

factors in fraud and contraband, for example, he assumes and argues that they were comparatively low in the sixteenth and eighteenth centuries, but very high in the middle decades of the seventeenth. This is approximately the truth perhaps, but exaggerated, and illustrative of the dangers possible when the historian's educated guesses follow too closely what he hopes to demonstrate.

Morineau also lacks information on the local and general Spanish American context, the context which produced and shipped all that silver. His estimates of the Tierra Firme fleets of 1654, 1661, 1663, and 1679, for example, are all too large according to American information on such matters as falsified coinage, failed Portobelo fairs, and totals loaded at Panama (all too detailed to discuss here); and to revise downward the total shipment of bullion on these four fleets is to alter drastically Morineau's figures for the quinquena 1651-55, 1661-65, and 1676-80. It leaves us, in fact, with a modified but significant downturn in silver exports to the Old World, running from the late 1630s to the 1680s.

Morineau has much of value to impart. He cautions with intricate, solid reasoning against an emphasis on mining output, precious metals, and coinage, as indicators of economic life and health. He damages many generalizations about trade and conditions of trade in the seventeenth and eighteenth centuries, offering a much more nuanced picture heavily influenced by political and agrarian phenomena. He brings the Brazilian gold boom into larger and more accurate focus, for both Brazilian and European history. He unravels the very doubtful link which both Hamilton and the Chaunus made between total ships' tonnage and capacity on the one hand, and the quantity and value of the goods carried on the other. He explains the economic role of accumulated stocks of bullion and coinage in a given region, how much their specific uses determine their economic impact, and how these stocks can continue to accumulate and be transformed into capital even in difficult times. Only when his passions lead him to scathing rejections of all past work by certain authors must the reader beware of critical flaws.

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MURDO J. MACLEOD

*Irrigation in the Bajío Region of Central Mexico.* By MICHAEL E. MURPHY. Boulder: Westview Press, 1988. Maps. Figures. Appendix. Glossary. Bibliography. Index. Pp. xii, 226. Paper. \$21.50.

A major breadbasket of colonial Mexico, the Bajío has attracted substantial scholarly interest in recent years. Michael Murphy's compact but carefully detailed study of colonial water use provides a useful technical supplement to this scholarship. Based largely on sources in the Tierras and Mercedes sections of the Archivo General de la Nación in Mexico City, the book includes four subregional studies tracing the building and operation of local irrigation systems in Celaya,

Salvatierra, Salamanca, and Querétaro, followed by thematic chapters on agriculture, technology, and water law. The author also analyzes the development of city water systems in Celaya and Querétaro.

The ecology and economics of colonial agriculture made irrigation important in the Bajío. Although only Indian subsistence farmers had incentives to intensify cultivation through irrigated double-cropping, hacendados found that irrigation enabled them to produce wheat during the dry winter months and thereby avoid fungal infestations and other hazards of the rainy season. Subject therefore to meteorological cycles different from those of maize, wheat offered a welcome means of diversification and a consequent hedge against crop failure. Moreover, since subsistence farmers produced little wheat, the crop did not experience the destabilizing shifts in supply and price that characterized colonial markets in maize.

Although members of the landowning local elite took most of the initiative in allocating water among competing users, “sporadic interventions of central authority” (p. 200) invoked the protective features of colonial law and shielded smaller claimants from blatant usurpation of their water rights. Except when they needed to safeguard city water supplies, municipal authorities played relatively minor roles in regulating water use.

In his chapter on irrigation technology, Murphy acknowledges that for much of the colonial period Mexicans lagged far behind their European contemporaries. By the early nineteenth century, however, they had made significant progress in closing the gap. Murphy concludes that Alexander von Humboldt seriously underestimated the technical and architectural expertise evident in late colonial water systems of the Bajío. Enhanced by present-day photographs of surviving irrigation works and helpful explanatory drawings that accompany the reproductions of colonial maps, Murphy’s book provides a solid contribution to our knowledge of the colonial Bajío.

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CHERYL E. MARTIN

*Arquitectura y arte sacro en Yucatán: 1545–1823*. By MIGUEL A. BRETOS. Mérida: Editorial Dante, 1987. Illustrations. Photographs. Notes. Appendix. Bibliography. Index. Pp. 277. Paper.

Opacado por el prehispánico, el Yucatán colonial sufre del mismo olvido característico del discurso nacionalista mexicano, empeñado en negar tercamente uno de los componentes de la pluralidad cultural del México de ayer y de hoy. Tal hecho se comprueba, una vez más, en el estudio de Miguel Bretos.

Norias, conventos, aljibes, camarines, templos, relojes de sol, murales, capillas, surtidores, obras de lapidaria, orfebrería y retablos se suceden a lo largo de los siete artículos que componen la obra. En ellos—entremezclados con datos histó-