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VIEWPOINT

# Cartography as Engagement

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When addressing at the question: '*What does Cartography mean to you?*' I reflected on my career in Cartography in order to properly provide an answer. At the very core of what it means to me is drawing the map and the very poetics of what we do to make maps 'work'.

However, it is more than the design and drawing (in its widest sense) of the map. It is the *engagement* in thinking about, developing and considering various design iterations and finally drawing the map. These process of problem-solving means that we need to think about the logics 'behind' the cartographic process, as well be attuned to what is actually feasible/possible for replicating and communicating the completed drawing, software, computer package or integrated media suite.

My time in cartography has taken me from the era of pen and ink, to photo-mechanical production, to the early days of computer-assisted cartography, to digital cartography to the application of DeskTop Publishing to map production, to multimedia, the Web, to mobile mapping and, now, to the era of ubiquitous map provision and collaboration in cartography.

When I started my career in cartography it was in the era of *pen and ink*. I worked for Shell Exploration as a cartographer. Here, the engagement with cartography was the design of a geologic or geophysical map, compiling information from (paper) resources, preparing the draughting film, constructing the grid, plotting the information from geologists fieldnotes (in pencil – probably a 5H, sharpened within an inch of its life with sandpaper), drawing lines with *Rotring* pens and adding lettering with *Wrico* lettering guides. Those hand-drawn lines and letters on plastic draughting film, once reproduced on a diazo printing machine, were used as tools to assist in making decisions about whether to embark on a costly geological exploration and drilling project. The engagement here was both a mental process (of map design – considering how all of the elements 'fitted' and accorded to geological mapping standards – and a tactile experience – actually handling the tools and making contact with the plastic draughting film, film cleaning pads, metal weights, Rotring pens and Wrico lettering guides, metal straight edges, erasers and razor blades. This engagement was rewarded through pleasure of completing a design, and drawing it by hand. The tactual experience of handling materials and manipulating tools resulted in a technical document that conveyed information from the geologist's field book to decision-makers.

Unfortunately, my experience with *scribing* did not quite cut it – in terms of engagement. I really couldn't become as engaged with the process of removing an emulsion from the top of stable plastics using a sapphire scribing tip. Yes, the process was accurate, produced standardized media and was quick, but the engagement was not the same as the tactual experience of actually drawing. The associated *photo-mechanical processes* were a bit different, especially when completing non-standard jobs. Manipulating images during the developing process was an art as well as a science, and techniques like warming parts of the photographic emulsion in certain areas of the film by hand to change the development process in that area produced some satisfying work outputs. I guess that there was more engagement with the photo-mechanical process. This was not so for me with scribing, perhaps due to the fact that what one could do with a drawing was more controlled.

The next era I was involved in was *computer-assisted cartography*. For me, engagement was greater at the beginning of this era than when the processes were further developed and matured. I had great satisfaction developing an algorithm and writing a computer program to control a plotter. Whilst trouble-shooting my code that just didn't work was frustrating during the process of developing the code, once it worked was a different matter. This engagement with making the code work, and therefore drawing the map with a machine was highly satisfying. For me the same engagement (and satisfaction) was not there with later systems that just required command lines to be entered.

The application of *Desk Top Publishing* to mapping changed all of that. Text composition and output could be done as one complete application. This was made possible by the introduction of two devices: the Apple Macintosh and the laser printer. The appearance of Desktop Publishing packages made every graphic artist a Cartographer, but, cartographers now had a tool that would enable them to 'draw' maps again, especially when a tablet and pen was

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added to the *Desk Top Publishing* tools. Equipped with a powerful microcomputer plus a scanner, plotter/printer and modem the individual becomes part of the distributed digital electronic mapping community. Non-cartographers produced a flood of 'crude' (from a design and consumption perspective) computer generated maps depicted everything about everywhere. Individual cartographers were able to produce maps as sophisticated as their corporate counterparts. However, cartographers were able to engage with these devices to produce cartographics. For me, engagement with the drawing returned and I was able to 'get my hands dirty' again.

*Multimedia mapping* changed the genre of the communication of geographical information. Multimedia cartography was different and the portrayal methods and viewing conditions expanded what cartography could do. It introduced an altogether different and more holistic approach to geographical information understanding and depiction than the previously used methods. Even maps produced by computers seemed to remain 'conventional' when compared to the products generated with multimedia authoring tools. The use of New Media, facilitated by interactive videodisc, Apple's *HyperCard* and later CD-ROM and DV-D, enhanced what was on offer from more 'conventional' methods and application software.

In my opinion, *Web cartography* was really a continuation of interactive multimedia mapping. By pairing a global communications system with a unique file transfer and viewing protocol, publishing, and cartographic publishing, became global, interactive and, later, inclusive. Here, engagement is with the development of mapping packages and with the international community of Web cartographers and citizens who volunteer their time and expertise to, well, make maps.

Cartographers become involved in the elements of cartography that they have both mastered (either academically or technically, or both) and that they also enjoy. Personal satisfaction in producing an elegant and aesthetically-pleasing design or mastering some scientific problem – both resulting in an as-near perfect a solution that is possible – can be a major part of what provides cartographers with motivational input that encourages further refinement of skills and better mastering of particular scientific problem-solving strategies that are unique to cartography. From the producer/consumer perspective, the need to produce a map that would serve a purpose, as well as mastering a technological skill, provides the motivation to complete a product that works (for them), but they could be uninterested in producing maps for anyone but themselves.

Currently, Web-delivered integrated media-facilitated maps are a focus for contemporary cartography. Considering that Cartography has been described in terms of science, art and technology, it is perhaps necessary to revisit the description in the light of new technologies now employed. Is cartography any different when delivered using new devices like consumer electronics? Does cartography need to be re-defined because of the revolution that has taken place with both the way in which information is communicated and the type of information that can be transferred, almost instantaneously, globally? Cartography is the fusing of science and art. However, in the light of the tremendous impact that information technology has had on the graphic arts in particular and thus on the possibilities for producing fairly professional products by non-cartographers, the area of responsibility for cartographers perhaps needs to be redefined as well. Consider that new technologies enables non-cartographers to produce maps, which can nevertheless be viewed as naive mapping products in the eyes of cartographers, as usable products (perhaps products that can be criticized for being inefficient or scientifically inaccurate or artistically inelegant), almost at the touch of a button. These can be developed and produced without a cartographer's input whatsoever, as long as the producer has access to data, which data providers are more than willing to make available to anyone who has the ability to pay.

Do cartographers view what they do differently, and do consumers of cartographic products influence the art/science/technology balance? Seeing that the development of integrated interactive cartographic media can be seen to have as much to do with making a movie as producing a scientific document [although the scientific integrity of all cartographic products is as important now as ever (perhaps more important because of the 'casual' appearance given by the immediate facade of contemporary mapping, before the 'shell of innocent art' is broken by further exploration)] the art components need to be considered as equal partners to the scientific counterparts. Technology may only be something that 'gets in the way' of properly exploiting contemporary media and naive users of this powerful amalgam of media types demonstrate this by their inability to appreciate and design the best application of the many media types available (and possible) in their rush to 'get their hands dirty' by cutting computer code.

The engagement in cartography now includes the professional cartographer and also the naive producer/consumer as well. Consider that cartographers can control most elements of the provision of products until the final consumption of the product. Perhaps a division needs to be made between the actual 'behind the scenes' elements of contemporary cartography – what the professional cartographer provides – the 'stuff' that makes contemporary mapping work – and the 'public face' of cartography – 'consumer cartography'.

Whatever the medium, whoever the map producer, the challenge and the pleasure associated with drawing and delivering the best map possible, using whichever medium is available or appropriate, and engaging with the cartographic process is what is important.

As well, and just as important in my career, has been engaging with fellow cartographers – nationally in Australia and internationally. Indeed, working with like-minded colleagues on growing the discipline of cartography and serving the cartographic community are the highlights of my career.

So – what cartography means to me is *engagement*. Engagement with the map, engagement with cartography, engagement with cartographers and engagement with the global cartographic community.

**BIOGRAPHICAL NOTES**

William Cartwright is Professor of Cartography in the School of Mathematical and Geospatial Sciences at RMIT University, Australia. He joined the University after spending a number of years in both the government and private sectors of the mapping industry. He is Chair of the Joint Board of Geospatial Information Societies and the Immediate Past-President of the International Cartographic Association. He is a Fellow of the Royal Geographical Society, a Fellow of the British Cartographic Society, an Honorary Fellow of the Mapping Sciences Institute Australia and an Honorary Fellow of the Surveying and Spatial Sciences Institute. He holds a Doctor of Philosophy from the University of Melbourne and a Doctor of Education from RMIT University. He has six other university qualifications – in the fields of cartography, applied science, education, media studies, information and communication technology and graphic design. He is the author of over 300 academic papers. His major research interest is the application of integrated media to cartography and the exploration of different metaphorical approaches to the depiction of geographical information. In 2013 he was made a Member of the Order of Australia for '*significant service to cartography and geospatial science as an academic, researcher and educator*'.