
David Watts
— to the surprise of many — when it gave the Secretary of the Interior the power to ration water to the states in times of shortage.

In other chapters Dr. Mann presents the history of the battle between private and public power interests in Arizona, and he also covers the problems of management of water and allied natural resources from many viewpoints. Of interest is the inclusion of four chapters devoted to a summary of research on various water problems of Arizona as it was being carried on by both Federal and state agencies.

Since the book went to press, additional research has shown that the return to the economy from using water for irrigation is extremely low per unit of water consumed compared to other uses of water such as in industry and other urban uses and in recreation. In fact, it is asserted that there is no real shortage of water in Arizona at present, only a shortage of cheap water for agriculture. If irrigation of low-yielding food and feed grains and forage crops were eliminated, the more than three million acre-feet a year overdraft on the under-ground water resources could be wiped out without affecting other agriculture.¹ How to do this, and how to distribute higher yielding crops and other uses to areas where the water is available is one of the problem addressed in a related context by Dr. Mann. He suggests on page 257 that:

« The law of the market place unquestionably has its virtues in regard to many economic questions. But when the question involves the fundamental basis of the economy, as the question of water does in Arizona, it would appear necessary to take the long view, to place the short-run economic interests in the context of the future economy of the state, and to provide the leadership in gaining acceptance of the policies which will bring more efficient utilization of the existing water supply and whatever adjustments might be required to meet changing economic conditions. »

As Dr. Mann clearly shows, overall planning of water use and development in Arizona is badly needed. Perhaps this is the most important point of a generally well written and interesting book.

Andrew W. Wilson, University of Arizona.


For many years, Carl Sauer has helped to unravel the complexities of Middle American cultural and historical geography in a series of articles which bring together the various relevant threads of human and physical geography. His latest book, The Early Spanish Main, is an important work which is concerned with what are probably the most significant years in the post-Columbian cultural development of the Hispanic New World — those which cover the initial clashes of two broadly-different culture groups (Spanish and Amerindian), from the first discoveries of Columbus to the major transference of colonial interest from the West Indies to Tierra Firme, which followed Cortez' expedition to Mexico in 1519. Without a full appreciation of this influential period in Middle American history, many of the later trends of this area's cultural development cannot be understood, and this study by Sauer forms a deeper analysis of the events of those years than anything written hitherto.

The main thesis is that this period gave rise not only to a major culture clash, resulting from Spanish expansion into a then « New » World, but also to new precedences for political and economic control of the conquered territories. Both were to have far-reaching and often disastrous consequences in their later development.

The « New » World which Columbus reached during his search for a western sea-route to the Orient proved in the main to be hospitable and well-populated, with established, stable cultures, organised around leading caziques, and supported by traditional conuco agriculture, which provided an abundance of food. No matter what the tribal differences in the circum-Caribbean

area, these basic features of Amerindian life were common to almost all in the pre-Hispanic period. Densities of Indian population appear to have been high, and Sauer finds acceptable the Las Casian estimates of ca. three million Indians in Hispaniola, a broadly-similar figure for Jamaica, and ca. two million in Castilla del Oro. Peripheral islands, e.g. the coral limestone islands of the Bahamas and Barbados, also had a numerous population. Yet by 1519, following Spanish settlement, this population had been decimated or completely removed in many parts of Middle America.

A search for the geographical causes of such a massive population change constitutes one of the major themes of this book. One prime factor was certainly the unceasing quest for gold, instigated by Columbus, and later encouraged by a succession of misguided directives from the Spanish court, or by ruthless and unsavoury leaders such as Pedrarias Davila of Castilla del Oro. When taken away from their conuocos to work in goldplacers or mines, Indians died in large numbers, and many more were butchered by the new settlers in order to obtain political control of additional areas and extend the search for gold. Once local Indian labour had been used up, peripheral islands had their population removed as slaves. By 1519, when pressure exerted by the Dominicans, Las Casas and others had resulted in a more enlightened official Indian policy, very few Indians were left in Spanish-controlled areas, and those that remained were reduced in numbers still further by European diseases.

Such a massive destruction of Indians, their culture and their agriculture, naturally gave rise to major changes in environment. Immediately, agricultural food resources declined, since most Spanish settlers knew nothing of crop production and had depended on the Indians for their food; this was especially true of the islands, where the rapid impoverishment and removal of certain native faunal elements (parrots, iguanas, Indian dogs, etc.) bears witness to the subsequent desperate search for food. Some islands, such as Barbados, reverted to forest so completely that later settlers could find no trace of former inhabitants. Even on the mainland, previously well-tended areas on the Caribbean coast of Panama changed quickly from cultivation and savanna to brush and impassable forest once the population had declined; Sauer notes that this forest was later to become one of the most notoriously disease-ridden in the New World, a strange contrast to the situation in the pre-Hispanic period.

Of course, this book is concerned with many additional items of interest to the historical and cultural geographer, especially those dealing with the nature of Indian cultures and their food resources, the chronology of exploration, and the economic and political basis of life in the new colonies. In the first few chapters, Sauer concentrates primarily on developments in the Caribbean, especially on Hispaniola, and turns later to the penetration of Tierra Firme to the Pacific. Throughout, maps are well chosen to clarify the argument.

It is a pleasure to review a book based on the possibly old-fashioned geographical virtues of detailed field observation and documentary analysis. Together with Sauer's intimate knowledge of Middle American cultural values, this combination has given rise to a significant reassessment of one phase of the evolution of landscape and culture in this area. As such, *The Early Spanish Main* forms an important addition to existing works on the origins of geographical change in the Americas, and will be an easily-readable major reference source.

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**GÉOGRAPHIE ÉCONOMIQUE**


Rather than write about energy in terms of particular sources (e.g. coal or oil) or regional characteristics, Professor Manners' approach in this effective little book is to identify and evaluate the groups of variables which may be used to explain the geography of energy. Consequently the reader will not find this volume useful as a source of energy data for it is not intended to be a