

## HISTORY OF SCIENCE

## Babylon, Newton, and All That

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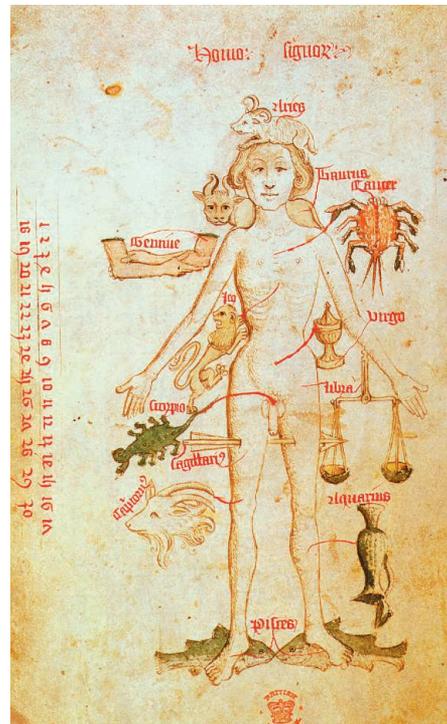
Everyone agrees that science has a history. Reflect a little, and you'll realize that science must have many histories: For while we often talk about a generalized ideal of "science," we usually hold in our minds one of several specific sciences, each with its own set of questions and stories. And then there is the inescapable fact that nothing humanly produced takes place in the same way everywhere. Warfare is global, too, but no

one expects it to have a single history. You can write a history of science, but never the history of science.

Which brings us to Patricia Fara's ambitious and intriguing *Science: A Four Thousand Year History*. In a series of short chapters—49, self-consciously grouped in seven groups of seven—Fara aims to chronicle the sheer multiplicity of endeavors that have been labeled as "science," "natural history," "natural philosophy," "mathematics," or any other such designation. It is a huge task, and one would be well within one's rights to expect such a venture to be necessarily incoherent, even impossible. This book will not fully resolve those doubts: there are the inevitable incoherences and impossibilities. But Fara (a historian of science at Cambridge University) has made an impressive and commendable effort to square the circle, to tell science's history, from the beginning.

When was that, exactly? Fara starts with Babylon, which is as good a place as any. The arithmetical records of Babylonian astronomy comprise perhaps the oldest documented investigations of the natural world: they are quantitative and collaborative and seek to predict the future positions of celestial bodies. But they also possess two features that confound any simple identification with "science": they lack geometric or physical models for the heavens, remaining content with numerologic regularities; and they are saturated with astrology. Fara selects Babylon as her origin not despite these features but because of them. It is the very dissonance, the jumbling together of incongruities, that fasci-

nates her. (This is also why sevens percolate throughout her account—a tip of the hat to the many number mystics of past science. To appease the Babylonians, it would have been better to choose six, but no matter.)



**Astrological medicine.** Zodiac man (1486) displays the association between parts of the body and star signs.

Fara has not one birthplace for science, but three. The book is almost unique among popular surveys of the history of science in devoting substantial attention to the Chinese natural philosophical heritage. Almost as ancient as the Babylonian tradition, this is certainly the oldest continuous one, and Fara draws from recent scholarship to flesh out an interesting picture. But this attention peters out fairly early, as the book shifts to the more canonical origin for science.

That would be Europe. For all the attention that Fara devotes to debunking heroic narratives supposedly perpetrated by most historians of science—Isaac Newton draws her particular ire—from Babylon and China she goes on to replicate much of the standard narrative: first Greece, next a light touch on Rome (mostly Galen), the Christian West through to the early modern era, and then a slower pace from the 18th century to the

present (with a heavy, some might say excessive, attention to developments in Britain). We only glimpse China once or twice more and never really see Latin America or Africa except from shipboard. (On the other hand, her account of science and medieval Islam is spot on.)

The author claims that she is offering a corrective to typical treatments in "[o]ld-fashioned histories of science," although the offenders are never specified and haven't been much in evidence for over a generation. The revisions are well chosen and include the importance of medieval universities, the role of public display, and the crucial science-religion interaction (not hostility). The details of her story are drawn substantially from the historical literature of recent years. But there are some unfortunate omissions, such as the exciting recent research in the history of alchemy—a far cry from the mystical, secret preoccupation Fara depicts, and instead something we might recognize as early chemistry.

Fara tries to situate certain heroes in context, so they don't stand as lone geniuses: "During their own lifetimes, scientific heroes often appeared less important than they do in retrospect, when they are admired for leading presciently towards a future that their contemporaries could not possibly have known about." Very true. So Newton is exposed, warts and all, and Galileo is shoehorned into a brief chapter with the rest of early modern astronomy. But these figures are replaced by new, only slightly less canonical heroes: René Descartes gets a chapter all to himself, and Francis Bacon appears often as a beacon. Perhaps the history of science does need to take its heroes down a peg, but replacing them with the very next tier is surely a stopgap solution.

Fara's *Science* attempts to span four thousand years, and it would be churlish to quibble and pettifog about this anecdote or that interpretation. The book can be read with profit as a general introduction to some of what has been happening in the history of science since the 1980s. It offers pretty exciting material. But fundamentally the scale of Fara's project overwhelms it. More science, however defined, has been done since 1945 than in all of history until then. Because Fara boldly takes the long view, she is regrettably forced to foreshorten the recent past. Instead of providing a rousing crescendo, the book's discussion of the present almost whimpers: "The problem is not that scientific technology is in itself bad, but that it can too easily become a tool for domination and coercion." Of science's many histories there is surely more to be said.

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## Science

A Four Thousand Year History

by Patricia Fara

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