



# standards

recipes for reality

Lawrence Busch

"Lawrence Busch's book, *Standards: Recipes for Reality*, illustrates with vivid clarity the ubiquity and importance of these 'things' called standards. Rather than present a dry economic text or a singular discipline's focus, Busch has proposed a 'Unified Field Theory' for standards—a multidisciplinary view of standardization. For anyone interested in standardization from a policy, technical, or social perspective, this volume is absolutely essential."

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"With enviable style and impeccable clarity, Busch shines a bright beam into the anonymous, invisible world of standards to reveal how these commonplace instruments order the messy world we live in. This deeply thoughtful work of political sociology is a must-read for anyone concerned with the hidden dynamics of power in contemporary industrial democracies."

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"This book demonstrates that Lawrence Busch is not only an outstanding expert and even connoisseur of the subtle nuances of the world of standards that are used to make and unmake the world; he is also a critical analyst of their political and moral significance. Deeply informed by debates in the social sciences, economics, and even analytical philosophy, the book combines a rigorous examination with a great sense of humor in a journey that leads the reader from Harlequin romances to the auditable firm."

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"It is hard to imagine a more contemporarily relevant topic than that of *Standards: Recipes for Reality*. Our times, marked by economic bubbles, political partisanship, and a search for sustainability, would profit from Lawrence Busch's socio-cultural studies romp through histories and cultures seeking balance for standards and ways to ensure a good life."

**Don Ihde, Distinguished Professor of Philosophy, Stony Brook University**

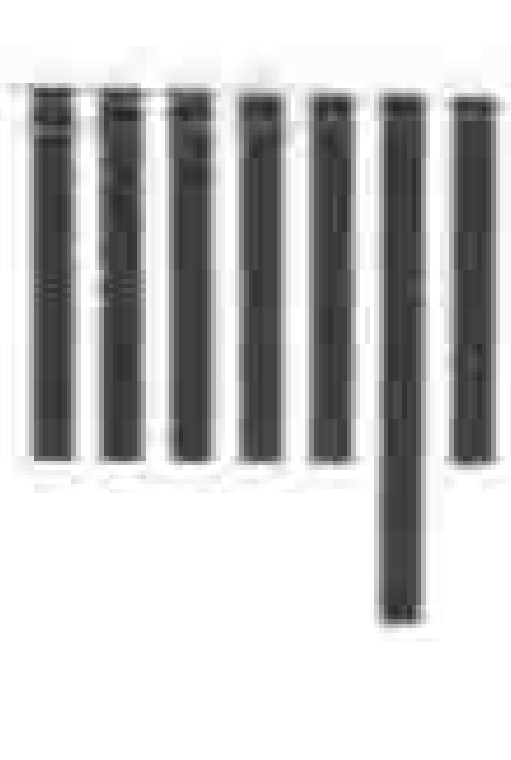
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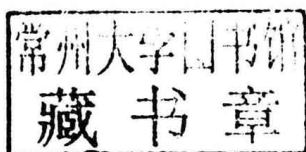
# standards



**Standards**

**Recipes for Reality**

**Lawrence Busch**



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## Prologue

Consider the following vignettes:

1. July 1847: American soldiers were on the outskirts of Mexico City. The Mexican general, Santa Anna, concentrated his forces in Churubusco, where there was a fortified bridge and Franciscan convent. American soldiers advanced slowly under heavy gunfire. In the convent, the Mexican soldiers and a group of Irish American deserters known as the San Patricios began to run low on ammunition. Santa Anna had another wagonload of ammunition brought to the convent. But the ammunition was of the wrong caliber for all the guns save those of the San Patricios. The Americans soon captured the convent and entered Mexico City (Nordstrom 2006).
2. California produce growers are caught between a rock and a hard place, or perhaps we should say between the birds and the bugs. New environmental programs include standards for providing a place for wildlife habitat. But food processors, worried about bacterial contamination of food that might make people sick as well as ruin their brand names, are encouraging a set of standards known as “clean farming techniques.” These techniques include poisoning rodents and the removal of wetlands that harbor bacteria (Beretti and Stuart 2008; Martin 2006).
3. As part of its obligations under the Kyoto Protocol, itself part of the United Nations Framework Convention on Climate Change, the United Kingdom developed a rather substantial market for carbon emissions. However, at least initially, the UK government failed to establish standards for emissions trading. Thus, certain of the emissions credits purchased did not actually qualify under the Kyoto agreement. Other reductions would have happened regardless of the schemes, while still others were only temporary. Recently, the UK government had to step in to begin to certify that carbon offsetting schemes actually met the requirements of the



agreement (British Broadcasting Company 2007). Although the United States has yet to sign the agreement, the same problems appear to exist with respect to claims made by some U.S. firms (Elgin 2007; Green and Capell 2008).

4. In the late 1950s China embarked on the Great Leap Forward. Peasants were encouraged to build backyard steel furnaces and to produce industrial goods. Some years later in Guinea, the Chinese were building a small dam. A large number of dump trucks resembling the French Citroën 55 were imported. However, unlike the French trucks, over time, their chassis began sagging. This continued until the drive shaft was no longer connected to the rear axle. At that point the truck would grind to a halt and would usually be discarded at the side of the road. Discussions with mechanics revealed that engine parts from one truck did not necessarily fit others; each truck had apparently been made individually. In short, not only was the steel frame of the truck not of a sufficiently strong (standardized) alloy, the engine parts were not standardized. As a result of these deficiencies, the trucks remained serviceable for only a short time, after which they became piles of scrap metal.

5. The Panamax standard refers to the maximum size ship that can navigate the Panama Canal. It consists of a length of 294.13 meters, a beam (width) of 32.31 meters, and a draft of 12.04 meters (Autoridad del Canal de Panamá 2005). Since about 4 percent of world trade goes through the canal, many ships are built to precisely these dimensions. Bigger ships are more efficient but cannot fit through the canal. For example, the *MOL Encore* was built to meet those specifications (*Ship-Technology* 2008). It can carry thirteen rows of standard shipping containers on its deck, each 8 feet (2.438 meters) in width. Manufacturers of cardboard boxes designed to fit inside shipping containers without wasting any space must make them of such dimensions that the sum of the widths of the boxes is 7 feet 7 inches (2.3111 meters), as the interior width is slightly smaller than the exterior width. Products that do not fit within these dimensions must either be disassembled for shipping or shipped as unpackaged cargo requiring special handling at much higher rates.

6. Is Pluto a planet? Like the other eight planets, it goes around the Sun in an elliptical orbit. Indeed, dictionary definitions identify planets as large heavenly bodies that revolve around stars. But recently the General Assembly of the International Astronomical Union—the organization that sets standards for planets—determined that Pluto was not a planet after all. It was demoted to the category of “dwarf planet,” a title it now shares with Ceres and an object called UB<sub>313</sub>. Planets have been confined to our solar

system and to bodies that have sufficient mass to have cleared the neighborhood around their orbit (Sykes 2008). Not all astronomers are happy with this decision and hundreds have signed a petition to return to the older definition. Moreover, soon afterward, in March 2007, the New Mexico House of Representatives voted unanimously in favor of a resolution that Pluto is a planet (Holden 2007). That in turn raised another question: Just which earthly body has the final authority over the classification of heavenly bodies?

What unites all these vignettes is that, although they are about entirely different topics, they all involve standards. In fact, one can pick up the newspaper nearly every day and find stories about standards—standards for people, for the environment, for consumer products, for the welfare of animals, for accounting for public funds, for the acceptable stress of highway bridges, for health care, for education, for just about everything. Yet these standards are nearly always considered separately; their similarities and differences *as standards* are hardly ever discussed. In this book I aim to remedy that situation.



## Acknowledgments

No volume of this complexity can be the work of one person. Like all authors, I have benefited from conversations and correspondence with numerous colleagues, acquaintances, friends, students, and critics. Paul Thompson provided comments on an early draft of the manuscript. William H. Friedland, Stefano Ponte, Elizabeth Ransom, Vladimir Shlapentokh, and Josh Woods carefully perused the entire manuscript and provided very helpful comments. In addition, the late Susan Leigh Star spent countless hours with me discussing a wide range of issues. Warren Samuels, Nicolas Mercuro, and Alan Schmid advised me on some fine points of economics. Kyle Powys White provided some useful comments on justice. Students in my graduate class on science and technology—Sana Ho, David Holt, Tazin Karim, Delanie Kellon, Xueshi Li, Allison Loconto, and Margaret Robinson—were subjected to the painful process of reading the manuscript as well. Martin Brett kindly replied to an unsolicited email and provided me with help in locating some medieval manuscripts on standards. Rhoda H. Kotzin helpfully pointed me toward the work of J. O. Urmson. Marietta Rice introduced me to the Families and Democracy Project.

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My wife, Karen Busch, tolerated my endless rantings on various aspects of standards over various meals, while driving from one place to another, and even in bed before (or instead of) sleeping. Perhaps as a result of that, our four grandchildren—Grace, Lilu, Niko, and Zoe—may eventually find this book to be of help in making sense of an increasingly complex world. To all of these institutions and people, the standard thanks and disclaimers apply. A heartfelt thanks to each and every one of them. Any errors are entirely mine.

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## Introduction

[W]hat I would like to show is . . . how a particular regime of truth, and therefore not an error, makes something that does not exist able to become something. It is not illusion since it is precisely a set of practices, real practices, which established it and thus imperiously marked it out in reality.

—Michel Foucault (2008, 19)

The hardcover edition of this book was typeset using a 9-point proportional font, bound in signatures of sheets of paper that meet the guidelines of the American Library Association, and should last for several hundred years. Normally readers pay little or no attention to these seemingly trivial facts. Nor do most philosophers, historians, or social scientists. We may marvel at the engineering of brick walls by the ancient Chinese, the clarity of sound of our new iPod, or the skill employed by a heart surgeon. Similarly, we may curse the complexity of the tax forms we complete each year and the speeding ticket we have just received. However, most of us lose interest rapidly at the mention of standards for bricks in the ancient world, for the earpieces in our iPods, for enforcement of traffic laws, or for the construction of tax forms. Yet without people concerned about and working on—indeed, obsessed with—these and myriad other standards, our modern world would be an impossibility. Yes, it is true: we have never been modern, as Bruno Latour (1993) asserts in the title of his book, but we have expended an astonishing amount of energy trying to be so. The modern project has not been successful to date and likely will not be in the future, but a project it has been nevertheless. Standards have been central to it.

Yet even as standards have been the subject of discussion in education, health care, information technology, and product quality circles, among others, only a handful of authors have examined just what standards are and what standards in these very diverse fields have in common. Do standards for scientific instruments, citizens, health care, athletes, horses,



frozen peas, tax forms, and automobiles have anything in common? Is that connection a fundamental one that says something about the way in which we organize our world, or is it merely a semantic curiosity, perhaps a leftover from previous and now archaic meanings?

Every day as we go about our business we take for granted a vast array of standards, each of which has been and continues to be the subject of intense negotiation. Paradoxically, we see these standards (or rather we do not see them) as taken-for-granted aspects of our daily life. As the great champion of liberty Benjamin Constant ([1815] 1988, 75) observed nearly two centuries ago, “man adapts himself to those institutions that he finds already established, as he does to the laws of physics. He adjusts, in accordance with the very defects of such institutions, his interests, his speculations and his entire plan of life.”

Put differently, we find ourselves in a position like that of Monsieur Jourdain in Molière’s celebrated play, *Le bourgeois gentilhomme*, who did not know that everything he said was in fact prose. When we walk from one room to another inside our homes, or take a stroll in a city park, or ride the elevator to an upstairs office, or purchase a meal in a restaurant, or open a book to read its contents, or apply for a driver’s license, or take an exam, or wash up after work—in each of these instances and many more we tacitly accept and adapt to a vast array of standards.

Perhaps because these standards are so taken for granted, they are rarely the subject of discussion in circles beyond those in which they are formulated. They are even more rarely the subject of discussion in the public square, in democratic institutions of government, or among friends. Indeed, standards are so taken for granted, so mundane, so ubiquitous, that they are extremely difficult to write about. They are usually noticed only when they fail to work. After all, history is largely the record of *events*, of things that are not routine, of changes that have occurred. In attempting to write this book I quickly discovered that what seemed a rather straightforward project involved inquiring into a vast number of subjects about which I can hardly claim any expertise. Yet, as I hope to make clear, standards shape not only the physical world around us but our social lives and even our very selves. Indeed, standards are the recipes by which we create realities.

The heart of the difficulty is that all standards invoke the linguistic categories we also use to organize the world. For example, a standard for a Valencia orange implies that the user of the standard knows the meaning of Valencia (a particular variety that was developed in California but is named for Valencia, Spain) and of orange (a type of citrus fruit). Of course,