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978-1-107-02303-1 - Maize: Origin, Domestication, and its Role in the Development of Culture

Duccio Bonavia

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MAIZE: ORIGIN, DOMESTICATION, AND ITS ROLE IN THE DEVELOPMENT OF CULTURE

This book examines one of the thorniest problems of ancient American archaeology: the origins and domestication of maize. Using a variety of scientific techniques, Duccio Bonavia explores the development of maize, its adaptation to varying climates, and its fundamental role in ancient American cultures. An appendix (by Alexander Grobman) provides the first-ever comprehensive compilation of maize genetic data, correlating these data with the archaeological evidence presented throughout the book. This book provides a unique interpretation of questions of dating and evolution, supported by extensive data, following the spread of maize from South to North America, and eventually to Europe and beyond.

Duccio Bonavia (1935–2012) held professorships at Universidad Nacional Mayor de San Marcos, Universidad Nacional San Cristóbal de Huamanga (Ayacucho), and Universidad Peruana Cayetano Heredia (Lima), before he retired in 2005. He served as the Assistant Director of the Museo Nacional de Arqueología y Antropología de Lima and has written fourteen books, including *Perú: Hombre e Historia*, *Mural Paintings in Ancient Peru*, and *The South American Camelids*.

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DUCCIO BONAVIA

Translated by JAVIER FLORES ESPINOZA

with appendix by ALEXANDER GROBMAN



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For Lucas and Stephen

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Acknowledgments from the Spanish Edition

Although it may seem an exaggeration, the acknowledgments are for me one of the things I find the hardest when writing a book. This is because no book is ever the work solely of one author, as other individuals, to whom the author is much indebted, have also taken part in one way or another. And there is always the fear that someone will slip by without being acknowledged. I therefore apologize for any involuntary omission.

Clearly this book would not have been written without the help I had from the Universidad San Martín de Porres. This institution not only took over the publication of this book but, even more importantly, allowed me to devote a whole year to the research and preparation of the manuscript. This is priceless in countries like Peru, where retired university teachers receive no support at all with which to continue practicing their profession. I would therefore like to thank the officials in the Universidad San Martín de Porres who made this project possible, particularly Ismael Pinto, Juan Carlos Paredes, and Sergio Zapata Acha, with whom I had a constant contact and who were able to understand my anxieties and needs.

Some individuals did not directly contribute to the preparation of this book, yet without them it would never have been written. Foremost among them is David H. Kelley, with whom I undertook my fieldwork as a student in the oh-so-distant year of 1958. Kelley had participated in the excavations Richard MacNeish had undertaken in Mexico, and so it was thanks to our lengthy conversations that I first became acquainted with the significance those excavations had in regard to maize. It was Kelley who realized the significance the site of Los Gavilanes – which Edward Lanning had discovered – could have. And it was Kelley who suggested to Professor Paul Mangelsdorf that I take charge of the excavations the Harvard Botanical Museum carried out in Huarney in the early 1960s. So it was that I established contact with this master scholar, with whom I constantly corresponded almost right up to the moment he passed away. And Mangelsdorf certainly was the major influence that made me continue studying the maize problematic.

In the late 1950s I found a significant amount of maize remains dating to the Middle Horizon while excavating at Miramar (in Ancón) for my B.A. thesis. After making the due enquiries I was told that Alexander Grobman, from the Universidad Nacional Agraria de La Molina, was the person most suited for their study. I reached him, and he agreed to help me, but our contact then was very brief, for he was about to travel to the United States, where he was going to work with Mangelsdorf. We met again in 1963, and it was then that he presented me with a copy of *Races of Maize in Peru*, the book he had written with some other colleagues and Mangelsdorf himself. It was then that our friendship was formed and that we decided to work together researching preceramic maize. Any thanks will therefore always be insufficient for Grobman, because as an archaeologist, without him I would have been unable to understand the complexities that the botanical aspects of a plant enclose. This collaboration is still going on after 47 years of extended study of materials, lengthy discussions, and several publications.

In 1977 I was able to spend some time in Harvard University's Botanical Museum to prepare the final report of the Huarmey Archaeological Project. With Grobman, I took the opportunity to visit Mangelsdorf in Chapel Hill (North Carolina). He had already retired but was still active. After such a long correspondence, personally meeting him proved an unforgettable experience for me. We spent a whole morning discussing the results attained by the research carried out at Los Gavilanes.

Richard Evans Schultes was the director of the Botanical Museum while I was at Harvard. We befriended each other, and he guided me through Harvard's libraries so that I could deepen my studies and expand my knowledge. It was also Schultes who connected me with Elso Barghoorn, with whom we decided to analyze the Huarmey pollen samples, as well as with Umesh Banerjee, who worked with Barghoorn. His influence in my publications through the advice he gave me was also significant.

At the time Margaret Towle was already sick and had secluded herself in her house. I visited her several times, as I was fascinated by her knowledge of ethnobotany. She also provided advice and taught me how I should treat the assemblage of plant remains associated with maize. Her figure remains unforgettable for me.

I owe a special recognition to Richard MacNeish, who kindly sent me the manuscript of the study Walton Galinat made of the maize remains found during the work of the Ayacucho Archaeological-Botanical Project, and who allowed me to cite it. Without his generosity I would have been unable to analyze the Ayacucho samples or to draw the conclusions here presented.

Several colleagues in the United States have continuously helped me by providing me with the data and publications I required. I am particularly grateful to Ramiro Matos, Gary Urton, and Joyce Marcus. Claudia Grimaldo likewise provided me from England with several publications that I was missing.

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I am particularly grateful to Pierre Drapeau, who for many years has been sending me from Canada the journals *Science* and *Nature*, thus allowing me to keep abreast with the latest advances in my field, and to amass a large part of the data used in preparing this book. This task is now being carried out by Thomas Fisher, my son-in-law.

Santiago Uceda helped me every time I needed any information on the North Coast. Joyce Marcus and Kent Flannery kindly provided me the photograph of the Guilá Naquitz Cave. The Universidad Nacional Agraria de La Molina gave me permission to reproduce on the cover of the Spanish edition of this book the beautiful charcoal drawing made by Sabino Springett, one of the most renowned Peruvian artists. Carlos M. Ochoa provided me with photographs of Cuzco maize.

One of the hardest tasks in Peru is having access to the bibliographical data required. I am thus forever grateful to Ramiro Castro de la Mata, who gave me unlimited access to his library, which clearly is one of the most complete ones in Peru on historical works. Fernando Silva Santisteban is another friend and colleague who helped me in this. Here I must also mention Ricardo Sevilla, who loaned me some specialized studies of maize that I was missing.

Some sections in the book deal with subjects of which I have an insufficient grasp, and that always leave me with lingering doubts. In these cases their revision by a specialist is of the utmost importance. I am grateful in this regard to Ramiro Castro de la Mata, Elmo León, José Iriarte, Alexander Grobman, and Uriel García Cáceres, who read some parts of the manuscript and made invaluable suggestions.

Mercedes Quispe Palomino was most helpful whenever I had doubts or problems with Quechua terms.

The bibliography clearly is the spine of a study of this type and therefore has to be as accurate as possible. I am most grateful to Juan Yataco for having helped me check the bibliographical data.

But in the modern world there is another type of support that proves essential, particularly for the elderly, that is, the intricacies of computers. The help of Ricardo Solís was invaluable in this regard.

Another essential support, without which one cannot find the peace of mind required for writing a science book, is that of the family. The permanent support I had from my children, Bruna and Aurelio; my son-in-law, Thom; and my two grandchildren, Lucas and Stephen, who have managed to be always close to me with their encouragement and affection despite the distances that separate us, are the pillars on which this book was raised. And there also is someone who is no longer here but was ever present – my late wife, Anna, who was in all of my publications a faithful partner, a meticulous secretary, and an astringent critic. Her words have lingered on and provided me the encouragement I needed whenever problems arose, the deadlines loomed closer, and it looked as if the book would never be completed.

Last of all I would like to thank all those colleagues who have harshly and unfairly criticized the position Grobman and I had, or have simply ignored us because we are not mainstream. They unwittingly provided the encouragement I needed to conclude this synthesis, which is the result of many long years devoted to the study of maize. Now the task is in the hands of young archaeologists. However, although in some pages I have been extremely harsh, this was only because my duty as a man of science demanded it, yet nothing in these harsh judgments was personal.

Postscript. Correcting a book and organizing its contents according to editorial guidelines is extremely taxing, because one must be not just extremely well prepared but also committed to the text in order to avoid changing the author's ideas. This task is even more complex in a specialized publication like the present one. The work done by Juana Iglesias in this regard is exemplary. So I must acknowledge that in all of the experience I have had with publications of this type, I have never met a person as versed in this as she is.

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Acknowledgments to the English Edition

One of the biggest satisfactions any author can have is that of revising his work, correcting it, and particularly updating it. When Father Johan Leuridan Huys, the dean of the Facultad de Ciencias de la Comunicación, Turismo y Psicología, in the Universidad de San Martín de Porres, asked me to prepare an English edition of this book, I realized that I would be able to carry out all of these tasks. The truth is, I cannot find words to express my recognition.

I would have found it very difficult to undertake the study of maize without the help I had from Alexander Grobman, as has already been noted in the acknowledgments to the Spanish edition. His help in this new edition has once again been crucial. Even more importantly, he agreed to write the appendix on genetics, for which I am most grateful, as it is a subject I cannot dwell on.

Tom Dillehay and Jack T. Rossen kindly allowed me to cite unpublished data from their research in the Zaña Valley. Ramiro Matos, Elmo León, Joyce Marcus, Adolfo Gil, Rodolfo Rafino, and Britta Hoffmann provided me publications that are unavailable in Peru. Gonzalo Castro de la Mata allowed me to peruse his father's library. Any recognition in this regard is insufficient.

Last of all I would like to thank Javier Flores Espinoza for having accepted the daunting challenge of translating such a specialized work as this book is.

Duccio Bonavia

We note with great sadness the passing of Duccio Bonavia on August 4, 2012, at Magdalena de Cao, Department of La Libertad, in northern Peru. He had returned from his retirement in Canada to put some finishing touches on the archaeological project at Paredones and Huaca Prieta, which he co-directed with Tom H. Dillehay. His last stand was near the archaeological diggings in Peru, which permitted him to unlock the secrets of the past and to open a treasure chest of knowledge about the early cultures of the Peruvian coast, which were waiting to be exposed.

This book, one among many others derived from his research and writing, was, as he confessed to me, the pinnacle of his work and his greatest achievement during a lifetime devoted to archaeology and, more specifically, to the

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understanding of the role of maize in the evolution of cultures in the American continent.

As, due to his passing, Bonavia was unable to review the final corrections, this crucial work was done by Ms. Laura Wilmot with the assistance of Bruna Bonavia-Fisher and Alexander Grobman. They both wish to thank and commend Ms. Wilmot for her excellent contribution in editing, reviewing, and correcting the grammar, minor inconsistencies, and other details of the text of the two parts of this book and in coordinating the index.

As a result of his last work at the Paredones and Huaca Prieta sites in northern Peru, Bonavia coauthored a recent article, which was published in early 2012, while the present book was in publication. This article is of great significance and supports the main hypothesis of the evolution of maize in South America. A summary of this research is inserted at the end of the appendix.

May this book serve as a lasting milestone of the advances forwarded to science by Duccio Bonavia on the road to achieving a greater understanding of the evolution of early cultures in Peru and the Andean region.

Alexander Grobman
Lima, October 2012