

The Prehistory of Food

Appetites for change



Edited by Chris Gosden and Jon Hather

ROUTLEDGE

ONE
WORLD
ARCHAEOLOGY

32

**Also available as a printed book
see title verso for ISBN details**

THE PREHISTORY OF FOOD

The production and consumption of food can tell us much about how different cultures constructed and perceived their environment. The distinction between what is regarded as edible and inedible and the ecological systems in which people live are not just a passive backdrop to life but important indications of prevailing social and cultural systems. *The Prehistory of Food* discusses the changing uses of food in prehistory and sets subsistence firmly within its social context.

This collection presents studies from across the globe examining the interrelationships of food, biology and ecology. The contributors investigate the different roles food plays in culture: as an object of consumption and, subsequently, an important factor of socioeconomic change, as an agent of innovation affecting agriculture and methods of preparation and cooking, as a vital part of the landscape and as an important influence on the history of humans and plants. *The Prehistory of Food* contains case studies ranging from the rainforest groups of South America, to peoples of the desert fringes of Asia, to farmers in the Highlands of New Guinea. The book charts the movements of plants over the last 5,000 years, and with an impressive wealth of archaeological, genetic, botanical and linguistic evidence it tells the complex and fascinating story of the relationship between humans and their food.

The Prehistory of Food is of interest to all students and academics in the fields of archaeology, anthropology and archaeobotany.

Chris Gosden is Lecturer in Archaeology and curator at the Pitt Rivers Museum, University of Oxford. **Jon Hather** is Lecturer in Archaeology at the Institute of Archaeology, University College London.

ONE WORLD ARCHAEOLOGY

Series Editor: P.J.Ucko

Animals into Art
H.Morphy (ed.), vol. 7

Archaeological Approaches to Cultural Identity
S.J.Shennan (ed.), vol. 10

Archaeological Heritage Management in the Modern World
H.F.Cleere (ed.), vol. 9

The Archaeology and Anthropology of Landscape: shaping your landscape
P.J.Ucko & R.Layton (eds), vol. 30

Archaeology and Language I: theoretical and methodological orientations
R.Blench & M.Spriggs (eds), vol. 27

Archaeology and Language II: archaeological data and linguistic hypotheses
R.Blench & M.Spriggs (eds), vol. 29

Archaeology and the Information Age: a global perspective
P.Reilly & S.Rahtz (eds), vol. 21

The Archaeology of Africa: food, metals and towns
T.Shaw, P.Sinclair, B.Andah & A.Okpoko (eds), vol. 20

Centre and Periphery: comparative studies in archaeology
T.C.Champion (ed.), vol. 11

Conflict in the Archaeology of Living Traditions
R.Layton (ed), vol. 8

Domination and Resistance
D.Miller, M.J.Rowlands & C.Tilley (eds), vol.3

*Early Human Behaviour in Global Context: the rise and diversity of the Lower
Pælaeolithic Record*
M.Petraglia & R.Korisettar (eds), vol. 28

The Excluded Past: archaeology in education
P.Stone & R.MacKenzie (eds), vol. 17

Foraging and Farming: the evolution of plant exploitation
D.R.Harris & G.C.Hillman (eds), vol. 13

From the Baltic to the Black Sea: studies in medieval archaeology
D.Austin & L.Alcock (eds), vol. 18

Historical Archaeology: back from the edge
P.P.A.Funari, M.Hall & S.Jones (eds), vol. 31

Hunters of the Recent Past
L.B.Davis & B.O.K.Reeves (eds), vol. 15

The Meanings of Things: material culture and symbolic expression
I.Hodder (ed.), vol. 6

The Origins of Human Behaviour
R.A.Foley (ed.), vol. 19

The Politics of the Past
P.Gathercole & D.Lowenthal (eds), vol. 12

The Prehistory of Food: appetites for change
C.Gosden & J.Hather (eds), vol. 32

The Presented Past: heritage, museums and education
P.Stone & B.L.Molyneux (eds), vol. 25

Sacred Sites, Sacred Places
D.L.Carmichael, J.Hubert, B.Reeves & A.Schanche (eds), vol. 23

Signifying Animals: human meaning in the natural world

R.G.Willis (ed.), vol. 16

Social Construction of the Past: representation as power

G.C.Bond & A.Gilliam (eds), vol. 24

State and Society: the emergence and development of social hierarchy and political centralization

J.Gledhill, B.Bender & M.T.Larsen (eds), vol. 4

Time, Process and Structural Transformation in Archaeology

S.E.van der Leeuw & J.McGlade (eds), vol. 26

Tropical Archaeobotany: applications and developments

J.G.Hather (ed.), vol. 22

The Walking Larder: patterns of domestication, pastoralism, and predation

J.Clutton-Brock (ed.), vol. 2

What is an Animal?

T.Ingold (ed.), vol. 1

What's New? A closer look at the process of innovation

S.E. van der Leeuw & R. Torrence (eds), vol. 14

Who Needs the Past? Indigenous values and archaeology

R.Layton (ed.), vol. 5

THE PREHISTORY OF FOOD

Appetites for change

Edited by

Chris Gosden and Jon Hather



London and New York

First published 1999
by Routledge
11 New Fetter Lane, London EC4P 4EE
Simultaneously published in the USA and Canada
by Routledge
29 West 35th Street, New York, NY 10001

Routledge is an imprint of the Taylor & Francis Group
This edition published in the Taylor & Francis e-Library, 2005.

“To purchase your own copy of this or any of Taylor & Francis or
Routledge's collection of thousands of eBooks please go to
www.eBookstore.tandf.co.uk.”

© 1999 Selection and editorial matter, Chris Gosden and Jon Hather;
individual chapters, the contributors

All rights reserved. No part of this book may be reprinted or
reproduced or utilized in any form or by any electronic,
mechanical, or other means, now known or hereafter invented,
including photocopying and recording, or in any information
storage or retrieval system, without permission in writing from
the publishers.

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Gosden, Chris, 1955–

The prehistory of food: appetites for change/Chris Gosden and
Jon Hather.

p. cm.—(One world archaeology)

Includes bibliographical references and index.
(hardbound: alk. paper)

1. Prehistoric peoples—Food. 2. Food habits—History.

I. Hather, Jon G., 1963– . II. Title. III. Series.

GN799.F6G67 1999

306.4–dc21 98–20445

CIP

ISBN 0-203-20338-0 Master e-book ISBN

ISBN 0-203-27096-7 (Adobe e-Reader Format)
ISBN 0-415-11765-8 (Print Edition)

Contents

<i>List of figures</i>	x
<i>List of tables</i>	xiv
<i>List of contributors</i>	xv
<i>Preface</i>	xvii
<i>Introduction</i>	
Chris Gosden	1
Part I Food and culture	10
1 <i>Cash-crops before cash: organic consumables and trade</i>	
Andrew Sherratt	12
2 <i>Cultural implications of crop introductions in Andean prehistory</i>	
Christine A.Hastorf	33
3 <i>Uywaña, the house and its indoor landscape: oblique approaches to, and beyond, domestication</i>	
Alejandro F.Haber	57
4 <i>Of water and oil: exploitation of natural resources and social change in eastern Arabia</i>	
Soren Blau	81
5 <i>Plant exploitation among the Nukak hunter-gatherers of Amazonia: between ecology and ideology</i>	
Gustavo G.Politis	97
Part II Introductions	125
6 <i>Food processing technology: its role in inhibiting or promoting change in staple foods</i>	
Helen M.Leach	127
7 <i>Subsistence changes in India and Pakistan: the Neolithic and Chalcolithic from the point of view of plant use today</i>	
K.L.Mehra	137
8 <i>Megalithic monuments and the introduction of rice into Korea</i>	
Sarah Milledge Nelson	145
9 <i>The dispersal of domesticated plants into north-eastern Japan</i>	
Catherine D'Andrea	164
10 <i>Native Americans and animal husbandry in the North American colony of Spanish Florida</i>	

Elizabeth J.Reitz	182
Part III Food and the landscape	194
11 <i>The meaning of ditches: deconstructing the social landscapes of New Guinea, Kuk, Phase 4</i> Tim Bayliss-Smith and Jack Golson	196
12 <i>Different histories: a common inheritance for Papua New Guinea and Australia?</i> Chris Gosden and Lesley Head	227
13 <i>From the swamp to the terrace: intensification of horticultural practices in New Caledonia, from first settlement to European contact</i> Christophe Sand	246
14 <i>Warfare and intensive agriculture in Fiji</i> Robert Kuhlken	264
15 <i>Whose land is it anyway? An historical examination of land tenure and agriculture in northern Jordan</i> Carol Palmer	282
16 <i>Getting a life: stability and change in social and subsistence systems on the North-West Frontier, Pakistan, in later prehistory</i> Ken Thomas	300
17 <i>Interaction of maritime and agricultural adaptations in the Japan Sea basin</i> Yuri E.Vostretsov	315
18 <i>Invisible pastoralists: an inquiry into the origins of nomadic pastoralism in the West African Sahel</i> Kevin MacDonald	326
19 <i>Evidence for agricultural change in the Balikh basin, northern Syria</i> Willem van Zeist	342
Part IV Plants and people	367
20 <i>Tracking the banana: its significance in early agriculture</i> Edmond De Langhe and Pierre de Maret	369
21 <i>The puzzle of the late emergence of domesticated sorghum in the Nile valley</i> Randi Haaland	387
22 <i>The impact of maize on subsistence systems in South America: an example from the Jama river valley, coastal Ecuador</i> Deborah M.Pearsall	408
23 <i>Starch in sediments: a new approach to the study of subsistence and land use in Papua New Guinea</i> Michael Therin, Richard Fullagar and Robin Torrence	427
24 <i>Traditional seed cropping systems in the temperate Old World: models for antiquity</i> Ann Butler	452

25	<i>Agrarian change and the beginnings of cultivation in the Near East: evidence from wild progenitors, experimental cultivation and archaeobotanical data</i>	
	George Willcox	468
	<i>Index</i>	490

Figures

1.1	Chronological developments in the Fertile Crescent, 9000–2500 cal. BC	22
1.2	Agrarian regimes in the western Old World in the earlier Holocene	25
2.1	Central Andean region: twelve domestic plant taxa distributions, 8000–6000 BC	42
2.2	Central Andean region: twelve domestic plant taxa distributions, 6000–4200 BC	43
2.3	Central Andean region: twelve domestic plant taxa distributions, 4200–2500 BC	44
2.4	Central Andean region: twelve domestic plant taxa distributions, 2500–2100 BC	46
2.5	Central Andean region: twelve domestic plant taxa distributions, 2100–1400 BC	48
3.1	Map of the South-Central Andes	58
3.2	The easterly room of the house at Tebenquiche Chico	67
3.3	Excavated household compound at Tebenquiche Chico	71
4.1	Location of the United Arab Emirates	82
4.2	Third and first millennium BC sites in the United Arab Emirates	85
5.1	The Nukak territory	100
5.2	Interior of a rainy season residential camp	103
5.3	Forest clearance to open a ‘chagra’	108
5.4	Consumption of wild fruits inside the residential camp	109
5.5	Schematic profile of the forest layers	110
5.6	Nukak woman burning garbage	113
5.7	Nukak woman extracting seeds from ‘platanillo’ fruit	114
5.8	Camp floor with high concentration of seeds and shells	115
8.1	Korea: locations of sites with early rice	150
8.2	Korea: types of Mumun pottery	151
8.3	Dolmen types in Korea	154
9.1	Japan: prefectures and districts	165
9.2	Generalized cultural chronology for Japan	

	167
10.1 Map of the Atlantic coastal plain, south-eastern United States	183
11.1 New Guinea: the upper Wahgi valley and Kuk swamp	197
11.2 New Guinea: Kuk swamp	208
11.3 New Guinea: major disposal channels at Kuk swamp	209
11.4 New Guinea: evidence for the orientation and elevation of the Olgaboli ditches; and reconstruction of drained fields and major disposal channels	211
11.5 New Guinea: cross-sections of Phase 4 ditches, Kuk swamp	212
11.6 New Guinea: depths of the Phase 4 Olgaboli ditches, Kuk swamp	213
11.7 New Guinea: relationship between elevation of the palaeo-surface and the depth of the Phase 4 Olgaboli ditches, Kuk swamp	214
11.8 New Guinea: sections through the south bank of Ketiba's Baret, Kuk swamp	217
13.1 Archaeological map of the New Caledonian archipelago	247
13.2 New Caledonia: hammerstone from Lapita	249
13.3 New Caledonia: present-day taro terraces	251
13.4 New Caledonia: abandoned terraced taro-pond fields, Col des Roussettes	252
13.5 New Caledonia: map of the Kaden site	253
13.6 New Caledonia: aerial photograph of part of the Tiwaka plain	254
14.1 Viti Levu, Fiji	271
15.1 Northern Jordan	283
15.2 Northern Jordan: cultivation of summer crops on fallow land	290
15.3 Northern Jordan: harvesting olives near Irbid	292
16.1 Pakistan: location of the Bannu area	301
16.2 Pakistan: geomorphological map of the Bannu basin	302
16.3 Pakistan: prehistoric sites in the north-western Bannu basin	305
17.1 Expansion of rice cultivators in Japan, plus the expansion of the Krounovsky-Tuanjie culture	318
17.2 Japan: expansion of the Krounovsky-Tuanjie culture	319
17.3 Japan: resource changes within catchment areas of the Krounovsky culture during migration	320
17.4 Japan: social and demographic characteristics of sites and dwellings	322
18.1 Map of south-eastern Mauritania and the Middle Niger	330
18.2 Ceramics from the West African Sahel	332
18.3 Post-cranial remains of cattle, three sites, West African Sahel	335
19.1 Map of northern Syria	342

19.2 Northern Syria: the Balikh basin	343
19.3 Northern Syria: emmer wheat and einkorn wheat from late neolithic Sabi Abyad	351
19.4 Northern Syria: cereal grain proportions	353
19.5 Northern Syria: pulse seed proportions	355
19.6 Northern Syria: comparisons between proportions of cultivated and wild plants	358
19.7 Northern Syria: further comparisons between proportions of cultivated and wild plants	360
19.8 Northern Syria: cyperaceous seed proportions	360
20.1 The wild species of the Section <i>Australimusa</i>	371
20.2 Distribution of the <i>Eumusa</i> species	372
20.3 The domestication of <i>Musa acuminata</i>	376
20.4 The generation and expansion of AAB Plantain and Maia-maomi/Popoulu hybrids	377
21.1 Map of north-east Africa	388
21.2 Potsherds, Atbara sites, Nile valley	390
21.3 Imprints of cereals in potsherds, Nile valley	393
21.4 Um Direiwa, Nile valley	394
21.5 Worn-out sandstone grinders, Um Direiwa, Nile valley	395
21.6 Sorghum exploitation, Nile valley	397
21.7 Map of East Africa, the Arabian peninsula and the Indian subcontinent	398
22.1 Abundance of charred wood with depth	411
22.2 Jama valley study region	414
22.3 Abundance of charred wood by phase: all phases; excluding the early Muchique 2 phase	417
22.4 Abundance of food remains by phase: corn; other foods	418
22.5 Abundance of corn relative to other foods by phase	420
23.1 Papua New Guinea: Willaumez Peninsula, showing location of sites FAO and FRL	429
23.2 Papua New Guinea: comparison of stratigraphic layers between FRL and FAO	432
23.3 Papua New Guinea: stone artefact frequencies at FRL and FAO	434
23.4 Starch grains of <i>Dioscorea nummularia</i>	436
23.5 Papua New Guinea: starch grain from layer at FAO closely resembling modern <i>Dioscorea</i> sp.	437
23.6 Papua New Guinea: starch grains from layer at FAO resembling modern <i>Manioc esculenta</i>	438

23.7	Papua New Guinea: starch grain frequencies at FRL and FAO	442
23.8	Papua New Guinea: FRL starch grain frequencies for each size class	442
23.9	Papua New Guinea: FAO starch grain frequencies for each size class	443
25.1	Sites cultivating grain crops in the temperate Old World	469

Tables

3.1	Uncalibrated 14C dates for the house excavated in Tebenquiche Chico	66
4.1	Chronology of pre-Islamic archaeology in the United Arab Emirates	84
5.1	Nukak residential camp surface areas	111
10.1	Native American faunal summaries from Spanish Florida	186
15.1	Northern Jordan: grain production in the Hawran districts	285
16.1	Pakistan: later prehistoric sites in the Bannu basin	305
18.1	West African Sahel: size and location of Kobadi, Ndondi Tossokel and aggregate sites	331
19.1	Northern Syria: archaeological periods represented at Sabi Abyad and Hammam et-Turkman	344
19.2	Northern Syria: proportions of crop plants and wild plant taxa in various archaeological periods	350
22.1	Early occurrences of corn in the New World tropics	409
22.2	Cultural chronology of the Jama River valley	415
22.3	Macroremain database, in chronological order	416
23.1	Summary of starch extraction techniques	440
24.1	Summary of types of cropping system	454
24.2	Advantages of mixed cropping	459
25.1	Results of germination tests	473
25.2	Results from experimental cultivation of wild einkorn	475
25.3	Ratio of single- to double-grained spikelets in three wheat species	476
25.4	Major cereals, pulses and tree species from eastern Mediterranean sites	479
25.5	Comparison of percentages of cereals at four PPNA sites	481

Contributors

Tim Bayliss-Smith, Department of Geography, University of Cambridge, Downing Place, Cambridge CB2 3EN, UK.

Soren Blau, Division of Society and Environment, Research School of Pacific and Asian Studies, Australian National University, Canberra, ACT 0200, Australia.

Ann Butler, Institute of Archaeology, UCL, 31–34 Gordon Square, London WC1H 0PY, UK.

Catherine D'Andrea, Department of Archaeology, Simon Fraser University, Burnaby, British Columbia, Canada V5A 1S6.

Edmond De Langhe, Laboratory of Tropical Crop Improvement, KU Leuven, Kardinal Mercierlaan, 92, B-3001 Heverlee, Belgium.

Pierre de Maret, Department of Archaeology, CP150, University of Brussels, av. Fr. D.Roosevelt, 50, B-1050 Brussels, Belgium.

Richard Fullagar, Division of Anthropology, Australian Museum, 6–8 College Street, Sydney, NSW 2000, Australia.

Jack Golson, Division of Society and Environment, Research School of Pacific and Asian Studies, Australian National University, Canberra, ACT 0200, Australia.

Chris Gosden, Pitt Rivers Museum, University of Oxford, 64 Banbury Road, Oxford OX2 6PN, UK.

Randi Haaland, Historical Museum, University, 5007 Bergen, Norway.

Alejandro F.Haber, Escuela de Arqueologia, Universidad Nacional de Catamarca, Salas Martinez 464, 4700 Catamarca, Argentina.

Christine A.Hastorf, Department of Anthropology, University of California, Berkeley, California 94720, USA.

Jon Hather, Institute of Archaeology, UCL, 31–34 Gordon Square, London WC1H 0PY, UK.

Lesley Head, School of Geosciences, University of Wollongong, Wollongong, New South Wales 2522, Australia.

Robert Kuhlken, Department of Geography and Land Studies, Central Washington University, Lind Hall 119, 400 E. 8th Avenue, WA 98926–7420, USA.

Helen M.Leach, Department of Anthropology, University of Otago, PO Box 56, Dunedin, New Zealand.

Kevin MacDonald, Institute of Archaeology, UCL, 31–34 Gordon Square, London WC1H 0PY, UK.

K.L.Mehra, 38 Munirka Enclave, New Delhi 110067, India.

Sarah Milledge Nelson, Department of Anthropology, University of Denver, 2130 Race

Street, Denver, Colorado 80208, USA.

Carol Palmer, Department of Archaeology and Prehistory, University of Sheffield, Northgate House, West Street, Sheffield S1 4ET.

Deborah M.Pearsall, American Archaeology Division, University of Missouri, Swallow Hall 103, Columbia, Missouri 65211, USA.

Gustavo G.Politis, Aqueologia, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Paseo del Bosque, La Plata 1900, Argentina.

Elizabeth J.Reitz, Museum of Natural History, University of Georgia, Athens, GA 30602–1882, USA.

Christophe Sand, Département Archéologie, Service des Musées et du Patrimoine de Nouvelle-Calédonie BP: 2393, Nouméa, New Caledonia.

Andrew Sherratt, Department of Antiquities, Ashmolean Museum, University of Oxford, Beaumont Street, Oxford OX1 2NP, UK.

Michael Therin, Department of Archaeology and Anthropology, The Faculties, Australian National University, Canberra, ACT 0200, Australia.

Ken Thomas, Institute of Archaeology, UCL, 31–34 Gordon Square, London WC1H 0PY, UK.

Robin Torrence, Division of Anthropology, Australian Museum, 6–8 College Street, Sydney, NSW 2000, Australia.

Willem van Zeist, Biologisch-Archaeologisch Instituut, Rijksuniversiteit Groningen, Postsraat 6, 9712 ER Groningen, Holland.

Yuri E.Vostretsov, Institute of History, Archaeology and Ethnology of the Peoples of the Far East, Russian Academy of Sciences, Far Eastern Branch, 89 Pushkinskaya St., Vladivostok 690 600, Russia.

George Willcox, CNRS, Institut de Préhistoire Orientale, Jales 07460, Berrias, France.

Preface

This book is based around a session at the Third World Archaeological Congress, held in New Delhi in December 1994, but it also differs from the structure of that session in a number of significant respects. First, not all of the papers given at the session have been published here. In particular, there was a group of papers by Indian contributors, which, for a variety of reasons, have not come to publication. On the other hand, the editors (aided, as ever, by Peter Ucko) have recruited new papers to attempt to ensure a good geographical coverage and consideration of a wide range of topics. In the end, consideration of different regions has been reasonably wide, although we had hoped for more papers on Africa and certainly more by African scholars. The fact that Europe has received little attention is unintentional, but not of concern given the general rate of publication on European topics.

The editors would jointly like to thank Mekund Kajale for the very active role he played in encouraging Indian papers given at the conference and to the actual organization of the conference session itself. Deborah Pearsall was active in recruiting American contributions for the conference, but was precluded by pressures of work from engaging in the editing of this volume. We thank David Harris for the active role he played within the original conference session. Peter Ucko has recruited some of the papers for this volume and has provided encouragement and applied pressure when needed, to both authors and editors. Chris Gosden would like to thank the Research School of Pacific and Asian Studies at the Australian National University in Canberra where he carried out much of his editing whilst a Visiting Fellow during 1997.

Introduction

CHRIS GOSDEN

FOOD: WHERE BIOLOGY MEETS CULTURE

The study of food is one of the growth areas within academia at present. Food is good for thought, as well as eating, because it spans all areas of human life. It is obvious that food is necessary for physical survival, but it has become equally apparent that food is vital in constructing culture. Anthropologists have analysed the political and sensual uses of food in constructing cultural categories, but archaeologists have also come to realize that cultures are constructed over long periods of time and in the process of this construction the interaction between people and plants has been vital. Discussions of plants take us into the realm of biology where the genetic and biochemical properties of plants come to the fore, plus also the long-term interaction of people and plants. It is this interaction of people and plants that marries and blurs our dichotomous notions of nature versus culture. Although it is true that people have shaped plants over many millennia, it is equally so that plants have altered human patterns of life; we are therefore dealing with a mutual dependence of people and plants in intertwined histories.

The central thread of this book is the meeting of the cultural and biological in terms of both the material being studied and the disciplinary emphasis of those doing the studying. In order to understand the long-term history of food we need detailed knowledge of the ecological requirements of plants, their genetic changes over time, and we need methods suitable for the recovery of plant material from archaeological sites. Of equal necessity is a knowledge of how people construct the world around them through the categories of their culture, how they approach landscapes, divide edible from inedible things and attempt to change the world to their benefit. There has been all too little communication between those with a sound ecological and genetic knowledge and those interested in how cultures work and change. This is partly because food has been studied as lying within the ecological and the economic realms, whereas culture has been about artefacts and their meanings. But if food is culture as well as nutrition, then these divisions start to break down. This book aims to help break down such divisions and, although it is not

possible or desirable to come up with a seamless synthesis of differing points of view, it may be possible to explore common ground and create new forms of dialogue.

Archaeological discussions of food and subsistence have tended to be rather limited, concentrating mainly on food as the basis for the economy, rather than as an element of culture. In this, archaeology still takes its lead from the nineteenth-century view that subsistence was one of the main motors for history, which created such abiding dichotomies as that between hunter-gatherers (or savages in L.H.Morgan's ([1877] 1985) scheme) and farmers (barbarians for Morgan). These ideas were given more theoretical bite and empirical richness in Childe's idea of the neolithic revolution as a great leap forward which underwrote those other revolutions, the Urban and the Industrial. Human history has been seen to march on its stomach and this view has some truth to it, but the major concentration on the production of calories and surplus has led to a concentration on domestication and its role in the invention of agriculture. Recent work by Harris (1989, 1990) has shown that farming and hunting and gathering are not polar opposites, but that there is a whole spectrum of practices ranging from the cultivation of wild plants to intensive agriculture based on domesticated forms. Here the degree of alteration of the landscape as a whole, the effort put into tillage and the genetic alteration of particular species interact in a complex and changing manner which cannot be encapsulated in the simple division between farming and gathering. Once a greater complexity of techniques and processes is acknowledged, this opens the way for a broader consideration of choice and why people take certain options not others. Choice leads us back to culture and the cultural logics underlying approaches to the landscape and food.

This book tackles the broad issue of setting subsistence in its social context but also attempts to make use of new evidence coming out of genetics and new syntheses of archaeological evidence of plant exploitation. In this introduction I want to look at the range of topics to which the study of food can lead us and these include introductions (or resistance to introduced crops), conceptions of landscapes, the social imperatives for landscape use and the linked history of plants and peoples to show the various ways they are being embraced by the rich mixture of chapters in the present volume.

FOOD AND CULTURE

Much effort has been expended by anthropologists in demonstrating that food is a cultural category which provides the raw material for systems of thought, as well as reflecting social divisions (Douglas 1972; Goody 1982; Lévi-Strauss 1969). Less work has been done along these lines by archaeologists, although Hodder's *Domestication of Europe* is an honourable exception here. Hodder (1990) has attempted to rethink the notion of domestication and sees neolithic societies as attempting to domesticate themselves as a means of coping with the tensions brought about by a new, settled form of life. Social domestication involves the creation of a plethora of new symbolic forms,

developed to cope with the threat that nature, in the form of wildness and death, poses to culture. Hodder's work is deliberately provocative, using the overall structuralist tradition of thought to demonstrate that there was more to early neolithic life than the breeding of plant and animal species which gave higher yields in nutritional terms.

A number of the chapters in the present volume take a somewhat similar tack, but in a manner which links the argument about cultural categories and their changes more directly to food. Sherratt argues against the notion of subsistence and feels that means of growing plants throughout Eurasia changed due to a complex series of motives of taste and economics, such that innovation often occurred in plants that might be considered to be luxuries and not the staples. This follows arguments he has made elsewhere (Goodman *et al.* 1995) about the importance of situating food and drugs within patterns of consumption as a whole. One of the benefits of emphasizing consumption is to tie food into material culture, so that the pots to prepare or eat food are indicative of where and how consumption took place, plus the sets of cultural categories lying behind different forms of food and drink.

Hastorf explores similar themes in the Andes, making the point that plants adding taste and zest to food, like chillies, were the first to be domesticated and reflect profound social changes rather than an improvement in the economic basis of society. Also in South America, Haber tackles the notion of domestication and the ambiguous position of llamas in this respect, pointing out that animal herding cannot be divorced from the use of space both domestically and within the landscape as a whole. Once again subsistence is being brought home as an element of culture and culture change.

Appadurai (1981, 1988) has shown how the sensory nature of food, which is able to evoke memory and create present associations, is a powerful element within contemporary Hindu politics and culture. Anthropologists are less able to deal with long-term change in these aspects of life than archaeologists, and a number of studies in this volume look at both domestication of local resources and the adoption of new crops from elsewhere. Mehra, discussing the Indian subcontinent and providing some potential prehistory for Appadurai's argument, argues that although introductions of wheat, millet or rice have been vital in shaping southern Asian agronomy, the importance of locally domesticated crops should not be underestimated and it is the interaction of the local and the novel that holds the real key to agriculture in the subcontinent. There may be some deep structure to the distinctions that Appadurai sees people making in the present, deriving from the prehistoric use of plants.

More contemporary examples of change and resistance are provided by Blau and Leach. Leach looks at the specific introduction of the *Solanum* potato in New Zealand and how far its use fitted into existing Maori practices of food processing, particularly of the sweet potato (itself a prehistoric introduction into New Zealand). She also makes fascinating contrasts between the history of the potato in the Pacific and its original reception in Europe (see also Salaman 1985), where it passed from ornamental to staple with considerable speed. Similar complex histories are found with other plants, such as sugar (Mintz 1985). Blau makes a broader link between changes in the post-war period in the United Arab Emirates due to the sale of oil, which has brought in new foods and lifestyles, and periods of change in prehistory in the same area judged from skeletal

analysis viewed against a background of the botanical evidence. Once again diet is viewed as an element of lifestyle, as people change their habits to maintain their place within a changing cultural field.

The question of the acceptance of novel and foreign resources is not a trivial one, as much of the world's food grown over the past 5,000 years has been introduced from other areas. Introductions are so important and widespread that they can provide a basis for global comparisons. A number of chapters explore the impact of crops from a more strictly economic point of view. The domestication and spread of rice has long been controversial (Glover and Higham 1996) within Asian prehistory, Nelson explores the impact of rice as a new crop in Korea and its links to new forms of monumentality and society. Working on a broad range of plant species, Andrea looks at the complexity of ecological and economic factors influencing the introduction of new domesticates into one area of Japan, the north-east. A reverse case, which combines archaeological and historical evidence, is provided by Reitz for Florida from the Spanish period onwards. Here rejection was the main response to new animal species, which could not be fitted within existing cultural categories and patterns of practice.

FOOD AND THE LANDSCAPE

A major area of present interest within both archaeology and anthropology is in the landscape as both a producer and product of social forces (Bender 1993; Hirsch and O'Hanlon 1995). All aspects of the social process have some spatial expression, and space is not an abstract geometry but is lived and worked on. Landscapes are human creations, but equally people are shaped by the landscapes they have made, these being the material settings into which the young are socialized and which become part of their social being. Landscapes have implications for the manner in which practical skills are developed and deployed, plus differences in the use of the landscape deriving from gender or social standing. Bayliss-Smith and Golson look at the most famous prehistoric agricultural site in Papua New Guinea: Kuk swamp, which has a sequence spanning some 9,000 years. Their careful analysis of the ditches that drained the swamp in one phase in terms of the social forces that created them is one of the most detailed pieces of work linking features of the landscape to the organization of labour, gender and political aspirations. On a broader and necessarily more superficial level, Gosden and Head explore the old question of the distinction between Australia and Papua New Guinea, making the point that if subsistence is taken as the main point of distinction, it is only possible to emphasize differences between Australia as a continent of hunter-gatherers and Papua New Guinea, a country of farmers. However, if different elements of attachment to the landscape are emphasized then more of the shared history of the two areas comes into focus. Also in the Pacific, Sand emphasizes the human creation of the landscapes of New Caledonia throughout the period of human occupation over the last

3,000 years, particularly the construction of widespread terraced systems only abandoned after the coming of Europeans. Kuhlken takes a different tack and looks at the manner in which social forces, especially the political competition that impelled groups in Fiji towards warfare, were a major impetus for intensification of agriculture. Farming and fighting, which could be glossed as ploughshares and swords in the western idiom, might seem to us to be contrasting elements of life, but in many areas of the world have been joined through the demands of the political process.

In a very different cultural context, Palmer looks at the links between history and land in Jordan and links the history of the social relations of the group to patterns of land ownership and how both of these have changed in the recent past as the result of local people becoming enmeshed in changing external political structures. The parcelling up of land in both a social and a legal sense is part of a knot of social forces stretching way beyond the group, but is also worked through on a daily basis through labour on the land.

Thomas's chapter explores the impact that landscapes on the frontier of different geographical zones have had on human history. In his case, it is the borderlands between Pakistan and Afghanistan which are of interest, with their mix of mountains and plains which create a complex of long-distance routes to be travelled by pastoralists and basins between the mountains where settled agriculturalists dwelt. Since the Neolithic, the balance between pastoralism and settled agriculture has been crucial to local ways of life, but also to long-distance connections with Central and Southern Asia. Vostretsov is most concerned with the impact that changing sea-levels throughout the Holocene have had on the coastal economies of mainland areas north of the Japan Sea. Coastal change has not only affected people living near the sea, but also the balance between coastal and inland economies and the complexity of their development through the Holocene. Similarly, for West Africa MacDonald argues that individual aspects of the economy cannot be considered in isolation. It is especially the case that settled forms of life and pastoralism have been mutually influencing, although it is an unfortunate fact of archaeological life that the mobile lives of pastoralists have left only ephemeral evidence behind them. At a micro-scale, van Zeist's detailed consideration of the Balikh Valley, Syria from the point of view of plant crops, emphasizes the shifting balance between the cultivation of the valley bottom and the higher plateau regions. He lays out the complex of forces influencing choices in this regard, which range between the level of population and the social demands for a particular quality of crop, reminding us that choices about growing food link the demographic and the social.

PLANTS AND PEOPLE

Plants could be said to have a social life and a history as they participate in people's creation of space and time. As mentioned earlier, a simple scheme of domestication and then intensive cultivation may not be adequate to look at such histories. We also need to

look both at the cosmological schemes within which plants are used and at what might be called their context in the world system. Many plants are moved around through sets of social connections and trading connections, and their eventual domestication or diversification into new species may happen well outside their original ranges. We are not looking at delimited hearths of domestication, where new types of animals and plants were bred into being, but rather at complex overlapping histories of plants and people which may not alter the plants genetically at all.

Balée (1994) has looked at how history is created and maintained through people's knowledge of trees within the Amazonian rainforest. Politis explores the ideology lying behind rainforest exploitation by the Nukak and shows how plants and animals are used to create cultural categories and histories. The rainforest, which appears to western eyes as an untouched wilderness, is used according to a set of cosmological schemes and is also a historical product altered continuously by its human inhabitants. Particular plant species have complex linked histories with people, as De Lange and de Maret show for the banana. The banana is now dependent on people for its propagation, but many groups rely on different sorts of bananas for a major part of their livelihood. This linked history spans many millennia and can be elucidated through a combination of genetic, archaeological and linguistic research. Sorghum in the Nile is the focus of Haaland's attention, and she explores the problem of the sequence of cultivation and domestication and uses sorghum as a possible example of a plant domesticated outside its area of origin. Together the chapters by De Lange and de Maret and Haaland show the complexity of the movement of plants in areas around the Indian Ocean and that plants have moved both east and west to alter people's lives fundamentally.

The slow adoption of a plant also seems to be the case in Ecuador, where people took up the use of maize over a period of centuries rather than suddenly. An important element of Pearsall's story concerns our ability as archaeologists to recover evidence, such as phytoliths, in a consistent manner which can provide a rounded picture of long-term change. Therin, Fullagar and Torrence report a potential breakthrough in the recognition of starch in archaeological sites. In the Pacific, as many other areas of the world, starch from root and tree crops plays a large role in people's diet, past and present. Evidence for starchy foods is extremely difficult to recover, especially in the humid tropics. New techniques of recovery and analysis may make it possible to discover starch both on the edges of stone tools and in the sediments which compose archaeological sites. Therin *et al.* are cautious in their conclusions, stressing much future work on techniques is necessary, but they foresee the possibility of tracking changes in the uses of food over the last few millennia which will open up new areas of understanding of the role of food in prehistory.

A final emphasis on the complexities of influences on the growing of food, and consequently the sets of evidence we need to combine in order to understand food in prehistory, is provided by the chapters by Butler and Wilcox. Butler provides a uniquely broad survey of the range of seed cropping systems which exist in temperate areas of the Old World, plus the botanical and ecological limits on these systems which can allow an understanding of the biological parameters within which prehistoric peoples worked and thus the constraints on social choice. Wilcox tackles that hardy perennial, the origins of

agriculture in the Near East, using an impressive range of sources ranging from a botanical understanding of wild species, to experimental work and the results of analyses of early neolithic plant assemblages, again showing the range of change that happened in different areas and time periods.

CONCLUSIONS

In anthropology food has become a major topic because all human life is there: the landscape and its histories, patterns of consumption as an element in the creation of cultural categories, problems of aesthetics and taste (to use this latter term in two senses), links to the body and embodied experience and food as a reflection of symbolism and structures of thought. Archaeology can tackle all these topics related to food, albeit in a manner consonant with the nature of our evidence, which emphasizes the long-term histories of food and people. Where anthropology can look at food as a cultural category, archaeology can probe the long-term differentiations and changes in the cultural uses of food. An anthropological analysis of landscape has limits as far as time depth is concerned, but through archaeology there is the possibility of a linked history of sediments, society and plants. A more novel area which needs much further exploration is the conjoined history of people and particular plant species, where there has been a mutual process of domestication, so that people's patterns of life are partly structured around the requirements of plants in the same manner as the physical needs of the plants have been reconfigured by people.

Archaeology differs from anthropology not just through the possibility of understanding long-term change, but also in the indirect nature of our evidence. Much work needs to be done to develop new recovery techniques, especially for ephemeral plant remains, and to understand the requirements of climate and soil of different species. An archaeological interest in food will always hover on the borderland of the technical and the social in a manner which will be both productive and uncomfortable. Some, including a number of contributors to this volume, will feel that I have here emphasized the social and cultural side of food rather than the environmental and the economic, and all our views echo deep divisions within archaeology between the humanistic and the scientific. My aim here has not been to assert the primacy of the humanistic, but to indicate that an interest in the prehistory of food can help provide dialogue across the divide, even though the division itself still remains. The chapters in this book show that thoughts about food in prehistory are changing and that with a proper combination of the theoretical and the technical a rounded disciplinary approach is possible, which will do justice to the richness of the subject-matter.

REFERENCES

- Appadurai, A. 1981. Gastro-politics in Hindu south Asia. *American Ethnologist* 8, 494–511.
- Appadurai, A. 1988. How to make a national cuisine: cookbooks in contemporary India. *Comparative Studies in Society and History* 30, 3–24.
- Balée, W.L. 1994. *Footprints of the Forest. Ka'apor ethnobotany: the historical ecology of plant utilization by an Amazonian people*. New York: Columbia University Press.
- Bender, B. (ed.) 1993. *Landscape: politics and perspectives*. Oxford: Berg.
- Douglas, M. 1972. Deciphering a meal. *Daedalus* 101, 61–82.
- Glover, I.C. and C.F.W.Higham. 1996. New evidence for rice cultivation in South, Southeast and East Asia. In *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, D.R.Harris (ed.), 413–41. London: UCL Press.
- Goodman, J., E.Lovejoy and A. Sherratt (eds) 1995. *Consuming Habits: drugs in history and anthropology*. London: Routledge.
- Goody, J. 1982. *Cooking, Cuisine and Class*. Cambridge: Cambridge University Press.
- Harris, D.R. 1989. An evolutionary continuum of people-plant interaction. In *Foraging and Farming: the evolution of plant exploitation*, D.R.Harris and G.C. Hillman (eds), 11–26. London: Unwin Hyman.
- Harris, D.R. 1990. *Settling Down and Breaking Ground: the evolution of plant exploitation*. Twaalfde Kroon-Voordracht. Amsterdam: Stichting Nederlands Museum voor Anthropologie en Praehistorie.
- Hirsch, E. and M.O'Hanlon (eds) 1995. *The Anthropology of Landscape: perspectives on space and place*. Oxford: Oxford University Press.
- Hodder, I. 1990. *The Domestication of Europe*. Oxford: Basil Blackwell.
- Lévi-Strauss, C. 1969. *The Raw and the Cooked*. London: Jonathan Cape.
- Mintz, S.W. 1985. *Sweetness and Power: the place of sugar in modern history*. Harmondsworth: Penguin.
- Morgan, L.H. [1877] 1985. *Ancient Society*. Tucson: University of Arizona Press.
- Salaman, R.N. 1985. *The History and Social Influence of the Potato*. Cambridge: Cambridge University Press.

Part I
FOOD AND CULTURE

1
*Cash-crops before cash: organic consumables
and trade*

ANDREW SHERRATT

Archaeology, like the rest of western thought, suffers from over-compartmentalization. Too often its procedures take the form of analysis—breaking down, dividing—rather than combining and synthesizing. Such separating procedures are useful where they foster specialist skills, but dangerous if their subject-matter is left in isolation. The purpose of this contribution is to assert that the word often used to describe an important part of our subject-matter—‘subsistence’—is not an autonomous domain, but is best considered as one aspect of a larger set of relationships. ‘Subsistence’ is a misleading category within which to work; the textbook division between ‘subsistence and settlement’ and ‘trade and exchange’ should be abolished as a hindrance to understanding.

THE MYTH OF ‘SUBSISTENCE’

Although masquerading as a neutral, descriptive term, ‘subsistence’ is in fact heavily freighted with intellectual baggage. It has two principal uses in modern English: to describe the economies of far-away regions, and to specify an element of allowable *per diem* expenses after second-class travel by rail. Its use in the latter context clearly has a moral content: it is a bureaucratic warning against the temptation to potlatch. ‘Mere subsistence’ implies just enough to keep body and soul together: enough to stay alive without transmitting messages about social superiority. The very employment of the term implies the constant danger of the behaviour which it forbids. Such motives also underlie its more general usage: the whole concept is actively constructed in opposition to an accurate depiction of everyday reality. It is, in short, a rhetorical rather than a scientific term: a utopian representation of a world without ostentation and cupidity. Like many other unstated assumptions of contemporary discourse (because social theorists are usually also social reformers), it has its roots in Puritanism, and in a moral stance in relation to conspicuous consumption rather than as an accurate description of the real world.

Whence, therefore, its widespread employment in archaeology as a general term to describe food-getting, which in everyday experience is so rarely divorced from considerations of social image and ideological negotiation? The answer lies in the recent intellectual history (and disciplinary politics) of development studies and economic

anthropology. Careful to avoid the established territory of classical economics, with its focus on the market, these newer disciplines defined their subject-matter as those societies which were so far untouched by the blandishments of ‘the market’ and market forces. Such a conception was inevitably the reconstruction of a postulated past reality rather than the description of a present one, since the societies in question had almost without exception been subjected to the classic sequence of contacts: merchants, soldiers, missionaries, colonial administrators, anthropologists; and following the Heisenberg principle which governs anthropological investigation (the fact that by the time you can observe a community, it is no longer what it was before contact), had to reconstruct conjecturally what might have been its pristine condition. Mentally removing the Levis and substituting bark loincloths, therefore, they described a community existing completely without external contacts and living entirely by autsubsistence—ignoring the fact that the imported commodities replaced precisely those indigenous meaning-laden manufactured products which were most likely to have been traded and negotiated between communities. They thus replicated the romantic myth of western anthropology, of a set of isolated communities comprehensible as independent social microcosms—created by purging what they could actually observe from the supposed ‘pollution’ of outside influence, in an ironic parody of their own description of the thought-processes of the natives.

In so far as there exist communities which might be described as possessing ‘subsistence’ economies, it is not those as yet untouched by the world system, but rather those most closely enmeshed in it but impoverished by it. Throughout the Third World there exist peasantries which dutifully pay their taxes to local elites, but whose countries are systematically exploited by the unequal balance of exchange between raw material producers and metropolitan manufacturers who cream off the added value (‘the man from Del Monte says “Yes”’, as the television advertisement succinctly encapsulated it). Doubly burdened by their international and national position in contemporary social structures, the peasantries of such countries unsurprisingly have little disposable income with which to acquire much beyond the bare necessities of life—if that. They might thus, with justification, be described as representing a ‘subsistence economy’. To treat such societies as in any way paradigmatic of the natural condition of humankind, however, is to extrapolate a late and atypical situation as a model for the greater part of human existence. This is methodologically unsound. The attempt to isolate a sphere of prehistoric existence as ‘subsistence behaviour’ is bound to fail. We should, in fact, be more alert to the tradable potential of many organic products.

SHEEP AND OLIVE TREES: ‘SUBSISTENCE’ OR ‘EXCHANGE’?

At a trivial level, the point is an obvious one. There are no sharp dividing-lines along a continuum of prehistoric objects constituted as follows: a rock like marble, traded for making ornaments; a mollusc like *Spondylus*, traded for its shell; a mollusc like *Ostrea*, gathered for its meat; and a sea-bird, shot or caught for food. Even in the last case, there may be feathers which can be used—and even traded, if they are attractive; most animals

yield non-food products such as bones, sinews, hides, and so on, many of which are widely in demand. (Think how many antler picks a neolithic flint-miner would get through.) Nor are plants usually restricted simply to providing food. Here, too, exploited species are often characterized by multiple uses, like hemp as fibre (stem) and narcotic (flower, leaves); or palms, which support a huge range of products and uses. Corn-stalks can be used for thatching, or even for making corn-dollies—and straw baskets have actually been found in the PPN B desert cave of Nahal Hemmar, Israel, dating back 10,000 years almost to the beginnings of Old World cereal cultivation (Kislev and Bar-Yosef 1988:176). This is not, therefore, a trivial consideration. Besides the food element, there is almost always some other product—which is usually called ‘secondary’, even though in many cases (like *Spondylus* shell, which lives in deeper water than *Ostrea* and is usually found washed up) the non-food element is of primary interest, and the meat is a secondary consideration, if not irrelevant. There is often a long-term shift from primary to secondary products: palaeolithic hunters ate elephant-meat but left the tusks; now ivory-poachers leave the meat to rot.

The term ‘secondary products’ is principally employed to describe those products that can be extracted continuously without killing the organism—like milk and wool, as opposed to meat. This does not generally include bones, horn, hide, etc., though these might usefully be called secondary terminal products—a useful reminder that the more precise term for milk and wool would be secondary *life* products. In this sense, the analogy with the vegetable kingdom would be something like rubber, which can be tapped throughout the life of the tree: the term applies particularly to perennials, including many kinds of fruit trees. Olive-oil, in this sense, is a ‘secondary product’ of the olive tree. What these secondary live products often have in common, whether they are derived from animals or plants, is that the materials which they continuously yield can often be converted to more valuable forms by some further kind of work. This is what unites sheep and rubber trees: they yield commodities. While the types of economy that specialize in tree-crops, and those that specialize in animal products, might be considered as somehow antithetical—since the former demands sedentism while the latter is often associated with mobility—this does not mean that they are unrelated. Indeed, in the history of Old World farming, they were closely associated. Both appeared some time after the initial development of farming, but before the onset of urbanism, in the Chalcolithic (sixth to fourth millennia cal. BC); and they involved species or breeds which had not been represented amongst the earliest domesticates. The Ghassulian culture of the southern Levant was a pioneer in both tree-crops and animal-herding for milk (much as the earliest inhabitants of Jericho simultaneously attempted to grow cereals and chase gazelle); although these soon became the activities of specialized social groupings, they were initially common responses within a single society and historical context (Levy 1992). (Moreover the Ghassulians were also spectacularly expert copper metallurgists, symptomatic of their extensive search for raw materials and ability to trade in them.) Their common incentive was the specialized secondary live products: wool and milk on the one hand, olive and grape on the other. These products have some further properties in common: they are commodities which can be traded, and especially so if they have been processed to some degree. Indeed, all of them share the property that they

can be processed to many degrees, and with the appropriate skill and knowledge can gain in value at each transformation, until one has such valuable products as the robe of Athena (the *palladion*), or a *premier grand cru*. In this respect these products perhaps resemble metals or semi-precious stones as much as they do cereal-porridge or a lump of meat; organic commodities have as much potential for trade as inorganic ones.

CASH-CROPS BEFORE CASH

There is thus a measure of parallelism in the human uses not only of animals and plants but also of inanimate materials: wool, olive-oil and copper are coeval. All require technological knowledge, skill and investment both in productive facilities and in distributive networks. Whilst the specialist study of their remains requires differing backgrounds in zoology, botany and metallurgy, their archaeological significance lies in their common social and cultural contexts and uses. This common field is the domain of value and exchange: quite the opposite of what is commonly implied by the word 'subsistence', which has the sense of basic nourishment—but nothing more. Best, then, to drop the phrase 'subsistence systems' altogether, since one of the deleterious side-effects of this phrase is to create an artificial expectation that inorganic products can be traded but organic products are largely consumed locally. This is reinforced by their differential survivorship in the archaeological record. It is taken as a truism that attractive stones or sea-shells are typical objects of stone age trade, often transmitted over long distances, without pausing to consider that furs may have been equally mobile, or even narcotics (a highly desirable item of Australian aboriginal exchange systems is, of course, *pitcheri*). Feathers, in particular, are known ethnographically (especially, because of their colourfulness, from tropical regions) as traded commodities of high value. But there may also have been traded subsistence products, or at least diet-enhancers (like salt, often traded over long distances among groups with a largely vegetable diet) even in the Palaeolithic. In a recent article, Schmitt (1994) has suggested that seals, abundant on islands in the nutrient-rich waters of the Yoldia Sea narrows in the Late Glacial, were extensively culled for the procurement of blubber and the production of train-oil (nothing to do with oiling railway-trains, but cognate with German *Tränen*, tears or droplets, obtained by boiling the blubber), that was widely desired amongst the hunting populations of the North European Plain, because of the problems caused by a diet consisting predominantly of lean meat. (Where such maritime products are not available, Boreal hunters may expend much energy in rendering reindeer bones to produce 'bone-grease', which has similar nutritional/dietetic properties.) Marek Zvelebil has reconstructed the circulation of similar commodities for the Mesolithic in the Baltic region (1996: figs 18.7, 18.8); and among the illustrations of the equipment of the north-east Siberian Samoyed in Friedrich Ratzel's *Anthropo-Geographie* of 1882 is a container made from a swan's foot for carrying this substance. (It takes imagination to restore this item to the archaeology of Mesolithic Denmark!)

Traffic in substances such as these, even after the beginning of farming, would make sense of the cultural prominence of islands like Orkney, which (in the Neolithic and

Bronze Age, when they have an especially rich artefactual and monumental record) were not stepping-stones on routes of long-distance communication to larger areas but constituted a terminus or *ultima Thule* at the end of the known world. It is their richness in high-vitamin sea-products, concentrating a huge radius of marine productivity through their bird and sea-mammal faunas, which provided compact and desirable products that could be traded to the mainland and potentially far beyond. Accustomed now to industrial substitutes, we have lost our appreciation for commodities (like goose-grease) still valued only a generation or so ago. As Grahame Clark records (1952:77), some of the inhabitants of Orkney paid their rent in seal-oil in the last century. Such commodities take their place alongside the many other kinds of organic materials and products known ethnographically as important items of trade, including plants cultivated specifically for this purpose. There is archaeological evidence for the movement of honey over rather a long distance, and of pig fat probably over a somewhat shorter one (Dickson 1978; Needham and Evans 1987).

Recognition of the importance of organic products in trade allows us to 'unfreeze' a useful concept, hitherto confined to the historical period, and to generalize it for further use: the idea of cash-crops. The defining characteristic of a cash-crop is that it is grown specifically for exchange, rather than for local consumption. In this sense, most modern cereal-growing is undertaken on this basis, though the term is usually used of commodities other than the basic calorific staples. Tree-crops are almost always in this class, since plantations require long-term investment and economies of scale. The appearance of vine and olive through the Mediterranean was thus embedded in a process of economic and infrastructural development, as discussed below (pp. 19–21). Products such as olive-oil are highly exchangeable commodities, and were exported long before the formal appearance of 'cash' (coinage) in the sixth century BC—though the term usefully reminds us that the economic liquidity of such transaction networks depends critically on a medium of exchange, and usually a metallic one (typically silver, though copper/bronze performed an analogous function in earlier contexts). Metallic media of exchange are not, however, a *sine qua non*; for on occasion tree-crops themselves have served as currency (standards and media of exchange), much as Marlboro cigarettes—narcotic leaf-crop products—did in parts of the former USSR. The use of theobromine-rich cacao as precisely such an exchange medium in Classic Mesoamerica gave Rene Millon the opportunity to use the only genuinely humorous dissertation title I know: 'When Money Grew on Trees' (1955). This is perhaps the most literal kind of cash-crop: the crop itself is the cash. Many of the crops brought into cultivation in the 'second phase' of farming (parallel to the emergence of secondary animal products, uses and domesticates) were cash-crops in the less literal sense of producing commodities for exchange, and thus forming part of a spatial process of regional specialization.

The examples cited above, however, show that certain species had been exploited primarily for the exchange-value of their products even by palaeolithic groups: 'cash-crops' not merely before cash, but even before farming and domestication. In this respect, the contrast between stone age Sweden, exporting seal-oil, and the bronze age Levant, exporting olive-oil and wine in specialized containers (jars and jugs) by sea to Egypt and Cyprus, is one of degree rather than of kind. In principle, there is no difference: stone age

economies were not *ipso facto* simply subsistence economies. What opens up as a field of research and a fruitful area of model-building is the story of trade in organic commodities (both alive and dead, raw and processed), as part of the story of trade and exchange as much as of subsistence and settlement. Indeed, to the extent that 'subsistence' is a dangerously misleading concept, its abolition opens the possibility of telling the story primarily as a chapter in cultural and social history, instead of part of some autonomous realm of economics or simple nutrition. Cash-crops are about value, and thus about evaluation, desire and culturally constructed modes of consumption.

Such a process of valuation necessarily creates opportunities for middleman profit. All crops possess some kind of rarity value when they are initially in short supply; and if they have some generally desirable characteristics (taste, ease of digestion, appearance) may be 'cash-crops' all around the perimeter of the area within which they are grown, and beyond which they are desirable novelties. It is this point which was grasped ten years ago by Runnells and van Andel in 'Trade and the origins of agriculture' (1988), following an older insight by Kent Flannery; if agriculture is essentially the movement of plants and animals out of their natural habitats to new niches under human agency, then their transmission between people is a negotiated transaction, and can be considered under the general rubric of 'trade'. 'In a sense we are saying that "cash-crop" farming was a phenomenon as old as, and perhaps older than, subsistence farming' (Runnells and van Andel 1988:97). I would go further: what is called 'subsistence farming' is the exception—a late phenomenon of global specialization which has little to do with prehistory.

ROLE AND POSITION: WORLD-SYSTEM ZONATION

The initially paradoxical concept of seals as a 'cash-crop' in a pre-cash, pre-agricultural economy is repeated more recently in a whole range of commodities, such as ivory, leopard skins and ibex horns, which are acquired by hunting but are nevertheless traded over long distances across the zones of the world system. Interestingly, such commodities have been the subject of an arcane controversy amongst world-systems enthusiasts over the status of Canada and Siberia within the European world-system of the eighteenth century. This argument (i.e. that of a 'fur periphery') can only be reconciled with Wallerstein's concept of the periphery if such hunted commodities as slaves and furs are to be equated with 'cash-crops, agricultural or analogue forms of primary sector production' (Wallerstein 1989:138). If Wallerstein accepts timber and dye-wood, which are collected in natural forests, why not furs and slaves? Instead these are only accepted at the first stage of transition when an external arena becomes incorporated (Nitz 1993:17–18). It is not necessary to follow the scholastic finesse of this argument to recognize that the outer edges of the world system are characterized by the exploitation of natural resources by the cropping of wild populations, rather than the more capital-intensive process of rearing and culling. It is instructive that this description could apply to the economy of Egypt in the fourteenth century BC as easily as it could be accepted for the world two centuries ago. (It is also amusing that the phrase 'leopard-skin accessories'

is applied today in parody of the contemporary motor trade—when the ‘leopard skin’ is an ersatz printed textile—in a way precisely parallel to that in which an Egyptian chariot-maker, using the real thing, might have described the vehicles of Tuthmosis or Tutankhamun!)

The cropping of wild resources on the outer edge of the system (like King Solomon’s Red Sea expedition to Tarshish in I Kings 10.22, bringing back ‘gold, silver, ivory, apes, and peacocks’) makes sense in an arrangement where the value is added nearer to the centre, on the Del Monte principle alluded to above; as the system grows and differentiates, it develops a zonation in which native populations are used as intermediaries in the outermost zone in exploiting primary terminal products, through a zone in which unfree labour is used in exploiting secondary live products, to an inner zone in which skilled (though often dependent) labour is used to add value to the products of the other two in a variety of manufacturing processes. The first of these produces largely raw materials, the second of them half-finished commodities, and the innermost one the fully manufactured product. The characteristic of the core, therefore, is its lengthened chains of processing, which often require highly specific processes and ingredients in small quantities at appropriate points in the manufacturing process—like valonia acorns (the cups of *Quercus aegilops macrolepis*, used in tanning fine leather), or *Murex* shellfish and saffron for the purple and orange dyes used in the production of luxury cloth. The central zone is thus characterized particularly by its knowledge (both technological and spatial), and by its reticulating web of contacts. Such areas produce not just olive-oil but perfumed olive-oil, enhanced by added extracts and fragrances. The multitude of often small, specialist product-flows are what necessitate a generally acceptable medium of exchange, to balance the transactions.

The focal areas where such systems emerge—the ‘nuclear’ areas of early civilizations—are typically geographically unusual areas of complex ecology, where complementary exchanges between contrasting ecological zones can easily occur. These are often parts of the same regions which were nuclear for the origins of farming, which can be seen as an exchange of the crops themselves, moving them from natural habitats to a wider distribution; the second stage of exploiting such ecological complementarity included in addition the systematic exchange of specialist products (like oil and wine) rather than just the organisms themselves. The development of economic core regions sets the context of production in an ever-enlarging hinterland, where characteristic patterns of zonation develop. Unlike the highly developed macro-von Thünen rings of the advanced world system, however, the earlier phases of such a zonally differentiated structure were characterized by rather loose articulation between the nuclear core (with its peripheral sustaining area) and its outer supply zone—often reached by periodic expeditions like those of Solomon and earlier rulers like Hatshepsut and Tuthmosis III (see p. 30). The formation of early states was often accompanied, therefore, by the development of semi-independent opportunist mobile populations, either on land or sea, who simultaneously exploited specialist ecological niches, and occupied an articulating role in the economy (which later on was taken over by specialist merchants). These were typically pastoralists and sea peoples (Artzy 1994). It was the increasing flow of organic commodities which made possible such regional specialization, and bulkier products

were increasingly commoditized as the system grew in scale and transport capacity (especially by sea) increased. Increasing capitalization makes possible ranching and the plantation of tree-crops. At the same time the need for highly specific ingredients means that routes for rare materials can open up over long distances, and may be supplied from very different socio-economic settings—like the camphor gathered by south-east Asian rainforest tribes for the Chinese. As the system expands, so the ‘zones’ are experienced successively by any particular location as a series of ‘phases’ of development (which may give the impression of an endogenous evolutionary sequence); but as the system increases in scale there are also qualitative transformations, so experiences are not merely replicated but can be seen as new types of phenomena, particularly in the degree of area-specialization and the facilities required for their integration. The nature of animal and plant exploitation, including the balance between staples and non-staples, and between primary and secondary products (whether live or terminal), is increasingly determined by position in such a system.

SPATIAL OPPORTUNITY AND LOCATIONAL ADVANTAGE

This growing complexity of exchanges, usually channelled through nodal points on transport networks, offers opportunities for the system to be manipulated for individual or sectional advantage. Zonal centrality thus corresponds to network complexity. The spread of new cultigens (first the products, then the crops themselves, in a series of episodes of import-substitution) leads to novel forms of consumption practice, values, and patterns of social emulation. Access to exotic goods and consumables is a well-known way of constructing power. In these negotiated transactions, particular social actors or groups stand to gain a competitive advantage, particularly where they can control the flow of goods and more particularly the processes of adding value by creating more complex products with special social meanings through their association with rituals and festivities. (Perfumed oil for anointing would be a classical example; or special foods imbued with mythical significance.) It is by these mechanisms that social differentiation and incipient economic stratification begins to occur. Nascent elites, however, have a common interest in restricting exotic materials so that supplies remain within their control; and for this reason patterns of local specialization may appear, which preserve the ‘exotic’ character of the goods and delay or prevent the process of ‘import substitution’. This may be a fast-moving game, for it reflects patterns of competition both within and between communities. These possibilities of diverting and monopolizing flows are naturally greater in proportion to the volume (and value) of the flows. The possibility of riverine or maritime transport (whose costs are about one-tenth of those over land) greatly enhances the conditions for developing such a pattern. In particular, they open up possibilities for the exploitation of middlemen positions—areas whose locational advantage lies not in terms of immediate natural resources such as soils or minerals, but in terms of their structural position within a differentiating system. These factors are particularly powerful in primitive transport conditions with a high friction of distance, where route choices may be highly constrained; and it is at choke points,

convergence nodes and trans-shipment (break-of-bulk) points along these routes that spectacular accumulations of wealth may occur.

Although these points are often made in connection with the growth of urban economies, they are equally true of much smaller-scale trading systems like those of coastal Melanesia. Here, advantageously placed islands—often without outstanding natural resources of their own—may come to specialize in middleman trading, and come to cultivate ‘cash-crops’ for which they have a steady market, such as tree-crop products. The classic example are the Siassi of the Vitiaz Strait, between the Huon peninsula of New Guinea and the island of New Britain (Harding 1967; Brookfield and Hart 1971:328–32). The inhabitants of the Siassi islands exploit their nodal position in the network to specialize in middleman trading, at a considerable profit. A series of transactions with different partners might yield the following sequence: 12 coconuts→3 pots→1 pig→10 sago packets→100 pots→10 pigs (Harding 1967:139). The Siassi exploit their superior knowledge (and exchange-partners’ ignorance) by outrageous advertising claims: pots, for instance, are described—to the inhabitants of non-pottery-producing areas—as the shells of deep-water molluscs, obtained by dangerously deep dives! (Herodotus’ description of the gold-guarding ants of Bactria suggests a similar hype.) The Siassi also grow coconuts, in which they possess a near monopoly; and it is notable that they deliberately break the exported coconuts to prevent their being grown elsewhere.

Another property exemplified by trading networks of this kind is the principle of intervening opportunity. In the Melanesian example mentioned above, some locations specialize in the manufacture of pots, using the flow of other products to subsidize added-value production from relatively cheap raw materials, which ‘piggyback’ on the movements of other goods. Specialization is thus made possible by an advantageous position on routes of inter-regional contact. A similar situation explains the growth of wool production in the English Cotswolds in the Late Iron Age, since the area of the Jurassic limestone ridge west of Oxford is the crossing-point from the Severn catchment to the Thames catchment, and saw an increase in traffic past the developing *oppida* of Minchinhampton, Bagendon, Salmonsbury, and Oxfordshire Grim’s Ditch, where surplus wool was profitable (Sherratt 1996b). The area has been famous for its wool-production ever since (and two hundred years ago made the blankets which the Hudson Bay Company exchanged for furs, in a classic core export of manufactures for peripheral high-value raw materials). This area has no inherent environmental advantages as grazing country by comparison with many other areas (for instance other parts of the Jurassic scarp). It is the combination of suitable environmental conditions with an assured outlet for its products that has produced the emphasis on wool-production—like much of Mediterranean transhumant pastoralism. The element of production for exchange tends to be ignored in prehistory, because of the pervasive belief in purely ‘subsistence’ production, locally consumed; but an advantageous location in relation to flows of trade would have been an important factor in determining the crops grown and livestock kept.

How, therefore, are more complex systems generated? It is relatively easy to see how a large-scale world system works, and why it should expand; but how do such structures begin? In particular, how do nuclear patterns build up sufficient internal differentiation

before the onset of urbanization? It is here that regional diversity exercises a critical influence on the genesis of complex social systems—and the stress on human motivations must be complemented by a consciousness of the possibilities provided by the environment.

THE DEVELOPMENT OF SECONDARY FARMING IN SOUTH-WEST ASIA

The differentiation of farming systems in the nuclear region of the western Old World (Sherratt 1996a) offers a well-studied example, which may provide a paradigm for other areas which have given rise to similar structures (Figure 1.1). The initial (PPN) phase of farming, in the ninth and eighth millennia cal. BC, was a limited form of simple groundwater-dependent cultivation to which the keeping of domestic livestock (principally sheep and goat) was slowly added. After a phase of restructuring in the Levant around 7000 cal. BC, a rapid extension out of the Near East, both to Europe across the Iranian Plateau, took place in the early seventh millennium, associated with the domestication both of cattle and free-threshing species of wheat; while by the later seventh and sixth millennia there is evidence from Greater Mesopotamia for small-scale irrigation and indications that cattle traction may have been used for ploughing. For these three or four millennia, the initial crop complex—essentially providing carbohydrate-rich cereals and protein-rich legumes—remained dominant; variety was perhaps supplied by locally gathered oil-bearing plants (since many later specialized crop-plants—the ‘variety crops’—must have replaced small indigenous sources of these types of food). From the sixth millennium onwards it was variety crops rather than the staple crops which were added to the suite of cultigens and domesticates; and many of them were perennials such as tree-crops, propagated vegetatively to fix desirable strains (Zohary and Hopf 1993).

It is this process which needs to be seen in terms of the phenomena discussed in earlier sections, and particularly in terms of dietary diversification. The development of storable and transportable commodities was thus an important element of the growth of exchange: and especially products with high value and low bulk, which could nevertheless be produced in quantity at certain locations—oil-rich or sugar-rich species; aromatics or plants with a distinctive taste; fibre-plants and dyes. Many of these products could be combined, to create further consumable commodities. Such a description calls to mind the complex maritime trade of the Bronze Age; at the beginning of this process, in the Chalcolithic, distances were smaller and formulae simpler—but the principle was the same. The incentive to expand milk production, by keeping larger numbers of mature female sheep, was no doubt due in part to the fact that nutritious and relatively long-lasting cheeses could be produced, which would form useful items of exchange with neighbouring communities in environments slightly less advantageous for raising

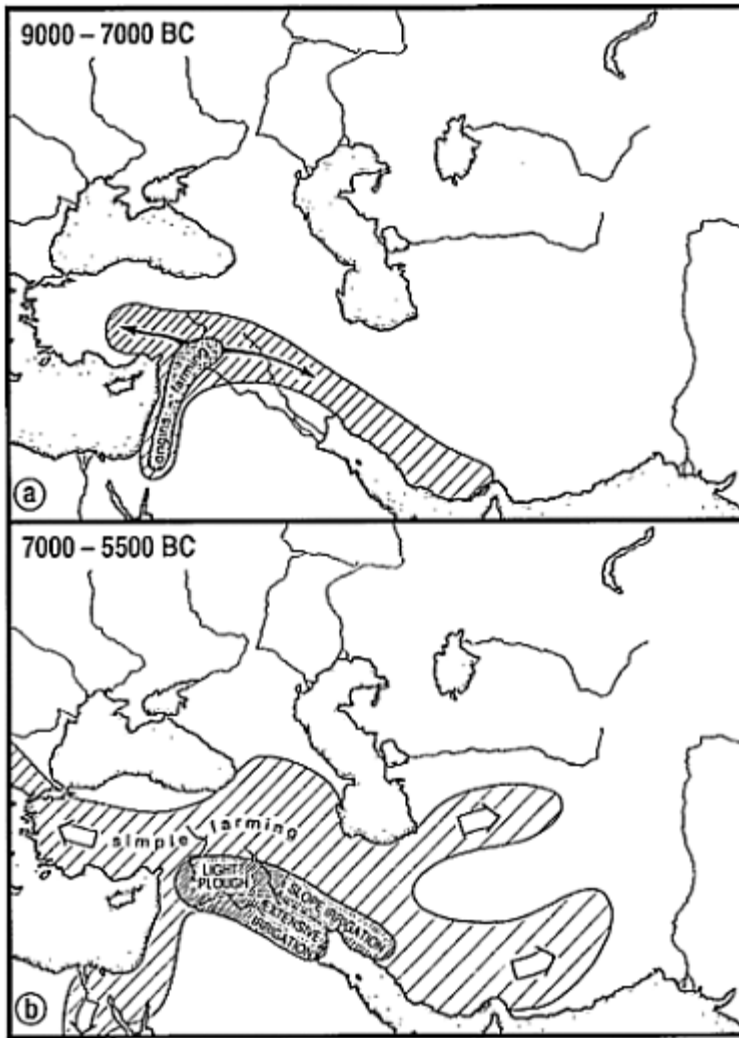
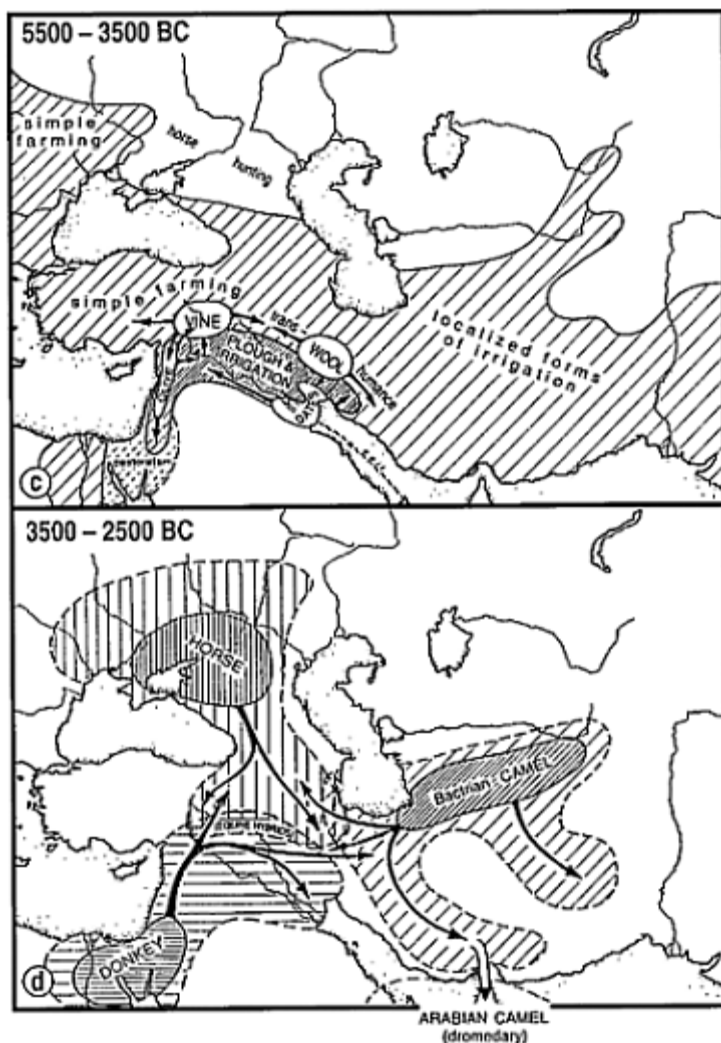


Figure 1.1 The nuclear region of the Fertile Crescent (south-west Asia), showing the spread of simple farming (horticulture) in the Neolithic (9000–7000 cal. BC) and the subsequent emergence of secondary farming (agriculture and arboriculture) in the Chalcolithic (7000–3500 cal. BC), culminating in the domestication of specialized transport-animals in the period of urbanization (3500–2500 cal. BC). Note that simple farming continued to spread during the time in which more advanced forms were emerging in the nuclear area (Sherratt 1997).



animals. Wool provided a similar though longer-lasting product that could be traded over greater distances, and which could itself be made up into a variety of locally specified artefacts: it thus had the cross-cultural advantage of prime value, like metals (Renfrew 1986). Moreover the wool-bearing breeds of sheep would be an item of trade in themselves: to some extent 'hoarded' as 'trade secrets'—like the Siassi with their coconuts, since exchanging viable organisms would be the equivalent of giving away capital—but potentially available to seal a particularly valuable trading partnership. These considerations form the fine detail of the process of crop dispersal.

So also did the kinds of food produced. New ingredients and supplies must have had

their effects on cuisine. Fruit crops, in particular, brought their own fungi, such as the yeasts; and new forms of what might be called micro-domesticates developed: genera such as *Saccharomyces*, probably transferred from fruits to sprouting (malted) cereals, to make beer and leavened bread; just as the bacterium *Lactobacillus* was tamed to make cheese and yoghurt (Englund 1995; Stol 1993; Teuber 1995). Transfers of techniques between crop complexes thus enhanced the range of products. These products made their parent cultigens more desirable, but they surely also had meanings for particular social groups (like tea for middle-class Europe), and provided cultural content to social differentiation. Alcoholic beverages were particularly important in this respect, helping to create the hard-drinking, landowning elite against which a tea-drinking bourgeoisie would make its cultural protest some 5,000 years later (Smith 1995).

The variety of crops (olive and date) evidenced at Nahal Mishmar on the edge of the Dead Sea by 4000 BC (Bar-Adon 1980) indicates that a lively series of exchanges around the edges of the Fertile Crescent had already taken place. It is possible to postulate separate areas of origin for the various elements of this secondary farming complex. Each of them appears to have been situated just beyond the inner arc of the Crescent where agrarian expansion in Greater Mesopotamia was most marked in the seventh and sixth millennia (Figure 1.2). They thus appear as 'variety crops' around the zone most suitable for producing carbohydrate staples. In the north, a variety of forms of evidence situate the domestication of the vine (and perhaps pomegranate) in eastern Anatolia, in the Mediterranean hill-country perhaps along the upper courses of the Euphrates and Tigris. On the evidence of tartaric acid in residues, McGovern *et al.* (1996) has identified grape-wine—not only from mid-fourth-millennium Godin Tepe in Kermanshah but even from sixth-millennium Hajji Firuz Tepe near Lake Rezaieyeh. Other tree-crops such as olive, fig and almond seem to have their origins further to the south-west, in the Mediterranean hill-country of the Levant. On the other hand, the date-palm was abundant in palm-groves at the head of the Persian Gulf, and is likely first to have been extensively utilized there; date-stones were recovered from the Ubaid (fifth millennium) levels at Eridu, in southern Iraq. Sheep are native to Iran, and the earliest evidence for a wool-bearing variety comes from Kermanshah, which would conform to this model of areas linked to the network of contacts that constitutes the Fertile Crescent. These elements were exchanged and diffused, in appropriate niches, around the area of Greater Mesopotamia during the fifth millennium. The close cultural and economic articulation of all these areas is indicated by the spread of the late Ubaid culture around northern Mesopotamia as well as its southern part, and the chain of influences through the Levantine Chalcolithic cultures down to Egypt. This created a sphere of common interests and modes of consumption (not least of alcoholic drinks), within which a degree of regional specialization and inter-regional trade began to optimize productivity on a Ricardian (comparative advantage) model. Linking northern and southern parts of this sphere, the Euphrates in particular became a

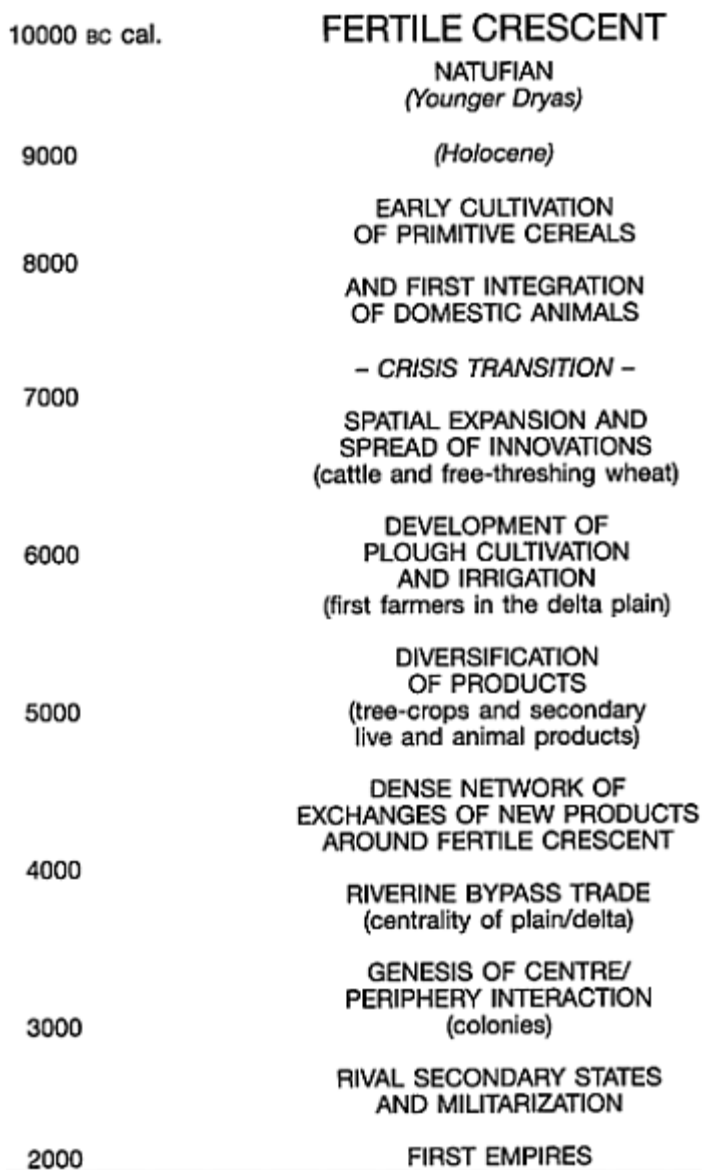


Figure 1.2 Chronological diagram of the succession of agrarian regimes (and their political consequences) in the nuclear area of the western Old World in the earlier Holocene, c. 9000–2500 cal. BC (Sherratt 1997).

great highway which brought middleman opportunities to the Sumerians—the super-Siassi of Mesopotamia. Like the medieval Low Countries at the mouth of the Rhine, the

logical response was the development of a woollen textile industry, adding value to the product; and it was on this basis, around the temple-centres with their flocks, herds and dependent labour, that the economic basis of Mesopotamian civilization was created.

It was the growing emphasis on storable and tradable secondary live products which characterized the agro-pastoral systems of this increasingly nuclear area. Even if some aspects of this development represented an 'adaptation' to an increasing range of environments, from coastal swamps to desert margins, it was to an equal if not greater extent 'auto-adaptive', in that the whole range of innovations were complementary and mutually adjusted through exchange. It is in this sense that the diversifying range of cultigens can be considered as cash-crops, and analysed from an economic as well as an ecological point of view. In this analysis, the products of cultivation differ in no fundamental respect from other forms of material culture. The development of techniques of processing and refinement, mixing and manufacture into commodities is precisely parallel to contemporary developments in metallurgy, from smelting to alloying and complex casting. These are not separate processes, but rather aspects of the same long-term trend towards the elaboration of material culture and more complex patterns of its social circulation.

THE SPREAD OF CROPS: 'DISPERSAL' OR 'TRADE'?

A growing complexity of diet and cuisine, in parallel to the evolution of more complex social and technological structures, is a continuing feature of cultural development. Archaeological textbooks sometimes give the impression that 'farming' had its 'origins' and then 'spread', after which nothing much happened except 'intensification'. In fact the farming systems of the world were in continuous flux, constantly absorbing new cultigens from their neighbours, and at the same time accommodating them socially and culturally in the complex ways hinted at above. Individual regions and their civilizations were not isolated, but interacted on an increasing scale—of which the 'globalization' of the world economy, so much discussed today, is but the final episode. These interactions have led to the dispersal of certain crops on a continental and intercontinental scale. Such exchanges between regional crop complexes form important episodes in world history. The most spectacular was, of course, the post-Columbian exchange of New and Old World crops which took place from AD 1500 onwards, and involved a whole spectrum of important and useful plants, from tobacco to the potato—to cite only two New World members of a single family, the Solanaceae. This has been chronicled, *inter alia*, by Alfred Crosby (1972), who has also considered the expansion of European crops, weeds, and especially livestock—with which the New World was relatively underendowed—in his 1986 book. This latter work has been criticized, however, for its failure to situate the biological process within a framework of economic and cultural imperialism, including the global specialization in production which came to characterize the modern world-system (Wallerstein 1974). Simple models of diffusion, or the ecological concept of colonization, are an inadequate tool to deal with the complexities of the historical process; and a more sophisticated approach is discussed below.

Some idea of the range of edible species which has dispersed in this way is provided by the *Oxford Book of Food Plants* (Harrison *et al.* 1969), which gives a compendium of species currently used for eating—whether by elites or mass consumers—across the world. Only about a fifth of these species could be considered calorific staples: the rest might collectively be termed ‘variety crops’. (The statistic is rather artificial, in counting only the numbers of species, but it is worth defining more precisely: taking ‘staples’ to include grains, legumes and major root-crops, and ‘non-staples’ as fruits, herbs and leaf-vegetables, Harrison *et al.* (1969) lists *c.* seventy species or important varieties of the former, and *c.* 350 of the latter. A mere handful of calorie-rich species account for the great bulk of the world’s production; the rationale of the rest is precisely in their diversity and variety—and these non-staple crops well deserve the name of ‘variety crops’.) To this should be added not only the species which have now fallen from use (e.g., through replacement by more attractive—or commodified—equivalents), but also the great range of plants exploited for their non-food products, and together these provide the materials for a continuing process of exchange which has been going on without cessation since the inception of farming.

The ‘Columbian exchange’ was only the latest and best known of the inter-continental encounters, such as those between the western and eastern Old World (along the Silk Route), or between India and Africa (across the Indian Ocean). These clearly defined exchanges between biogeographic zones, however, are themselves only the most obvious of the subtle network of exchanges between regional centres of farming, and between secondary foci of domestication, which have accompanied the encounters of civilizations. Partly because of the association of the early Old World cereals with a demographic ‘wave of advance’, the spread of crops is curiously one of the few remaining fields in which migrationism is consistently invoked by prehistorians (e.g., Renfrew 1987), perhaps in the effort to avoid the reductionism of ‘diffusion’; but both deserve a more sophisticated alternative. The spread of new crops, and of newly domesticated forms of livestock, is a *social* process: that is to say, part of the sphere of competition, emulation, negotiation, performance and communication like the rest of material culture usage. Simply because its products are consumable in the literal sense should not exclude them from the field of the anthropology of consumption!

One book which offers a model for the historical analysis of such a cultural transformation in which crops and livestock have played a prominent (but not exclusive) part is Andrew Watson’s *Agricultural Innovation in the Islamic World: the diffusion of crops and farming techniques 700–1100* (1983). In longer perspective, the process described by Watson is a further phase of that *orientalización* of the western Mediterranean that had begun with the Phoenicians (who introduced the donkey and the olive—two features which had made their appearance in the Early Bronze Age of the eastern Mediterranean), and continued to some extent under the Romans. It was these elements, reinforcing earlier arrivals such as wool-bearing breeds of sheep, which *created* the Mediterranean environment and vegetation as we know it today (Huntley and Birks 1983). Rice and sugar-cane were Islamic introductions in Spain, as well as citrus fruits and cotton, marking the arrival of South Asian species in western Europe; and with them came new techniques of irrigation, including the water-wheel. (Watson also discusses

sorghum, banana, coconut, watermelon, spinach, artichoke, colocasia, eggplant and mango.) This was the most important movement of crops before the Columbian exchange; and, indeed, the spread of sugar-cane to Spain made possible its export and establishment across the Atlantic as a major high-value commodity-producing crop in the colonial world of the early modern period.

This 'diffusion', however was not simply a continuous and inexorable spread, but rather an episodic process which usually happened rapidly, when many of the right conditions coincided, or not at all. Among the relevant factors were trade and prosperity, the regular use of certain routes, political and cultural compatibility, the fostering of demand, and the leading role of certain rulers in initiating transfers. That such factors were not novel ones is indicated by Egyptian 18th Dynasty records of Hatshepsut's expedition to Punt, or Tuthmosis III's conquests in the Levant, both of which resulted in the importation of foreign species, to be grown under royal patronage in Egypt (Manniche 1989). Islamic rulers were equally proud of their propagation of new species—some of which simply proclaimed the prestige of the exotic, though others were important as medicinal or spice plants, and some ultimately became widely grown food- or fibre-crops. Changed habits in diet and dress were sometimes necessary before they became widespread; though some introductions were simply locally grown substitutes for materials imported as luxuries (like sugar). Some of the imported species fitted the climate of the southern shore of the Mediterranean better than the existing suite of plants derived from a winter-rainfall complex: rice, cotton, sugar-cane, colocasia, eggplant, watermelon and sorghum were irrigated summer crops, and like Indian *kharif* crops (as opposed to winter-grown *rabi* crops, such as the wheats) formed complementary seasonal products. The agricultural 'revolution' was bound up with demographic changes and the settlement of new areas, often pushing far into the desert (where contacts could be maintained by camel), as well as with the process of urbanization. (This situation might be seen as a scaled-up version of the kind of agriculture typical of lowland western Asia since the fourth millennium, combining tree-crops, notably date-palms, with pastoralism, using camels instead of donkeys.) New products from introduced crops were often traded over long distances, now usually through the intermediacy of a merchant class. These factors show how farming innovation was embedded in a pattern of social, cultural and economic change. Watson refuses to separate agrarian history from general history: 'what one glimpses...is an agricultural sector developing within an economy which was also developing, each acting on the other to determine the overall pattern of growth' (1983:134). (Similar remarks would apply to the 'Ipomoean Revolution' in highland New Guinea, where the incentive to introduce the sweet potato was partly to sustain pig-feasting.)

Mediterranean sophistication—supported by a maritime trade that articulated with overland desert routes linking to the monsoon routes of the Indian Ocean—was slower to penetrate into temperate Europe beyond the Alps. It was only in the fourteenth century that the courts of Christian Europe began to develop a sophisticated, spice-based cuisine (Sherratt 1995:14, and references therein), and during the sixteenth century there was a rapid development of tableware and serving equipment appropriate to the density of messages encapsulated in the now highly elaborate meals of the aristocracy and their

bourgeois imitators. As the competitive display of this rising class came to challenge the aristocracy's monopoly of conspicuous consumption, so the older-established elite replied by emphasizing access to game and the subtlety of flavouring achieved by an expert *chef-de-cuisine*. Such manoeuvrings correspond well to the strategies and counter-strategies of social emulation described for instance by Miller (1982) as characteristic of the human uses of material culture; and food and food-crops are no exception to such generalizations. Just as the equipment of elite consumption practices (precious metal vessels) was imitated in less expensive media (Greek painted pottery or 'vases') by a broadening class of consumers in fifth-century BC Athens (Vickers and Gill 1994), so in our own times we have seen dogfish come to be described as 'rock-salmon', and served to the masses as if it were fresh from a Scottish salmon stream; or fizzy fermented pear-juice sold as 'Babycham', with the implication that it has some relationship to champagne. Here, then, lies an important dynamic of agrarian change: the desire of rising social groups for symbols of distinction, and consumption rituals (like the eighteenth-century middle-class tea ceremony) appropriate to their new-found class and station. Such is the fine detail of the process which on the map is represented by the successive isochrons of 'dispersal'.

CONCLUSION

This chapter has argued against the dualism that pervades archaeological analysis: the desire to set up oppositions between 'subsistence' and 'trade', and between 'ancient' (or 'prehistoric') and 'modern'. These lead to false dichotomies. The past was different from the present in many ways, not least in scale; but not so fundamentally that human motivations do not provide a thread of continuity.

I have therefore attempted to shift the subject-matter of 'subsistence' from the realm of the calculable determinism of economics into the interpretative domain of culture. This does not, however, demand a retreat into relativism and the assertion of cultural uniqueness. Food behaviours (and other forms of consumption) are not so environmentally or economically determined as to be fully predictable, but not so arbitrary as to preclude useful comparison. Values are socially constructed, but they are constructed for similar purposes in different cultures. There is no abstract, measurable quality called 'value'; but the desire to possess (and thus to mobilize goods for exchange) follows certain characteristic human propensities. 'Added value' is always the impression of meaning as well as simply the manufacture of a commodity: it carries an imprinted message (however much that message can be reinterpreted by its ultimate recipients). Even such dissimilar commodities as woollen textiles and wine have comparable properties in this respect. Wool made possible the manufacture of more plentiful and more elaborate textiles (Barber 1991; Winiger 1995). Textiles are intimately connected with the presentation of the body in everyday life, and thus with the creation and transmission of social meanings (Gittinger 1985; Weiner and Schneider 1989); hence also with concepts of civility and systems of social control. Roche (1994:506) has talked of the 'production and commercialisation of appearances'. It is no coincidence that foreign

missionaries tell the natives they are naked, and foreign merchants then sell them clothes: the ideological and the practical are two aspects of the same concept of 'civilization' and the *mission civilatrice*. It is not surprising, therefore, that an expansion of sheep-rearing has accompanied the spread of urban civilization in the Old World. Alcohol, too, is intimately connected with the sense of civilized identity which characterizes the region of central Eurasia extending from the Mediterranean to the Far East. This is not a simple addiction (though this element is undoubtedly present), but is testimony to the power of wine in particular to convey a subtle spectrum of meanings (both sacred and secular) concerning physical and spiritual well-being and social worthiness (Sherratt 1995). Similar observations could be made for olive-oil in relation to anointment, purification, body odour and social acceptability. Both wool-sheep and tree-crops have sustained social relations in this way since the Chalcolithic. Although they manifest them in a particularly powerful way, these properties are not confined to the consumables of civilizations; they are an aspect of all forms of consumption, whether in everyday cuisine or more particularly in rarer forms of ceremony and feasting.

Recognition of this fact does not imply neglect of the limits set by calories and bioenergetics, still less a denigration of the work of archaeologists who work with questions of sustenance and agrarian intensification. But there is a continuing tendency in the archaeological literature to cede responsibility to 'subsistence change' (even if no longer so explicitly to demographic pressure) as the principal motor of change in human societies. The perspective offered here would deny that population growth (or even agrarian improvement) is an independent variable; instead it would assert that societies grow and thrive as they successfully interact with their neighbours, and not least in the mutual provision of consumable commodities.

REFERENCES

- Artzy, M. 1994. Incense, camels and collared rim jars: desert trade routes and maritime outlets in the second millennium. *Oxford Journal of Archaeology* 13, 121–47.
- Barber, E.J.W. 1991. *Prehistoric Textiles: the development of cloth in the Neolithic and Bronze Ages*. New Jersey: Princeton University Press.
- Bar-Adon, P. 1980. *The Cave of the Treasure: the finds from the caves in Nahal Mishmar*. Jerusalem: Israel Excavation Society.
- Brookfield, H.C. and D.Hart, 1971. *Melanesia: a geographical interpretation of an island world*. London: Methuen.
- Clark, J.G.D. 1952. *Prehistoric Europe: the economic basis*. London: Methuen.
- Crosby, A. 1972. *The Columbian Exchange: biological and cultural consequences of 1492*. Westport, Conn.: Greenwood Press.
- Crosby, A.W. 1986. *Ecological Imperialism: the biological expansion of Europe, 900–1900*. Cambridge: Cambridge University Press.
- Dickson, J.H. 1978. Bronze Age mead. *Antiquity* 52, 108–13.
- Englund, R.K. 1995. Late Uruk period cattle and dairy products: evidence from proto-cuneiform sources. *Bulletin on Sumerian Agriculture* 8, 35–50.

- Gittinger, M. 1985. *Splendid Symbols: textiles and tradition in Indonesia* . Oxford: Oxford University Press.
- Harding, T.G. 1967. *Voyagers of the Vitiaz Strait* . Seattle: University of Washington Press.
- Harrison, S.G., G.B.Masefield, and M. Wallis (with B.E. Nicholson, illustrator) 1969. *The Oxford Book of Food Plants* . Oxford: Oxford University Press.
- Huntley, B. and H.J.B.Birks, 1983. *An Atlas of Past and Present Pollen Maps for Europe 0–13,000 years ago* . Cambridge: Cambridge University Press.
- Kislev, M.E. and O.Bar-Yosef. 1988. The legumes: earliest domesticated plants in the Near East? *Current Anthropology* 29, 175–8.
- Levy, T. 1992. Transhumance, subsistence, and social evolution in the northern Negev desert. In *Pastoralism in the Levant: archaeological materials in anthropological perspective* , O.Bar-Yosef and A.Khazanov (eds), pp. 65–82. Madison, Wis.: Prehistory Press.
- McGovern, P.E., D.L.Ginsker, L.J.Exner and M.M.Voigt. 1996. Neolithic resinated wine. *Nature* 381, 480–1.
- Manniche, L. 1989. *An Ancient Egyptian Herbal* . London: British Museum Press.
- Miller, D. 1982. Artefacts as products of human categorisation. In *Symbolic and Structural Archaeology* , I.Hodder (ed.), 17–25. Cambridge: Cambridge University Press.
- Needham, S. and J.Evans. 1987. Honey and dripping: neolithic food residues from Runnymede Bridge, *Oxford Journal of Archaeology* 6, 21–8.
- Nitz, H.-J. 1993. Introduction. In *The Early-Modern World-System in Geographical Perspective* , H.-J.Nitz (ed.), 1–25. Stuttgart: Franz Steiner Verlag.
- Renfrew, A.C. 1986. Varna and the emergence of wealth in prehistoric Europe. In *The Social Life of Things: commodities in cultural perspective* , A.Appadurai (ed.), 141–68. Cambridge: Cambridge University Press.
- Renfrew, A.C. 1987. *Archaeology and Language: the puzzle of Indo-European origins* , London: Cape.
- Roche, D. 1994. *The Culture of Clothing: dress and fashion in the ancien regime*. Cambridge: Cambridge University Press.
- Runnels, C. and Tj.H.van Andel. 1988. Trade and the origins of agriculture in the eastern Mediterranean. *Journal of Mediterranean Archaeology* 1, 83–109.
- Schmitt, L. 1994. The Hensbacka: a subsistence strategy of continental hunter-gatherers, or an adaptation at the Pleistocene—Holocene boundary? *Oxford Journal of Archaeology* 13, 245–64.
- Sherratt, A.G. 1995. Alcohol and its alternatives: symbol and substance in early Old World cultures. In *Consuming Habits: drugs in history and anthropology* , J.Goodman, P. Lovejoy and A.Sherratt (eds.) 11–46 London: Routledge.
- Sherratt, A.G. 1996a. Plate tectonics and imaginary prehistories; structure and contingency in agricultural origins. In *Origins and Spread of Agriculture* , D.R.Harris (ed.), 130–40. London: UCL Press.
- Sherratt, A.G. 1996b. Why Wessex? The Avon route and river transport in later prehistoric Britain. *Oxford Journal of Archaeology* 15, 211–34.

- Sherratt, A.G. 1997. *Economy and Society in Prehistoric Europe: changing perspectives*. Edinburgh: Edinburgh University Press.
- Smith, W.D. 1995. From coffeehouse to parlour: the consumption of coffee, tea and sugar in north-western Europe in the 17th and 18th centuries. In *Consuming Habits: drugs in history and anthropology*, J.Goodman, P.Lovejoy and A.Sherratt (eds), 148–64. London: Routledge.
- Stol, M. 1993. Milk, butter and cheese. *Bulletin on Sumerian Agriculture* 7, 99–113.
- Teuber, M. 1995. How can modern food technology help to identify dairy products mentioned in Sumerian texts? *Bulletin on Sumerian Agriculture* 8, 23–31.
- Vickers, M. and D.Gill. 1994. *Artful Crafts: ancient Greek silverware and pottery*. Oxford: Clarendon Press.
- Wallerstein, I. 1974. *The Modern World-System: capitalist agriculture and the origins of the world-economy in the 16th century*. New York: Academic Press.
- Wallerstein, I. 1989. *The Modern World-System: the second great expansion of the capitalist world-economy*, 1730–1840, New York: Academic Press.
- Watson, A. 1983. *Agricultural Innovation in the early Islamic World: the diffusion of crops and farming techniques, 700–1100*. Cambridge: Cambridge University Press.
- Weiner, A. and J.Schneider (eds). 1989. *Cloth and Human Experience*. Washington, DC: Smithsonian Institution Press.
- Winiger, J. 1995. Die Bekleidung des Eismannes und die Anfänge der Weberei nördlich der Alpen. In *Der Mann im Eis: neue Funde und Ergebnisse* (The Man in the Ice, 2), K.Spindler, E.Rastbichler-Zissernig, H.Wilfing, D.zur Nedden and H.Nothdurfter (eds), 199–87. Vienna: Springer-Verlag.
- Zohary, D. and M.Hopf. 1993. *Domestication of Plants in the Old World: the origin and spread of cultivated plants in West Asia, Europe and the Nile Valley*. Oxford: Clarendon Press.
- Zvelebil, M. 1996. The agricultural frontier and the transition to farming in the circum-Baltic region. In *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, D.R.Harris (ed.), 323–45. London: UCL Press.

Cultural implications of crop introductions in Andean prehistory

CHRISTINE A. HASTORF

INTRODUCTION

Plants participate in political processes at many levels: civic, ceremonial, ritual, as well as daily practice, creating and recreating the world that people perceive and live in through the meals that are prepared and eaten, the tools that are produced and used, the kin groups that exist across the landscape. Through plant patterns in the archaeological record, archaeologists can identify cultural activities. In this chapter, I shall look at the onset of agriculture and the entrance of crop use seen archaeologically along the west coast of Peru with a focus on the tempo of uptake of foreign crops. With that evidence, I shall explore what plant use might illustrate about the social dynamics in these early sedentary groups. I will use the example of Peruvian coastal plant data, spanning the time of the first plants up to the evidence for the political developments of the Early Horizon. The dates and traditional phase names span the Preceramic and the Initial Phases:

- Preceramic Phase III (8000–6000 BC);
- Preceramic Phase IV (6000–4200 BC);
- Preceramic Phase V (4200–2500 BC);
- Preceramic Phase VI (2500–2100 BC)—Cotton Preceramic;
- Initial Period (2100–1400 BC).¹

The greater Andean region of South America is considered one of the centres of pre-modern civilization. This area includes modern Ecuador, Peru, Bolivia, northern Chile and north-west Argentina. It lies along the main spine of the South American continental mountain range. It is notable for its diverse environmental zones that can be very close together. The area this study focuses on is the Peruvian coast, along hundreds of kilometres of very dry coastline. Many scholars describe this long time-span there, like the Neolithic in Europe, as a unified, homogeneous cultural and economic trajectory. But, looking at this time-span from another angle, I think we can see diversity in this sequence that illustrates the growth and maintenance of cultural identities as well as the values of the plants that were farmed.

My question is not why did intensive agriculture take so long to develop on the coast of Peru, which it did, but what can the introductions of the crops and their distributions during this long time period illustrate about the political and cultural processes that were

occurring? Here I shall view the creation of cultural difference through food and its preparation and to investigate what meanings might have accompanied such a process. By moving on from the well-discussed models of population pressure and climatic constraints of the coast, I think we can see a dynamic of cultural difference along the coast in the preceramic phases between 8000–1400 BC that only minimally relates to environmental differences (Lanning 1967). Many ideas have been put forward for why agriculture began and why it spread. While most models hold a grain of truth, none satisfy the archaeological community with an explanation. I think we can gain further understanding about this transition by looking at the differences in these changes more closely.

Marek Zvelebil, in his edited volume on the transition to farming in Eurasia, presents a series of models for agrarian onset with an eye towards geographical and temporal differences. In the concluding chapter he makes a case that this innovation occurs for different reasons in different settings. He lists a series of traditional causes for taking up agriculture in different geographical settings. These include filling gaps in the local resources (Lewthwaite 1986), contact with farmers (Zvelebil 1986), a decline in resources through climate change, environmental stress or population pressure and thus the need for increased calorific output (Cohen 1978, 1981), social competition (Bender 1978, 1985; Hayden 1990), and colonization (Ammerman and Cavalli-Sforza 1984). This last model for the uptake of agriculture outside of a plant (or animal) domestication core suggests that when a set of crops were adopted, they were accompanied by new technologies, paraphernalia, and people. Zvelebil (1986) notes that when crops arrived as a package, people were probably moving into the region, bringing along their own cultural traits and subsistence strategies. While this should be the most easily visible model in the archaeological record, it does not have supporting evidence along the coast of Peru.

The other above-mentioned models are well known and have been suggested for the Peruvian onset of agriculture, therefore I will not elaborate on these models here. I claim that these models do not provide us with the closest explanations for the onset and spread of agriculture. I would like to re-focus our view of this transition by taking a slightly different look at the agricultural evidence to see if we cannot get closer to the changes during the preceramic years, setting the stage for the later, rich, and elaborate Andean political (pre) histories.

SOME MODELS

The traditional economic models of agricultural origins do not fit most individual examples, their scales are not correct. This challenges us to seek out new perspectives about domestication, directing us to look at the smaller events in food use. Perhaps these events are more tied to inter-community relations, settlement configuration, marriage patterns and exchange (Goody 1982), harvesting shifts (Hillman and Davies 1990; Bohrer 1991), as well as the definition of the people's ethnicities through daily practice.

What were the first domesticates and what might have been their value to the people

tending them? A traditional model for Peruvian agriculture is that people were hungry so they focused on producing high carbohydrate foods to ease resource pressure and feed their growing population (Cohen 1978; Wilson 1981). Food shortage could have been brought about by many causes, including climate change, change in the resource base, or just more people in the area. I find these models particularly dubious for the Peruvian coast. The Peruvian coast is one of the richest marine food resource areas in the world (Moseley 1975; Quilter and Stocker 1983). Models for the onset of agriculture also include the impact of the periodic torrential storms (El Niño) and the need for storage along the Peruvian coast (Osborne 1977). This storm model is curious because periodic storms, which occur in many places of the world, have not been used as a model for agricultural origins in other regions.

Of the two main classes of foragers who adopt agriculture world-wide, one is mobile with small groups following clustered, patchy resources, the other is more sedentary with larger communities and steady, local resources. Zvelebil (1986) suggests that farming was more likely to be taken up by mobile foragers first, while more sedentary and complex foragers would accept it more slowly and for different reasons. Sedentary coastal foragers with good marine and littoral resources, like Peru, at some point in time would have had access to and knowledge about the use of various crops but clearly chose *not* to add their production and tending to their daily activities, nor to change their cuisine and symbolic economy for some time—if ever in some cases.

The *regular* use of domestic crops in the early days of farming, especially among the more sedentary foragers, seems to be more about cultural symbols and kinship relationships than hunger. Farrington and Urry's model for domestication (1985) suggests that the first domesticated plants were herbaceous plants of a tasty, oily or spicy flavour, consumed to diversify meals rather than to bulk them up; exotic (even medicinal) foods added to special family or group meals rather than to ward off starvation. While the authors do not speculate beyond the desirability of this food type, their refreshing model prompts one to ask how and why *specific* plants may have entered into a group's daily practice? Can we suggest that the tasty plants that were taken up also had some special meaning or identity due to their links with places, events, or peoples? I would think that the new foods had to have a (positive) meaning in order to be added into the cuisine.

The Farrington and Urry model is a variation of the idea proposed by Braidwood for grain domestication in the Near East (1953). He suggests that early grain cultivation was due to an interest in beer production; people took the extra time for plant tending to provide a bit of 'spice' in their daily routine with the consumption of fermented beverages and all that might have entailed culturally and socially (Braidwood 1953). The role of fermented beverages and hallucinogens in early agriculture comes and goes in the archaeological literature, but I think they probably played a larger part in initiating new activities than archaeologists give them credit for.

A more politically driven model for the use of domesticates is seen in Barbara Bender's (1978) and Brian Hayden's (1990) ideas that people adopted and cultivated crops because of an increased interest in political activities and exchange. They assume that agricultural produce would provide exchangeable goods, thus making groups regularly operate in a larger network. Gaining items for exchange can be linked to an

increased desire for public display, alliance building and group construction of identity through feasts and food gifts. These political acts would probably be initiated by important families, leaders, or religious persons, keen to introduce plants and encourage the cultivation of crops once they *were* present. Such acts, however, seem to occur after the cultural changes that are initiated with agriculture in changing daily practice. This political stage, involved in the growth of hierarchy and surplus, is a different level of interest and access than the differences being formed in early agriculture.

We see more appropriate small-scale beginnings without overt political pressures (but probably covert social pressures) in the model proposed by Watson and Kennedy (1991). They suggest that women gatherers first initiated the cultivation of plants in North America, through their tending of wild taxa that were of interest to them in their daily rounds of food and medicine gathering. Women thus were the plant nurturers that instigated the morphological and genetic changes that we associate with domestication, not as an economic behaviour, but as nurturers of, and experimenters with, people and plants. This point cannot be overemphasized. Women foragers are constantly collecting and experimenting with plants for nibbling, spicing foods, and medicines. The female Barasana of Colombia, a foraging, swidden farming group, are the collectors of plants. They bring back cuttings, exchange with friends and kin, in a constantly nurturing mode of plant and family raising (Hugh-Jones, pers. comm.). Women also are involved in tending specific taxa that they inherit along their family lines; special family crops that have symbolic meanings linked to the origin myths of their ancestors. These would be carried with women when they moved, planted in each new home, and fed to their families. Their neighbours would recognize that specific variety as that family's plant, with all of its connotations.

Helping us develop a different model of agricultural onset in Peru are the activities from modern Amazonian forager-farmers. Current evidence suggests that small-scale familial inter-regional relationships have wide-ranging catchments, due to exogamous marriage patterns. Through these networks of periodic visits or while on hunting and gathering journeys away from home-base villages, plants are brought back from near and far, not for gain but for curiosity, pleasure and value (Hugh-Jones and Posey, pers. comm.). These plants are planted along local paths and in encircling kitchen gardens and include exotics, medicinal, magical, industrial, mind-altering, and spicy food plants. In this way, plants enter into a people's cuisine because of experimentation, interest, and curiosity. Further, in the Amazon, some plant varieties are community markers. Communities have specific taxa or varieties that are associated with their community identity (Hugh-Jones, pers. comm.). These plants are passed on through the generations to grow and eat, especially at feasts in the process of defining ethnicity. As ethnic markers their neighbours emphasize different plants in their own feasts and myths. Thus these plants move with the people as part of their rituals, renewing their social ties past and present as well as marking their territory.

Such a scenario for plant entry is likely for the Peruvian coast, as most plants were brought in from elsewhere, and thus had to be cared for as special things within the landscape from the start. In fact, the earliest coastal evidence suggests that the plants were grown in a world that was not domesticated nor sedentary. We don't know much

about the pre-agricultural sites, but probably there was movement from the coast seasonally inland with fishing and foraging in the *lomas* cloud forests on the coast and gathering and hunting inland, even up into the intermontane region and over into the jungle. We have evidence for cave use and tool processing sites, but coastal sites hint at sedentism only by around 4000 BC.

ABOUT DOMESTICATION

How does domestication first become possible and then active in a group? Hodder (1991) has addressed this question for the European Neolithic by suggesting that people first had to create the concept of domestication before actions could be taken. I suggest that the physical and social development and maintenance of the kin-line and family was an active ingredient in initiating the concept of both farming and territoriality. Things and places would begin to be associated with activities that surround families. A jurisdiction over a plant, tree, or place on a stream (a loose ownership) was probably developed through using the thing or place in special ritual time. This concept could have been expanded upon and other *things* could then become ‘domesticated’ or incorporated into a family’s array of collective memories and associated things. This could include clay for pottery, springs for water, plants and where they grow, resources for building shelters and making tools, as well as whole landscapes for living in. The objects have to take on new meanings and identities. Human influence (impact, power, or a sense that humans have made a difference) is linked to meaningful interactions with a thing (‘a loose form of domestication’), and this interaction creates a sense of identity.

How did people change their view of the landscape such that they began to see it as a place and a territory rather than just something they move through? Thomas (1993) has suggested that, as seasonal rounds became more regular and as locations were repeatedly visited by the same people, a series of encounters with these specific locales would become incorporated into the people’s collective memories and cosmologies. Each place became invested with past memories and meanings. These special places in turn influenced the activities that occurred there, creating group identity and social relations within the group (Thomas 1993:82). Such locations and associated remembrances would have existed where specifically charged interactions transpired. At times these would have been events that included the use of the local vegetation and animals. These marked places could have become special, expressly because they were where certain plants or animals inhabited and/or where these life-forms interacted with humans. These places or plants could have gained meaningful identity through such recurring activities. People identify with and therefore signify (‘domesticate’) places, as well as flora and fauna, probably well before morphologically defined domestication is evident in the archaeological record.

Social identity therefore is associated with food preferences. As individuals and families begin to identify with a place or with specific activities, they also begin to identify with the food they eat together there (Appadurai 1981; Douglas 1984). A version of this is seen in the totems of many societies, where kin groups identify with certain