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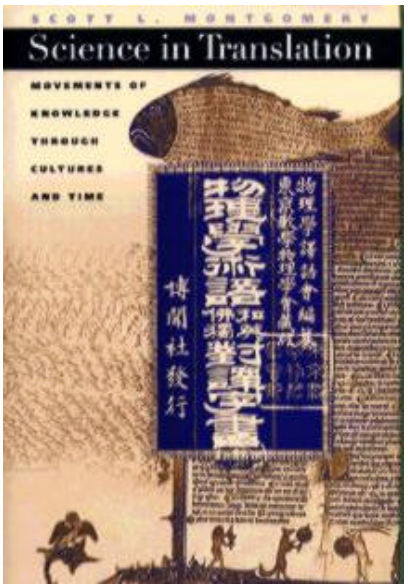
Compte rendu

Science in Translation: Movements of Knowledge Through Cultures and Time

by Scott L. Montgomery



The general subject of translation is fascinating enough to have generated a library's worth of essays, but on the restricted subject of scientific translation, this book by Scott Montgomery seems to stand alone on the shelf. A good thing, therefore, that it is so full of good things, both in the content and the prose. Arranged and written more topically than chronologically, it is more of an essay than a history, but it can be read both ways. Montgomery does his best, despite his wealth of specific examples and illustrations, to locate scientific translation, together with the science it has made possible, in the intellectual and cultural life of the whole planet. Ambition like that can throw a book's outline into a cocked hat, and readers

may sometimes feel they have wandered off the map, or find matters in the conclusion that might have done better service in the introduction.

This reader, for one, would have welcomed being told at the outset that *Science in Translation* draws almost all of its examples from the history of translation in only three scientific cultures: that of the pre-modern West, that of Japan, and that of 20th-century global English (and the "localized forms of English" that are responsible for its ambiguities). It is true that the pre-modern West is so broadly and extensively treated that the whole bizarre odyssey of Greek science through Latin, Pahlavi (Persian), Syriac, Sanskrit, Hebrew and Arabic is traced; but this threefold plan requires Montgomery to assume, despite all his extraordinary breadth of learning and many protestations of openness and internationalism, a western definition of what constitutes science. It also raises a very large epistemological question which Montgomery does not address until very late in the book; whether the assumption that nature is uniform implies that all science must be the same, in some deep sense, regardless of the language it's written in or the culture in which it may have developed.

Perhaps the best of the book's many delightful challenges to conventional wisdom comes in the first section on the translations of Greek science. Here we learn why it is ridiculous to use a phrase like "the Renaissance recovery of the Greek classics;" that in fact the Renaissance recovered very little from the original Greek and that it was long before the Renaissance that Aristotle and Ptolemy, to name the two most important examples, were finally translated into Latin. What the Renaissance did was to create a myth by eliminating all the intermediate steps in the transmission. To assume that Greek was translated into Arabic "still essentially erases centuries of history" (p. 93) What *was* translated into Arabic was usually Syriac, and the translators were neither Arabs (as the great Muslim historian Ibn Khaldun admitted) nor Muslims. The real story involves Sanskrit compilers of ancient Babylonian astronomy, Nestorian Christian Syriac-speaking scholars of

Greek in the Persian city of Jundishapur, and Arabic- and Pahlavi-speaking Muslim scholars of Syriac, including the Nestorian Hunayn Ibn Ishak (809-873) of Baghdad, "the greatest of all translators during this era." (p. 98) In a negative sense, it also derives from the indifference of practical-minded Roman translators, from Cicero onward, to mathematical astronomy and Aristotelian physics, an indifference which left the Latin speakers of late antiquity and the Middle Ages (Augustine, for example) bereft of translations and thereby cut off from the scientific triumphs of Hellenism. The whole story is fascinating and full of contingencies, featuring the great multicultural, polyglot cities of the pre-New York past: Hellenistic Alexandria, Sassanid Jundishapur, Abbasid Baghdad, Almoravid Toledo and Latin Christendom's Venice and Paris. Doubtless it was this section that inspired John Stachel to write that Science in Translation "strikes a blow at one of the founding myths of 'Western civilization'."

If Western civilization received Greek science from several sources and multiple translations over time, Japanese civilization received modern science from the West and in a hurry. Westerners should be fascinated by the tales that result. Modern science in Japan was called "*rangaku*," which means "the study of Dutch." (p. 213) The reason is that although Japan had been following the cultural lead of China for centuries, adopting the complex "Neo-Confucian" view of nature pioneered in the 12th century Sung dynasty and walling itself off from Christians and westerners after their 16th-century encounter, there remained two small leaks in the dike. The first was European Jesuits in China making translations of western technical texts into Chinese. The second was the tiny Dutch trading mission on Deshima island in Nagasaki Harbor where a Japanese scholar could find enlightenment science books written in Dutch. It was this second leak that caused the flood. One example: Dutch books imported through Deshima in the 18th century described the new phenomenon of "*elektriciteit*" which a Japanese scientific translator rendered as "*erekiteristato*" using the Japanese

syllabary, *katakana*. A fascinated *rangaku* scholar, Hiraga Gennai (1729-1780), procured a broken Dutch electrostatic generator and began copying it. He renamed *erekiteristato* "*erekiteru*," which he spelled using the phonetic values of "*kanji*", the Chinese characters naturalized into the Japanese writing system centuries before, and he explained it as the manifestation of the fifth element, fire, in the cosmology of Shingon Buddhism. Not long after Hiraga's death, the Japanese explanation of electricity was recast in a way that westerners like Ben Franklin could have understood more easily — but the word for it was changed to "*denki*," Chinese for a form of the neo-confucian cosmic energy, using the Chinese character for "lightning." (p. 211)

After the wonders of Japanese syncretism, Montgomery moves easily into the less showy problems posed by modern 20th-century scientific English, the main language for the majority of scientists in nearly ever discipline all over the world, and the second language for almost all the rest. He begins, rather startlingly, by arguing a case that should be of enormous interest to mathematicians: that mathematics by itself is not a language. It was Leibniz's hope that one day that thinkers would reach agreement on disputed questions by setting down to calculate; but translators find to the contrary that mathematics simply cannot exist, even in formulas, without an accompaniment of definitions and qualifications in our imperfect and never rigorously logical human languages. (pp. 254-55)

Most of this section, however, is not about translating mathematics but about the curious interplay of scientific writings couched in LFE or "localized forms of English." Slight differences in the lexicon, and larger differences in standard style and form, make a geological article published by an Indian in India quite different from one on the same subject published by Americans in America. Geology written in French in France has "evocative [...] literary qualities" (p. 264) absent in sobersided British English. Here we see the

working translator at his or her task, a task as subtly exacting as translating poetry.

After this, the book's conclusion does not take readers entirely by surprise. Having heard more about how science affects translation than about how translation affects science, and few details, we are treated in the last chapter to an unassuming but powerful treatment of some of the deeper issues of philosophy. Translating science poses in a particularly fruitful way a philosophical question that has been raised repeatedly by thinkers from Carnap to Kuhn, and has become extravagantly important in the heyday of Bruno Latour and the sociologists of science. Is science universal? If it is universal, is it because across all cultures it converges on a single epistemology? If not, is it ontologically universal, describing a uniform nature behind our cultural and epistemological varieties? Are different theories of the same natural phenomena "commensurable" across cultures, or across times and languages? (p. 291) Translation does not exactly answer these questions; but it brings them into superb focus as we try to understand, for example, exactly what the difference is between "*elektriciteit*," "*erekiteru*," "*denki*" and electricity, which began, after all, as a word for the odd properties of amber (Greek "*elektron*") when you rub it. Are such differences merely linguistic? Cultural? Or do they touch the workings of nature itself? Is it possible (just to raise the ante) that Newton's gravitational laws described nature when Newton's "Principia" was published in 1687 — and Einstein's could not? (Einstein's theory didn't exist of course, but neither did anyone in 1687 know precisely how Mercury's orbit now precesses.) We don't know the answers to these questions and there is some good reasoning, going back to Charles S. Peirce in the 19th century, that says we can never know; but that does not make the questions any less fascinating, or the contributions of a patient, learned and modestly stylish translator like Montgomery any the less worth reading.

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