

General to the Colonial Survey and Geophysical Committee, and to the planning for a central organisation to undertake geodetic and topographic surveys in the Colonial Empire. Certainly the latter is noted in Chapter 29, but the reference to “some strongly-worded correspondence” is not elaborated. These are but minor criticisms of a work of prodigious effort, lucidly written throughout, notably devoid of errors which escape even the most vigilant of proof readers, and lightened by liberal quotations. To illustrate the last there is the remark attributed to Hotine when the unit of measure for the National Grid was the subject of intense debate at the time of the Davidson Committee. “It seems absurd to base the unit of the National Survey on a yard, which no-one but a draper uses.”

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THE MAPMAKERS / by John Noble Wilford. New York: Knopf, 1981. xi, 414 p.: ill., maps. ISBN 0-394-46194-0: \$20 US; \$26 CDN.

In her recent review of the latest editions of G.R. Crone's *Maps and Their Makers* and Lloyd Brown's *The Story of Maps*, Anne Godlewski observes in passing that John Noble Wilford, writing in the eighties, progresses in *The Mapmakers* “only marginally beyond Crone and Brown who wrote in the fifties and forties respectively.”¹ It all depends, of course, on what one means by *progresses*. It cannot be denied that Wilford brings the story closer to the present; and in fact he structures his book around descriptions of the 1972 field work for the Bradford Washburn-National Geographic Society map of the Grand Canyon. It might be objected, on the other hand, that in bringing his history up to the moment he lavishes too much attention on it – nearly half *The Mapmakers* is turned over to the 20th century – yet not only is this emphasis refreshing, but also the source of most of the book's impressive strengths, for Wilford is a journalist by trade (science correspondent for *The New York Times*) and where he is able to exercise his craft, the book almost sparkles, and the prose acquires a vibrancy sadly absent in the rest of the literature:

At first the going was easy, one shallow ledge piled on another and another like an uneven stack of pancakes. Bending forward, under the burden of our gear, we felt the slope steepen, the footing become more precarious. Rocks gave way, sliding from their timeless resting places and falling out of sight into the chasm below. Upward, more slowly, more cautiously now. We stretched to cross from one rock to the next, so much sky below. A shuddering sight. Better not to think about it. We anchored our feet and hefted the gear over the top. Then, climbing the ultimate ledge, hiking one leg over the top, and the other, we surmounted Dana Butte. We had reached the high ground where we had a job to do, the establishment of a mapping station. For we had come to measure and to map the Grand Canyon of the Colorado. ... Standing speechless, entranced by the prospect, we became strangely conscious of everything

and of nothing. The sound of silence: a soft whistling of wind, murmuring molecules, and nothing more. The prickly shiver of quiet excitement: in the Canyon there are still many places where, in the old prospector's phrase, the hand of man has never set foot – and, until our visit, Dana Butte most certainly was one of those places.

And certainly this is progress, to write like this on the history of cartography.

Though I doubt that this what Godlewska had in mind, even if it is granted that what she wanted to suggest was that, "In the eighties, it is not to the synthesizing texts that we must look for growth and change but to works perhaps of more limited scope based on primary research,"² it is still not clear that *The Mapmakers* doesn't measure up. It is possible – possibly advisable – to read the book as an extended essay on the ranging ambition of contemporary cartography, an essay firmly founded in primary research. It is, to be sure, a journalist's – one could also say historian's – idea of research, but the second half of the book *is* drawn from, among the secondary sources, forty-one interviews with a healthy cross-section of the American cartographic establishment. Or perhaps this is wrong, and it is not a cross-section of the American cartographic establishment, but of the people who are making maps. And perhaps this is another source of the refreshing quality of the essay.

In any case, many of those interviewed are not professional cartographers, from aerial survey pioneer Virgil Kauffman to University of Pennsylvania professor Peter Gould, from Lamont-Doherty's Bruce Heezen to the Boston Museum of Science's Bradford Washburn, and yet all are map-makers of one kind or another; and even within the profession Wilford roams widely, talking as seriously with cartographers from Conoco and Mobil Oil and the Jet Propulsion Laboratory as with those from the Air Force Aeronautical Chart and Information Center, the National Geodetic Survey and the United States Geological Survey. Wilford finds the scene exciting – it *is* exciting, as exciting as any in the history of cartography – and yet finally, it fails to cohere, remaining, like an unglued collage, a collection of chapters that refuse to come together into a book. And perhaps I expect too much, but of a book that promises to be one whole thing, I ask more than the view of this vignette and that; I ask that they be brought together in such a way that I can find a ground for their being together. Wilford's task was to make sense of the scene, not just sketch it.

His failure to achieve this synthesis is rooted, it seems to me, in his view of the pre-20th century history of cartography, or rather his lack of a view of this *history*, for his fascination is ultimately not with history, but with a story, with the romance of cartography. And if his failure to transcend the limitations of this tradition is what Godlewska had in mind when she spoke of his lack of progress, she could not have been more correct, for here the book not only does not progress beyond Crone or Brown, but limps behind them, not standing on their shoulders as Newton stood on those of Galileo, but stolidly crawling in their dust. There are no fresh insights here into the nature of the map or the achievements of primitive peoples, no new view of the mapping of

ancient or Medieval man, no clearer comprehension of the miracle of Renaissance or 17th-century cartography, no broader perspective than the tired one of Indo-European man: it is Gog and Magog and Prester John as usual, the same enervated quotation from Jonathan Swift, the same exhausted stories of Eratosthenes and Harrison, the same tale, long since without sinews, of the fabulous family Cassini. To write history as a story is inevitably to fall into this trap, for history is not only problematical and confusing, rich with cross-purpose and contradictory motivation, but also awkwardly tedious and dull, ramified and endlessly extended. To tell a story is to dispense with all of this – Brown and the rest no less than Wilford – to focus on a handful of triumphant heroes and colorful eccentrics, narratively connected by a thin line of spurious causality. In *The Story of Maps* Brown was quite explicit about this, arguing that “In order to compile a one-volume survey history, it is necessary to confine the story to a straight and more or less narrow path, to keep close to the line of progress and merely suggest the bypaths, such as the numerous factors which retarded scientific conquest of the unknown,”³ and no less explicit about his characters – “colorful figures,” he called them, “from all walks of life.”⁴ Wilford is somewhat less straightforward about his procedure, but not the slightest bit different. It makes for facile reading, but the results are no less fabulous than the savage-pictures geographers used to use to fill the gaps on their Afric maps.

Romances, says Northrop Frye, are wrapped around quests.⁵ It is the quest that, in the words of George Saintsbury, “provides the opportunity for the desultory concatenation or congregation of incident and episode which is of the very essence of the romance.”⁶ The quest to which Wilford reduces the history of cartography and which provides the opportunity for the concatenation of his “multitude of diverse characters” is *accuracy*, not all that far removed from Brown’s goal of “scientific conquest.” Though *accuracy* is not entered in his index, it is the touchstone for the book. Wilford is excited above all else by the shrinking fractions expressive of error, 6,400 kilometers in 40,000 for Eratosthenes’ estimate of the circumference of the earth in the 3rd century B.C.; a half a degree in 360° for John Harrison’s Number Four in 1761; one part in a million for the Washburn survey of the Grand Canyon in 1972. They are, for Wilford, like signposts on the road to the paradise of zero error, signalling the approach to what in another context he calls “the land as it really is.” Since he is excited by this craft of measurement, and because he is not oblivious to all else, he manages to keep his story alive, but it quickly degenerates into the pursuit of precision for the sake of precision, and becomes as repetitive as the jousts and battles that so stultify us in the romances of the later Middle Ages.

The vision of this quest distorts and finally falsifies history. Despite his wish to have written “a very human story of heroics and everyday routine,” it is only the heroics he remembers to mention. He will write of Han cartography when it has heroic claims to primacy (quoting Bulling to the effect that “the great significance” of the early Hunan maps “lies in the fact that they are in part surprisingly accurate and detailed”), but ignore the subsequent unfold-

ing of Chinese mapping; he will wax rhapsodic about Eratosthenes and Ptolemy, but fail to drop a word on behalf of the work of Dilke's Roman land surveyors; he is eager to amuse us with the follies of Medieval cosmography, but the quiet growth of large scale local mapping explored by Dainville, Harvey and Skelton is allowed to pass unheard beneath the chuckles; he can barely restrain his enthusiasm for the flowering of world mapping during the Renaissance, but for the parallel tradition of large scale city mapping he can barely summon any at all; he is enamored of the great topographers of the 19th century, but if he is even aware of the simultaneity of Robinson's great revolution of thematic cartography he doesn't bother to let us know. No more than he lets us understand that while all this is going on in Italy or Europe or Anglo-America, other, very different things are going on in South America and Africa and Inner Asia. The space of the world is reduced to a narrow corridor running from the Near East through Greece and Rome to North-west Europe and finally across the Atlantic to the center of the world – the United States. And he has the temerity to be titillated by the ethnocentrism of a Cosmas or a Richard of Haldingham!

This too bad because *The Mapmakers* could have been a good book, though in the end it is not really Wilford who must shoulder the blame but the history of cartography as a discipline. It has thrown up no models from which Wilford could have drawn anything resembling a history, and his failure makes all too certain the veracity of Blakemore and Harley's assertion that "there is no satisfactory *general* history of cartography."⁷ The need for this general history is paramount. Godlewska to the contrary notwithstanding it is precisely to the synthesizing texts that we must look for growth and change. Thirty years ago Brown noted that, "As it stands today, the literature on the history of map making consists of countless 'papers', monographs and longer studies ... written by persons who have had the time and energy to exhaust a minute point or a single chapter, but who have lacked either the time or the inclination to make a survey covering a period of more than five thousand years and involving the personalities and accomplishments of innumerable individuals from every conceivable walk of life."⁸ It is a complaint Wilford echoes in his own introduction, concluding that "the story of the mapmakers in its full historical sweep seems to have been neglected." We have Godlewska's "works of more limited scope based on primary research" in abundance. What we need is an encompassing historical vision. *The Mapmakers* just makes self-evident how desperate a need this is.

NOTES

¹ Anne Godlewska, review of *Maps and their makers*, by G.R. Crone, and *The story of maps*, by Lloyd Brown in *Cartographica*, vol. 18, no. 4, 1981: 115–17.

² *Ibid.*, p. 117.

³ Lloyd Brown, *The story of maps*. Boston: Little Brown and Co. Reprinted 1979. New York: Dover Publications; and 1980, London: Constable.

⁴ *Ibid.*, p. 10.

⁵ Northrop Frye, *Anatomy of criticism: four essays*. Princeton: University of Princeton Press, p. 187.

⁶ G.E.B. Saintsbury, "Romance", in *Encyclopaedia Britannica*. Chicago: Encyclopaedia Britannica Inc. 19: 426.

⁷ M.J. Blakemore and J.B. Harley, Concepts in the history of cartography: a review and perspective, *Cartographica*, vol. 17, no. 4, 1980: 15.

⁸ Brown, *The story of maps*, p. 4

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COMPUTER-ASSISTED CARTOGRAPHY: PRINCIPLES AND PROSPECTS / Mark S. Monmonier. Englewood Cliffs, N.J.: Prentice Hall, 1982. x, 214 p.: ill., maps. ISBN 0-13-165308-3: \$20.95 US.

Computer-Assisted Cartography: Principles and Prospects is the first text to deal exclusively with computer cartography, and it is a success despite certain shortcomings. The primary reason for its success is that the author, a well-respected scholar and authority in the field, seems to have accurately gauged the information needs of the cartographic community. Many cartographers and other map-using professionals have been exposed to computer cartography through 'canned' mapping programs. Advances in the field, however, have largely been due to those who have tempered their cartographic background with experience in other computer areas or moved into computer cartography from outside the range of traditional disciplines. The blending of backgrounds in computer science and cartography makes it possible for these individuals to state cartographic requirements in terms of workable, computer-assisted solutions. Further developments in the field and the successful, wide adaptation of computer methods will depend in large measure upon whether more cartographers opt to mix backgrounds so that they can articulate the requirements of cartographic production and, increasingly important, for map use.

The text synthesizes knowledge on the diverse topics relating to computer cartography in a well written and well organized manner. This synthesis allows novices to become better informed and provides professionals a cohesive overview of a rapidly changing field. Throughout the text, italicized key words and concepts are explained in the context of the discussion. This desirable attribute in a text fills a gap in the available literature on computer cartography; it helps break the vicious cycle of undefined terms that perpetuate 'buzz words.'

The text provides in the introductory chapter a cursory overview of hardware developments, but beyond this point, it appropriately emphasizes database and software development. Cartographers are less likely to lead in advancing hardware developments than they are to formulate large, spatial data sets and data management systems that will ensure that cartographic end products meet needs. In the author's own words, it is not "... a textbook on computer programming." Yet the book does provide a valuable understanding of many programming techniques and, more importantly, of underlying algorithms for many cartographic applications. A basic review of computer