production and Exchange in the Evolution of Complex Social Organization in Late Prehistoric Europe." He delivered a paper on "The Development of Ironworking Technology and the Rise of Social Complexity in Iron Age Central Europe." He authored (with J. Habicht-Mauhe and J.W. Hoopes) another paper given at the SAA meetings entitled "Where's the Chief? The Archaeology of the Complex Tribe." A volume based on the symposium is currently being edited by Dr. Geselowitz and D. Blair Gibson (UCLA). The volume, titled *Tribe and Polity in Late Prehistoric Europe: Demography, Production and Exchange in the Evolution of Complex Social Systems*, will be published this year by Plenum Press, New York. "The Role of Iron Production in the Formation of an 'Iron Age Economy' in Central Europe" will be published in *Research in Economic Anthropology*, Vol. 10, B.L. Isaac, editor. Dr. Geselowitz gave a lecture on "Brains over Bronze?: Research into the central European Iron Age" to the W. Elmer Ekblaw Chapter of the Mass. Archaeological Society in Worcester.

**Dr. Rosemary Joyce**, Asst. Director of the Peabody Museum and Lecturer on Anthropology undertook analysis of ceramics excavated at El Remolino site, Chamelecon River, Honduras in June. The work which included re-excavation of the site is part of an ongoing project on this area. Dr. Joyce defined a new ceramic complex for the Protoclassic time period (ca. 200 A.D.) with Lowland Maya polychrom ceramic results of trade. Recent publications include: "Resultados Preliminares de las Investigaciones en Cerro Palenque," *Yaxkin* VIII (1 and 2): 175-190, Tegucigalpa, Honduras; The Terminal Classic Ceramics of Cerro Palenque, Honduras" in *Maya Ceramics*, BAR International Series 345 (i); "Intraregional ceramic variation and social class," in *Interaction on the Southeast Mesoamerican Frontier*, BAR International Series 327. She was an invited lecturer at the Texas Symposium on Olmec, Izapa and Maya Archaeology and Iconography held in March. The title of her lecture was "The Burials of La Venta: A Re-analysis."  

**Dr. Robert Maddin**, Center for Archaeological Research and Development, attended the International Symposium on Archaeometallurgy in Heidelberg in October. He gave an invited lecture on "Metals from the Ulu Burun Shipwreck." Forthcoming publications include: "Copper and tin from the Ulu Burun Shipwreck", *Der Anschnitt*, Spring 1988; "The Beginning of the Use of Metals and Alloys" in a volume based on a conference on metallurgy held in Zhengzhou, China in 1986, MIT Press, Spring 1988; and Techniques of the early blacksmith"  

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Richard Renshaw-Beauchamp has been appointed Head Conservator of the Peabody Museum. He comes to the Peabody from the British Columbia Provincial Museum in Victoria where he was Chief Conservator. A specialist in anthropological and natural history conservation, Mr. Renshaw-Beauchamp was trained in Fine Arts Conservation and Restoration in London and studied at the Instituto Central de Conservacion y Restauracion in Madrid. Prior to joining the staff of the British Columbia Provincial Museum, Mr. Renshaw-Beauchamp was Curator at the Fathers of Confederation Art Gallery and Museum in Charlottetown, Prince Edward Island, served as Chief Conservator in the Conservation and Interpretation Division of the National Historic Sites Service in Ottawa, and was the Acting Regional Director (Pacific Region) at the Canadian Conservation Institute in Vancouver. He was named Deputy Chief Conservator at the British Columbia Provincial Museum in 1973 and Chief Conservator in 1977.

Mr. Renshaw-Beauchamp is an expert in treating ethnographic, archaeological and historic artifacts. He set up two Federal conservation labs in Canada which became nationally respected facilities. His leadership at the B.C. Provincial Museum has seen that laboratory become second to none in Canada in conservation practice, materials and ethics. The laboratory enjoys a worldwide reputation. Through the International Council of Museums (UNESCO) Mr. Renshaw-Beauchamp is setting up, with Susan Walston of the Australian Museum in Sydney, a worldwide ethnographic conservation network and newsletter.


Mr. Renshaw-Beauchamp is married to Jane Hutchins, Chief Conservator in the Textile Conservation Center at the Museum of American Textile History in North Andover, Mass. Ms. Hutchins has been appointed Conservator of Textiles at the Museum of Fine Arts, Boston and will assume that position in March of this year.

The Peabody Museum has been awarded a grant of $700,000 by the National Endowment for the Humanities. The grant will facilitate installation of a permanent gallery: The Hall of the North American Indian. It is the largest grant the Peabody has ever obtained from the federal government for the implementation of one of its programs. Planning for this permanent gallery, directed by Curator Dr. Ian Brown has been under way for over a year. More than 500 objects have been selected for exhibition in the Peabody's largest gallery (over 6,000 square feet). The theme for the exhibit is "The Old and the New: Change and Continuity in Native American Lifeways." Dr. Brown expands upon this theme: "The purpose of this exhibition is to explore ways in which North American Indian and Eskimo groups reacted to western contact. A common failure of many anthropological exhibits is the tendency to show a static picture of Native American lifeways. Depicting Iroquois in longhouses, Navajos in hogans, and Tlingit in massive plank structures certainly does give an image of the variety of adaptations, but it tells us little about the complex story of how Native Americans came to be who they are today. Using a diachronic approach, this exhibition considers some of the changes in Native American lifeways from late prehistoric times to the contemporary scene."

The exhibit is scheduled to open in the Fall of 1989. The next year and a half will see a major renovation of the gallery, introducing modern temperature, humidity and security systems and the installation of newly fabricated exhibit cases. The undertaking represents the largest single effort ever undertaken at the museum for the exhibition of one of this nation's foremost collections of the Native American peoples.
The Falkland Islands Expeditions: Resurrecting the Last Yankee Clipper Ship (1982-1987)

ELEFHERIOS YALOURIS

Eleftherios (Fred) Yalouris is an Associate in Historical Archaeology at the Peabody Museum, and Director of Continuing Education at the University of Lowell. He was raised in South Portland, Maine, and educated at Harvard (A.B. in Classics and Archaeology, 1971) and Oxford (D. Phil. in Classical Archaeology, 1976). His dissertation was on “The Archaeology and Early History of Chios,” and he has published several articles on the topography of this island.

Since 1969 Dr. Yalouris has been involved in the field of nautical archaeology and has been on a number of underwater projects in Cyprus, Greece, South America, and New England. Since 1982, he has been Director of the Snow Squall Project in the Falkland Islands and Maine, and has published a number of articles on 19th century sailing ships.

The Peabody Museum is the sponsoring institution of the Snow Squall Project.

I. Introduction

The Snow Squall was a small extreme clipper ship (registered tonnage: 742) built in South Portland (then Cape Elizabeth), Maine by the shipwright Cornelius Butler, financed by his brother Alford, a successful Portland haberdasher. The vessel was launched on July 14, 1851 (three months after the launching of Donald McKay's fabulous Flying Cloud), in what was probably the most exciting year ever in American shipbuilding. The American clipper ship, described by historian A.B.C. Whipple as “the ultimate evolution of the sailing ship,” was at the peak of a design and construction frenzy that began in the East River yards of New York City in the mid-1840s. Spurred by the California Gold Rush and the heated competition with the British in the China tea trade, there was a flurry of competitive activity in designing and building faster, bigger, more boldly sailed cargo vessels. Although scholars disagree on a precise definition, a clipper ship can be briefly described as a square rigged cargo vessel, designed for speed and able to carry an unusual amount of sail, usually with a relatively narrow beam, and having a sharp, concave bow. Most American clippers were built in the decade between 1846 and 1856. So great was the backlog of orders in 1851 for new ships in New York that merchants were looking all over the east coast for shipyards to build their vessels. New England benefitted greatly from this demand, and even the smallest yards on the coast of Maine found opportunities to cash in on the boom. This was the situation that drew the Butler brothers into the competition.

In the latter part of the previous year, the Butlers had launched the Black Squall, a fine little clipper bark of about 400 tons which was quickly sold to Capt. John Codman of Boston and immediately went into the California trade. They used their profits to finance the construction of the Snow Squall, and indeed shortly after its launching, commissioned the building of another small clipper, the Warner (466 tons), which was sold to another New York merchant, William H. Merritt. All three vessels were distinguished by fine lines and very fast passages to South America, California, and the Far East. Thus ended the brief but profitable two year shipbuilding venture of the Butler brothers. No other vessel is known to have been built by Cornelius Butler.

The Snow Squall was one of a very small number of true clippers built in the Portland area. Her original survey recorded her basic dimensions as length: 157 feet, breadth: 32 feet, and depth of hold: 16 feet. A local newspaper, theAdvertiser (August 15, 1851), noted that she was “very sharp at the bows, with a lean but handsomely graduated run; but from her great breadth of beam and fullness of bulge, would be enabled to carry well, while at the same time she cannot fail of being a fast sailor. Her cabin is furnished with polished mahogany, rose and satin wood, with coving and caps and bases to the pilasters of burnished guild.” Her spars were very long and her masts of great height, characteristic of the clippers of the period. Her main yard was 65 feet in length, her main mast rose 142 feet above the main deck, and she was the first ship built in the area to carry standing skysail poles and yards. The Advertiser went on to say, “She is entirely painted white with the exception of a vermilion streak along her gunwales; and when at sea under full sail, must remind one of a snow cloud, if not a snow squall!”

She sailed out of Portland for New York in late August under the command of Capt. Silas D. Gregg, with the hope of being sold there, which she was, on November 28, for $30,410 to Charles R. Green, a little known New York merchant, who owned the vessel for all of her
thirteen working years. Green promptly sent the ship off to China under the command of Capt. Ira Bursley. She first went via Cape Horn to Honolulu, then on to Shanghai, and finally home to New York in an excellent run of 97 days: a highly successful maiden voyage and the start of a brilliant career.

Thirteen years was a better than average working life for an American clipper, for they were sailed hard, through fierce seas, and shortcuts were often taken in maintenance and repairs. The majority were shipwrecked or lost at sea (such as Warner), and most of the rest were worked mercilessly until their condition had deteriorated too much to be worth repairing, and then abandoned. During her career, the Snow Squall managed nine voyages from New York to the Far East and one to Rio de Janeiro and back in the coffee trade. It was on this voyage (1856) that she set her long standing record of 28 days from New York to Rio. In the spring of 1859, she beat one of Donald McKay's giant clippers, the Romance of the Seas, in a fast passage (92 days) from Shanghai to New York. In a later trip (1863), she was returning home from Penang by way of the Cape of Good Hope, when she was accosted by the Tuscaloosa, a Confederate commerce raider. Her crafty captain, James Dillingham of Massachusetts, noticed the gunports as the raider approached, and managed to pull his ship out of the range of the cannon fire. The Tuscaloosa gave chase for most of the day, but steadily lost ground and eventually gave up.

In February of 1864 the ship was on the way from New York to San Francisco when she encountered a fierce gale while passing through the straits of Le Maire near Cape Horn. She went onto some rocks, suffered damage to her rudder and keel, and was leaking very badly. Capt. Dillingham decided to turn around and race back to the Falkland Islands with the wind behind him. On March 2nd he brought his damaged vessel into Port Stanley, well-known as a haven for distressed ships coming out of the Cape Horn area. Dillingham tried for over three months to get his ship repaired; but finally was forced to sell it for salvage to the Falkland Islands Company, the local wool exporters. The Snow Squall was quickly stripped of masts, rigging, and deck gear and was hauled in towards shore, grounded securely, and used for many years hence as a bunker for storing coal and as a ready source of high quality lumber. A jetty was built out to the hulk, and ships coming from England would pull up alongside the hulk and load on the wool cargo. This became a common practice, and many old sailing ship hulks still lie in the harbor, having been used in jetties or for storage purposes (Fig. 1).

By the end of the last century, the Snow Squall had ceased to function as a storage facility, and as the size of the Falkland Islands Company jetty grew, more hulks were packed in alongside the clipper, and parts of the hull were covered over or cut away. She sat in about 12-15 feet of water, her once proud bow protruding ignominiously from the jetty (Fig. 2). Indeed, the best Continued on next page
preserved portion was the forward c.50 feet of the bow, fortunately the most architecturally important area of the hull. This was where the expeditions focused the most attention, although a comprehensive survey of the whole wreck was attempted.

What is important about the Snow Squall is that it is the only surviving example of a ship's navigational design that is available in the world. Precious little is known about how these vessels were built, for their Yankee builders kept their construction secrets very much to themselves. She is the last of this most elite breed of sailing ship, and as no known working plans of any American clipper exist, the Snow Squall represents our last opportunity to study closely this extremely important hull design. Because of this, it was decided to go to the Falkland Islands to see what of this vessel could be brought up and studied.

II. 1982 (1-19 March)

In March of 1982, the author went to the Falkland Islands with Nicholas Dean, a maritime author and photographer who had been to the Falklands in 1979 and had considered the possibility of bringing a piece of the Snow Squall back to Maine. Our goal was to examine, measure, and photograph extensively the wreck, and to determine the viability of a project to study and excavate the site; and to see if anything could be done to preserve (and possibly retrieve) a portion of this important archaeological artifact. Measurements were taken of all the more easily accessible timbers, and an underwater survey showed the hull to be in almost perfect condition from the low water mark down. On the inside of the hull there was 6-8 feet of built up overburden made up of harbor silt, coal, ship's timbers and gear, and a considerable amount of miscellaneous trash, for the hold of the vessel had been used as a rubbish dump for many years. Overall, about 80% of the hull remained, some of it inaccessible due to the position of the jetty (Fig. 2).

The survey took about two weeks, and the conclusions were that there were indeed the makings of a viable project, and also that the Snow Squall was deteriorating rapidly above the water line, and that part of it was likely to fall apart in the next few years. We were thus in danger of losing a valuable part of American design history. It was decided that a determined effort must be made to study her remains. Two weeks after we left Stanley, the Argentine troops invaded the Falkland Islands, on April 2, 1982.

III. 1983 (28 January - 12 March)

The war in the Falklands focused much attention on this obscure archipelago, and it was both a boon and a setback for the Snow Squall, which was substantially damaged during the conflict. This fact was vaguely known to us as we planned the second expedition. Our team of six included three nautical archaeologists, an engineer, a master carpenter, and a photographer. Four of the team were divers. Our goals were to examine, measure, and photograph the hull in great detail, as well as to remove or secure loose or exceptionally fragile timbers. Since the invasion, there had been no commercial transport to the Falklands, and after sixteen days of travel in a variety of British military aircraft and a troopship from Ascencion Island, we arrived in Stanley, greatly saddened to see that the ship's starboard bow had been smashed into by an oil barge that got out of control in a fierce storm. Part of the stem was torn out (and later recovered) and several timbers had come off. We found pieces of the hull scattered along the shore east of the jetty. We also managed to recover some major timbers sunk near the wreck site, so less was lost than initially appeared to be. We knew from the very first day that our main goal of measuring and documenting the wreck would not suffice, and we would have to take apart a major portion of the starboard bow or face severe deterioration (if not collapse) of that part of the hull in a short time.

The documenting process took the better part of two weeks. We began by laying a baseline along the approximate line of the keel, with three fixed points along it which were used in triangulating points for the site plan. Then we numbered and tagged major timbers (frames, strakes, beams, etc.) with labels made of Tyvek. The tags served as references in the detailed recording of dimensions of individual timbers. Hundreds of measurements were taken, and we were able to draw an accurate and useful site plan. This detailed examination of the hull led us to develop a certain intimacy with it, noting such details as adze and saw markings, shipwrights' scorings, and other indications of the Yankee craftsmen that built her. Outside the hull on the starboard side we tagged and measured all the outer hull planks, noting their graceful taper and curve as they approached the stem. A great number of detailed photographs enabled us to prepare a large photomosaic of the starboard side west of the dock. This was very helpful in studying the construction and planning the disassembly of the 19 foot section which was in danger of collapsing.

Even before we finished all the measuring, the planning had begun for the disassembly of the starboard bow section, the most crucial phase of the operation. As we had no funds specifically for this, we had to rely on our ingenuity and the generosity of the military establishment and the Falkland Islands Company. We decided that we would make our longitudinal cut just aft of the twelfth frame from the stem, a weak point in the ship's construction and the region where several timbers had been fractured by the violent blow from the oil barge. Horizontally, most of our work had already been done by the action of the sea over the past 120 years. The sea had broken through the hull in the intertidal zone (Zone 2, between the high and low tide lines), and as the stem had been broken off earlier, there were very few truly sound timbers to hold up the structure. We began by removing each outer hull plank one at a time, cutting it off at the twelfth frame and being careful to keep as many as possible of the trunnels (wooden nails) intact. Then followed the futtocks, the individual timbers that are pieced together to make up the ship's frames. Most of them came off easily, others required the assistance of a come-along, and two of them (4a and 7b) were so stubborn that we
decided to leave them in place, still attached to the ceiling (interior) planking and waterway timbers. Interestingly, these two timbers were made of hard southern yellow pine. All the other frames were made of white oak and had weakened and rotted considerably. The ceiling planking and waterway timbers were now exposed from the outboard side (Fig. 3) and we proceeded to cut through them just aft of the twelfth frame. At the same time we cut ¾ of the way through the two forwardmost ‘tween deck beams (A & B) that were attached to this section. It was a slow, painful, and frustrating process, as we had to use handsaws, and the more we cut, the greater was the danger of the whole section collapsing.

It was decided to remove the remainder of the 19 foot section in two large units: the main breast hook (and intricate A-shaped piece composed of several large timbers and weighing about 1000 lbs), and what remained of the starboard section (including the main waterway timbers, the stubs of two ‘tween deck beams, the two pointers (diagonal support timbers running from under the beams to the keelson) and accompanying lodging knees, and five wide strakes of ceiling planking. This large section was about 19 feet long, 6 feet high, 5 feet deep, and weighed close to two tons. As there was no available crane long enough to reach out to it, we decided to float it away at a very high tide. Thus we planned for the final cutting to take place on the morning of March 2nd, when there was a full moon and the highest tide of the month. On the day before, we lashed four 50-gallon drums underneath the waterways for added buoyancy, and then we removed the breast hook and floated it over to where the crane would be the next day, ready for lifting. We made further cuts at all the critical points, but left enough intact so that the section would survive one more low tide before the next morning. Fortunately it was a calm night, as a Cape Horn gale (so common in the Falklands) could have destroyed our work. The next day found us down at the site at 6:00 a.m., working furiously to finish the final cuts, checking lashing, and making last minute preparations for separating the 19 foot section from the rest of the hull. Our most difficult cut was the forward pointer, which was already under water. This cut was made using a chain saw blade with two long ropes at each end, enabling two men working in tandem to make the cut from a dock and a barge 30 feet away. At 8:30 a.m. a military crane and a flatbed truck arrived at the quay side close to the wreck and began lifting the breast hook and the recovered section of the stem out of the water. Shortly after, at precisely high tide, the starboard bow section was severed from the main structure and carefully floated over to the waiting crane. The large pieces were then brought over to a nearby 20 foot steel container and loaded in with great care. The operation was a complete success and was finished in less than two hours.

What remained to be done was the careful packing of the container, the cleaning up of the area around the wreck, consolidating the remains of the hull to reduce the possibility of further damage, and making the arrangements for shipping the container to England. Fortunately it was a calm night, as a Cape Horn gale (so common in the Falklands) could have destroyed our work. The next day found us down at the site at 6:00 a.m., working furiously to finish the final cuts, checking lashing, and making last minute preparations for separating the 19 foot section from the rest of the hull. Our most difficult cut was the forward pointer, which was already under water. This cut was made using a chain saw blade with two long ropes at each end, enabling two men working in tandem to make the cut from a dock and a barge 30 feet away. At 8:30 a.m. a military crane and a flatbed truck arrived at the quay side close to the wreck and began lifting the breast hook and the recovered section of the stem out of the water. Shortly after, at precisely high tide, the starboard bow section was severed from the main structure and carefully floated over to the waiting crane. The large pieces were then brought over to a nearby 20 foot steel container and loaded in with great care. The operation was a complete success and was finished in less than two hours.

What remained to be done was the careful packing of the container, the cleaning up of the area around the wreck, consolidating the remains of the hull to reduce the possibility of further damage, and making the arrangements for shipping the container to England. Now that the most fragile section of the hull had been removed, it was easy to shore up the wreck using scrap lumber found around the dock area and to leave it so that it would remain more or less stable for the next two or three years. The severed waterway section, breast hook, and forty or so individual timbers were painstakingly packed with supports and buffers. A number of waterlogged fragments from the intertidal zone were placed in a specially built cradle and lowered back into the wreck so that they would remain wet and available for possible conservation treatment in the future. Fortunately, the timbers we were shipping back were all from Zone 3 (above the high tide line), and did not require immediate conservation attention. As our borrowed container was due to be shipped back to the United Kingdom, we were most fortunate in getting free transportation for our cargo to Felixstowe, England and then across the Atlantic to Boston, arriving on June 8. From there it was shipped via truck to Maine, and after 132 years a piece of the only surviving American clipper ship had come back to the town where it was built.

The timbers were brought to the campus of the Southern Maine Vocational Technical Institute in South Portland, where a building was graciously provided for storing, cleaning and conserving the pieces. We immediately began putting together a conservation laboratory for the treatment of the wood, different types of metals, and a variety of artifacts. The laboratory

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has grown considerably since 1983, thanks to a lot of donated equipment and supplies, and an enormous amount of volunteer labor.

IV. 1984 (28 May - 18 June)

The third expedition team consisted of David Switzer, nautical archaeologist, and Bruce Lane, engineer. The goals were to take further measurements (especially offset measurements which would enable us to plot the curve of the hull), collect more wood and metal samples from under water for further testing, and work out a number of engineering problems (including testing some dredging equipment involved in excavating and bringing up the rest of the clipper bow. Once again, our carefully laid plans had to change, for more damage to the hull was discovered on arrival in Stanley. A series of strong gales back in February had battered what remained of the above water part of the starboard bow and actually blew over this 36 by 8 foot section which weighed about 8 tons. It was obvious that the first priority would be to retrieve this structure, which was floating in the water between the Snow Squall and the hulk of the William Shand, a British bark of 1839. The section was held in place by two 12' square 'tween deck beams, and these first had to be cut with hand saws. After this, the whole section was floated over to a nearby slipway and rigged by a diver for lifting with a crane. As in 1983, The Royal Engineers assisted by providing a ten ton mobile crane, and on June 9, the huge section was finally brought out and secured at the top of the slipway. It then was supported by chocks and crib work to insure that its original longitudinal curve would be retained.

Although the time available to do the other planned tasks was greatly curtailed by the rescue effort, most of the work was completed. This included collecting and stowing a variety of loose timbers, testing a new water dredge design, examining the nature of the seabed below the surface silt, removing samples of submerged wood and metal sheathing for further testing, and trying out a new measuring system which permitted the triangulation of points along the outer surface of the hull. This involved attaching three stainless steel measuring lines to a pointer held by a diver in the water and extending them back to the jetty where the lines were attached to counterweights and ran along a linear scale where the measurements could be recorded (Fig. 4). A special computer program later translated these measurements into offsets, and then into water lines and body lines of the clipper. The results gave us our first clear picture of the shape of the hull under the murky water.

V. 1986 (5 January - 6 February)

The seven members of the 1986 expedition again travelled to the Falkland Islands from Brize Norton Royal Air Force Base in England, a 19 hour trip via Ascension Island.
A number of important objectives were established, including the cleaning and packing for shipment of the 36 foot starboard hull section that had been rescued and brought ashore in 1984, and the retrieval of structural items from under the jetty and from within and around the mud-embedded lower portion of the hull. These timbers also had to be cleaned, labelled, photographed, and in some cases treated with polyethelene glycol (PEG), a common preservative used in the treatment of waterlogged wood. A section of the port side which included the main deck bulwark had to be removed intact. This was the only remaining part of the vessel’s main deck structure, and thus very important for producing an accurate cross section plan of the hull. Additional offset measurements had to be taken in order to create accurate drawings showing the shape of the hull. In this task we used the counterweight measuring system developed in 1984. All of our objectives were achieved, though not without testing the stamina and ingenuity of each member of the expedition. The team worked very hard in difficult conditions. We had only one day off in the month that we were there.

Work on the bow section of Snow Squall began with the erection of the offset measuring stations and the removal of an unusually large accumulation of kelp and algae from the area of the bow. The large amount of vegetation appeared to be the result of a change in the wreck environment due to increased harbor pollution and the 1985 efforts of the FIC to reinforce the jetty through the placement of many tons of stone rip rap topped with concrete. Extending from the shore along the center of the jetty and through a c.30 foot section of Snow Squall’s middle, the large stone blocks have permanently eliminated access to that section of the hull. The rip rap also has halted the normal tidal flow, and that condition combined with the prevailing westerly wind situation caused our bow section to become a collecting area of wave and wind driving kelp as well as algae, whose growth is accelerated by residual pollution. As the accumulation of kelp threatened our measuring system, we had to spend many hours collecting it and dumping many dinghy loads of it down wind from the wreck site. (Fig. 5)

The work scene then shifted to excavation inside the hull and the collection of scattered timbers in and around the bow area. With the help of the FIC crane a considerable amount of debris and litter was extracted from the bow area of the hull just west of the jetty. By means of cargo slings, structural timbers necessary to the eventual reconstruction of the bow were lifted onto the jetty area above the wreck site for initial cleaning and conservation. These included a piece of the stem, stanchions, beams, ceiling strakes, and knees. While this was going on, a saw team worked under the jetty, cutting away by hand the port bulwark assemblage of the vessel. This was eventually lifted out intact.

Using a backhoe, a test trench was excavated in the center of the hull near the jetty. The purpose of the trench was to determine the penetrability of the hardpacked overburden of mud and debris and to provide initial access to the keelson. Each bucket load of black viscous mud was examined for artifacts. Some interesting bottles that post-dated Snow Squall were retrieved. No finds that could positively be associated with the clipper were noted, although some did appear in 1987 at the lowest levels. A metal probe permitted us to make contact with what was believed to be the keelson some six feet below the mud line. Lack of underwater visibility impeded verification.

Within a week the jetty area above the wreck site was covered with an assortment of interesting structures. All the timbers were carefully cleaned using various brushes, picks, scrapers, and a high pressure “steam jenny” borrowed from the nearby Plant and Transportation Authority garage. This proved to be an extremely efficient and effective tool for removing packed mud, algae, mussels, barnacles, and other unwanted matter. Once clean, the individual timbers were tagged with identification labels and photographed. Those that were particularly waterlogged were brushed with a preliminary coat of PEG. The treatment was repeated according to the needs of the individual timbers and our limited supply of the chemical. Later on, just before loading the container, all the timbers were sprayed with the fungicide Con San.

A 40 foot steel container (left

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behind by the Argentines after the war) was acquired for safely shipping the 36 foot piece, the 81 loose timbers, and various artifacts back to the United States. This was brought to the timber conservation area and a 38 ton crane and 40 foot flatbed were brought over to the slipway where the large hull section had been stored. The 8 ton section was transported and safely stowed inside the container (Fig. 6) thanks to the work of many hands and skillful crane handling. What remained to be done was the careful loading of individual timbers and artifacts and the final collection of offset measurements, which was greatly impeded by fierce wind conditions.

On January 28, the container was closed in Stanley, and on April 19, it arrived in South Portland, having been shipped via the same route as the previous container. The materials arrived in excellent condition and were quickly stored in the conservation laboratory at SMVTI. Several holding tanks had been constructed in advance and the most needy timbers were placed in them and covered with fresh water. Iron objects were placed in tanks with a 5% solution of sodium hydroxide to help arrest corrosion. In the months that followed, volunteers worked on cleaning, cataloguing, and treating the timbers and other artifacts under the supervision of conservator Betty Seifert.

VI. 1987 (20 December, 1986 - 12 February, 1987)

Planning for the final expedition began even before the 40 foot container arrived in Maine. It was to be by far the most complex and challenging of our efforts. Throughout the spring and summer, the technical aspects of the project were being worked out in detail, and a large assortment of expedition equipment was steadily accumulated. What had been left behind in Stanley was the below water portion of the bow, by far the most architecturally interesting and best preserved part of the vessel. The goal of the final expedition was to excavate, cut away, raise from the seabed, and transport intact the 35 foot lower part of the clipper bow. It was an awesome task, and there was much speculation as to the viability of the plan. The key to the safe lifting and transportation of this 40 ton artifact was a 12,000 lb. steel lifting frame which could be shipped to the Falklands in pieces along with our equipment in a 20 foot steel container, and then reassembled there. All the equipment, including diving gear, pumps, compressors, airbags, conservation supplies, and hundreds of tools, spare parts, and other items had to be assembled, catalogued, and tested before being packed in our container, which was trucked from South Portland on November 2, then shipped first to England and then to the Falklands, where it arrived after Christmas.

Our advance party of five (out of twelve) arrived in the Falklands on December 22 to prepare the site, lay out the equipment, and begin some of the preliminary work. The second group of three arrived just before the new year, and as the container came a week late, our work fell behind schedule, and we were forced to work 11-12 hours a day, seven days a week for most of the time we were there. There were three major goals for the crew of eight: excavate the inside of the hull and remove as much material as possible, cut under water through the ship’s sides, keel, and keelson with large two man saws, and tunnel under the hull in two locations to bring the lifting chains through.

At first the cutting went very smoothly, but as the cutters got to the thicker, more deeply imbedded timbers near the garboard strakes and keel, the saw blades were going through gravel, spikes, and other debris caught between the frames and under the hull. The saws were dulling after only a few strokes, and it was very difficult to keep them sharp long enough for the divers to make substantive progress. The hull clearance divers encountered many more artifacts than expected, and our efforts to extract them in a careful and responsible manner (even though the great majority of artifacts were not related to the ship), also slowed down that process. In addition, it appears that coal must have been stored in the hull at some point because a great deal of coal was removed and a fine, black, gritty silt had built up inside the hull which was very difficult to remove and made for zero visibility. It was like diving in black paint. The divers tunnelling under the hull encountered a thick, sticky, black mud that often clogged up the dredges and other equipment. The working conditions were miserable and often dangerous for the divers. The weather over the site was cold, damp, and blustery. It was there-
and with great enthusiasm. We found the crew working very hard from the closing of the expedition was at stake, our bow section to Maine. The success, especially the need for more manpower. There was still a lot more excavating to do and our divers were getting very tired. It was getting more and more difficult to get them to jump into that miserable water two or three times a day with not a single day off. Also our cutting progress had slowed down so much that we knew we could never make our rendezvous with the Danish freighter Asifi which was to carry our bow section to Maine. The success of the expedition was at stake, and as project director, I had the task of dealing with these problems. Because of the large military force on the islands, there were a number of divers there connected with the services. Once the word was put out among them, many professional and amateur divers began showing up at the site to offer help. It was an excellent opportunity to increase substantially our working time in the water.

Our second big problem was the need for an underwater chain saw, a rare and dangerous tool that we had originally expected to borrow from the Royal Navy Clearance Divers in the Falklands. But we discovered upon our arrival that just a few days before they had been dispatched to the remote island or South Georgia to rebuild the jetty there. We then called contacts in the U.S. and England to find a pneumatic chain saw and a skilled diver to operate it who could be on a military flight from the U.K. within 24 hours. A firm was located, and arrangements were thus made, and diver Tony Graham arrived in Stanley on February 1st. We had him in the water within an hour! He did two weeks’ work in two days. It was not known for certain that he had managed to cut completely through the hull at all points, but the 24 inch saw blade could not go any deeper, so all we could do at this point was wait for the next high tide and hope for the best. In the week before, chief diver Dick Swete and the diving team had finished tunnelling and running the lifting chains under the hull at two locations: forward about eight feet aft of the stem and aft about four feet forward of the cut line. The four giant lifting bags (each having a lift capacity of about 20,000 lbs.) were placed in the water and hooked up to the chains. There was some concern as to whether they were low enough in the water to provide sufficient buoyancy for the lift. With these two unknowns plaguing us, all we could do was try and see what happened. We had always planned to use the rising of the tide for the lift, and as a very high tide was expected at about 9 pm on February 2, we decided to give it a try then. The bags were inflated to their maximum load, and it was obvious that there was a tremendous strain on the hull as well as the bags. With the exception of a few creaks, groans, and pops, nothing happened. We were deeply disappointed.

On the next day the four lift bags were deflated and filled with water so that they would be easier to sink. After much hard work, divers succeeded in pulling each bag down about 2-3 feet lower on the chains. At the same time, Gary Carboneau worked furiously with the air lift to remove mud and reduce suction on the port side of the hull. Tony Graham resumed cutting on the interior of the hull, but was encountering many obstructions and had ruined five chain saw blades. He had one blade left. Raymond Liddell noted in the log book for that day: “A final challenge to the expedition’s character, perserverance, and good humor was made by whatever forces or spirits hold old wooden ships on the bottom of the ocean in their muddy, slimy embrace. Almost simultaneously, the rain began to beat down with fury, the chain saw seized up and refused to cut, the underwater communication system shorted out, and, with an eerie wail, the supply hose for the hooka breathing apparatus burst.” We were forced to suspend diving operations for the day while we set to repairing equipment. High tide was expected at about 11 am on the next day, and we decided that we would make our second try then.

On the morning of February 4th, we undertook our work with determination, knowing we had few chances left and still not knowing if the hull had been severed completely or if the bags would work. I did a final inspection dive of the hull, bags, and rigging; the bags were inflated, and we waited. A diver was sent down with the underwater communication gear to report on progress. At about 11:22 am we heard through the speaker system, “We have separation!” A multitude of cheers came from the team and the many onlookers who had gathered on the jetty for the occasion. The bow came up very slowly, in a quiet and stately manner: first the stem broke the surface, then the after portions. After years of groping blindly under water we would finally get a look at this structure. The copper alloy sheathing was of a shining golden hue, and we all marvelled at the sharp, concave lines of the bow.

The next day, a local tug came over to tow the bow section to deeper water, and after many stops and starts, it was towed out (Fig. 7) and moored on the east side of the jetty and left there for the night. On the following morning the bow was towed slowly for about two miles east to the other end of Stanley harbor to the military port facility for the lift on to the Asifi. In contrast to the weather we had for the past two months, it was a fine day with hardly any wind, perfect for the delicate work that was to come. A military mexi float was provided for our divers to use as a working platform. In the previous two weeks, a crew led by chief engineer Bruce Lane had been working long hours in harsh conditions assembling the lifting frame and suspending and lashing the heavy cod net in which the bow section would be cradled on the homeward passage. The Asifi was tied up at the pier with her port side out. The frame had been lifted on board several days before and was now picked up by the two giant cranes and gently lowered into the water to rest on the harbor floor. When the divers released the cables attached to the frame, the bow was floated over it and two large nylon lifting straps were passed under the hull to take up

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The bow section, held afloat by the giant lift bags, is towed to deeper water in Stanley Harbor, 1987.

The bow section, cradled in the net of the lifting frame, emerges from the water.

slack (using the ship's cranes) so that the chains and lift bags could be removed. When this was done, there followed about three hours of painstaking maneuvering as the hull was slowly lowered into the frame.

By mid-afternoon, everything was in place, and the signal was given to begin the lift. As the whole assembly broke the surface (Fig. 8), all seemed well until it got about a third of the way out of the water. At that point, the steel frame began to bend inwards at the top, and a number of bolts sheared, sounding like rifle fire. The cranes were stopped and the frame was lowered back into the water while several of us conferred. It was obvious that the bow section weighed more than we had calculated, and in addition to this it may have been carrying as much as 15-20 tons of mud and water as it came out. We did not want to risk five years of hard work, but if the lift was not completed, we might have been forced to abandon the whole project. The decision was up to the project director and for a few lonely moments several hundred pairs of eyes stared in silence. The frame was badly bent but still intact, and as the net itself was strong enough to carry 60 tons of fish, I gave the go ahead and slowly the bow rose again. The frame had bent as much as it was going to, and the cod net was not tearing, so the whole contraption held. There was a collective sigh of relief as the two cranes gently lowered the giant artifact onto the deck of the freighter.

On the next day, our tired crew worked to pack the carefully prepared loose timbers, hundreds of artifacts, and all our equipment into our container, and this too was loaded onto Asifi. When this material was later unpacked in Maine, we were very pleased to note no damage or deterioration whatsoever, even though the artifacts had gone through dramatic changes in temperature and humidity during the voyage. Our conservation team had worked diligently to clean and pack everything with care.

On the 9th of February, the Asifi headed out of Port Stanley for the 30 day voyage to Maine, with Nick Dean on board to look after our precious cargo. Each day he worked at cleaning out the inside of the hull, bagging any artifacts which might emerge, and adjusting the spraying system which kept the wood wet. When the ship reached Portland on the 11th of March, the bow was all cleaned out, and construction details we had never seen before could now be studied. Two major things caught our eyes when we were able to get a close look: first, the timbers (especially those of southern yellow pine) were in an excellent state of preservation; and second, that sleek, concave extreme clipper bow was every bit as beautiful and enchanting as we had imagined.

The last leg of the Snow Squall bow's 8,000 journey involved unloading the frame onto a barge, towing it across the harbor to Spring Point in South Portland, lift-
ing it on to a large flatbed, and moving it the final few hundred yards to its resting place at the Spring Point Museum. A temporary enclosure has been built around the frame joining it to the conservation laboratory. A 24-hour automatic sprinkler system was quickly installed to insure that the timbers stayed wet, and all the loose timbers and artifacts were brought into the laboratory to undergo further cleaning, documenting, and conservation. So far the ship’s timbers have shown little deterioration, although the copper alloy sheathing has undergone slight degradation due to some electrolysis. This sheathing will soon have to be removed and treated separately. Conservation work on the timbers and artifacts will probably continue for another 3-5 years. This is also the approximate length of time it will take to unlock most of the design and construction secrets of this Yankee clipper.

We have learned much and will learn much more from this project. In the fieldwork, we developed a number of field techniques relating to measuring, excavating, lifting, and transporting of old wooden vessels, as well as on-site conservation, many of which may be useful in other related projects. In the laboratory, there are a number of conservation and reconstruction challenges. Regarding the vessel itself, we look forward to explaining a number of construction puzzles and curious adaptations relating to the fashioning of the clipper bow. We also hope to show intelligible without some understanding of extra-local and supra-local connections. The further development of the anthropological study of law is one way to transform this misleading inside/outside duality into a single field of analysis. The study of Kilimanjaro is one step in that direction.

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Curators and staff, from page 12

to be published in proceedings of a symposium on metallurgy held in Prague in October, 1987. Dr. Maddin was elected an Honorary Member of the Japan Institute of Metals. His research continues on metals from the Ulu Burun shipwreck, the beginning of metal use in Sardinia, and analysis of metals from the joint Istanbul/Univ. of Chicago excavations at Cayonu Tepesi, Turkey.

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