Cartography is Alive (Thank God!)

James R. Carter
Geography/Geology Department
Illinois State University

With the title *Cartography is Dead, (Thank God!)* Denis Wood certainly gets our attention (Wood, 2003). While he makes some interesting and relevant points much of what he proclaims misses the mark and does little to support the title. I proclaim that there was a misdiagnosis and that cartography is alive and well.

Wood equates cartography to map making and because he no longer sees a place for map design and production courses within the university, he states cartography is dead. I agree with his observation that many courses in map design and production have or will be phased out in the future and that few departments will replace their cartographers with someone in kind. But I see advanced graduates with solid training in cartography being hired and being in demand inside and outside academia. And, I see bachelor students who have completed courses in map design and production being hired because employers want their talents and skills.

Certainly, GIS in all of its dimensions is the technology of the moment and there is considerable demand to offer courses in this collection of technologies. In most university curricular processes courses can only be added by dropping other courses. So, it is not surprising that the more traditional techniques courses will be dropped for the more fashionable GIS courses. But cartography survives in part as a component of GIS for as Goodchild (2004, 301) noted: "As GIS has become more popular and widely adopted, more and more attention has been paid to its fundamentals, and there has been a resurgence of interest in such topics as cartography (and its generalization in GIS visualization), quantitative geography, and spatial statistics."

Cartography and GIS

While Goodchild considers cartography to be one of the fundamentals of GIS, Wood implies there is little role for cartography now because that functionality has been replaced by GIS. I was one of the early instructors in GIS and have watched cartography and GIS evolve. Cartography, maps and mapping are part of GIS, but only a part. While cartographers have much to contribute to GIS, many other disciplines do too because GIS is a convergence of many disciplines and technologies.

Two experiences come to mind to show a place for cartography in GIS. Years ago I managed a project to create a vegetation map of the Great Smoky Mountains National Park using classified Landsat data. When the lead researcher completed the classification for the entire Park I took the printed map to the plant ecologists for their first viewing. Their reaction was quite negative for they did not see the logic of the patterns on the map. As I watched their reaction I realized that the color scheme used on the map was not logical. I went back to the computer and generated a new color scheme using my experience as a cartographer. The ecologists immediately fell in love with the revised map because they could see the logic of the patterns. The only change to the map was my application of the cartographic touch in selecting better symbolization.

Recently I met with a group of colleagues to rank a number of sub-watersheds in a regional watershed. We were called upon to look at a number of variables presented to us on maps generated from a State of Illinois GIS system. On one map we questioned the patterns. I observed that all maps had been created using five classes broken into quantiles and that the top category grouped sub-watersheds of considerable differences. The operator of the GIS used the system to generate maps—period. When we looked at the numbers behind the maps we saw different patterns. As a cartographer I knew the processes of classifying data and it caught my attention. I had to explain the process to the others.

Ah, yes, the GIS technicians will make maps and will generate statistics and will classify remote sensing data. Gosh, if they can do this so easily why do we not get rid of statisticians and remote sensing specialists as well as the cartographers? Or, are those fundamental disciplines important in a GIS world? I think they are and cartography will continue to have an important niche in a GIS-dominated society.

Map Makers and Other Practitioners

In my thinking there are two foci, or communities, in GIS. One community is concerned with building and maintaining databases and using those databases for management and operations that have a spatial component to them. The other community is concerned with the development of a set of techniques to work with spatial data. With this concept of GIS I realized there are practitioners in many areas of study and analysis who perform tasks similar to those of the GIS world but who are not traditionally thought of as GIS workers. Included in these broad areas are the weather forecasting, marine exploration, navigation, and the petroleum exploration enterprises (Carter, 1989, 5). Since I first advanced this idea the GIS industry has made some expansion into these other areas of study and analysis.

When we look at these other areas we find many people making maps but they tend to do so outside of the traditional worlds of cartography and GIS. Consider the weather forecasting enterprise, which is charged to collect data from around the world, evaluate the data, aggregate it in central places, generate many maps and make forecasts, disseminate those maps and forecasts to regional and local persons who then create map presentations and announcements and get the word out to the public at large. All of this is done in near-real-time, 24/7. I argue that those many weather maps on television and in newspapers are the maps seen most often by the citizens of the world (Carter, 1998). Where are cartographers in this process? There are very few. The meteorologists have been able to create the concepts of weather and symbolize weather on maps at various levels of the atmosphere. They have created symbols to represent fronts and other weather phenomena and have done so without a cartographer present. In fact, Brewer (1997) recently observed that cartographers are now willing to accept color schemes used by the meteorologists.

The academic disciplines of geology, soil science and meteorology are heavy users of maps but I know of no cases where they have courses on how to make maps. Rather, they incorporate map making and map use into the content of many of their substantive courses. Map making and map use are inherent in any weather forecasting course. It is common in geology to have a multi-week field course incorporating geologic mapping. And, now, many students in geology and soil science are likely to take GIS instruction and as such probably get more exposure to cartography then they did before. Indeed, many people have been making maps

in their disciplines without much direct involvement in cartography for decades.

Professional Cartography and Map Making

In his first paragraph Wood states that "mapmaking is freeing itself from the dead hand of academia." He goes on to talk about our failed attempts to make mapmaking a profession. Then he looks at how many people attend an ESRI Users Conference compared to how many people attend a NACIS Conference. By golly, there are many people out there making maps and they do not call themselves cartographers or geographers. But, in my mind this does not demonstrate that 'Cartography is Dead.'

Two decades ago I was more active in ACSM and headed the Education Committee. In those roles I was concerned about setting standards and the direction of cartography as it jockeyed for its place in the mix of mapping sciences. GIS was emerging and I was part of that move, but I still thought of myself as a cartographer. Then a student asked me what he needed to do to become a cartographer. I responded ". . . all any student needs to do is get enough education and/or experience to think of himself or herself as a cartographer and then to convince others that he or she is qualified to be a cartographer. After all, that is the way the rest of us have become cartographers" (Carter, 1987, 23).

Indeed, I still feel this way, which seems to be consistent with Wood's arguments. I went on to consider what I expect in someone who I would be willing to call a professional cartographer. I contended that to be a professional cartographer one should have good working knowledge of: the use of maps; sources of maps and map information; interpretation of maps; construction of maps; production of maps; the issues of accessing, storage, and preservation of maps; and the institutions and literature related to cartography (ibid., 24).

I do not expect a professional cartographer to be a master of all of these topics, but each professional worthy of the title should know enough about each topic to know what they know and what they do not know. When a professional does not know something relevant to the profession, I expect that person to have an idea of where to go to get an answer.

What does it take to become a cartographer, professional or not? We are one of those professions which do not require specific credentials to bear the title 'professional'. In that regard we are similar to economists, historians, mathematicians, and philosophers. A few disciplines license some of their professionals, such as architects and engineers although there are many practitioners of these professions who are professionals but cannot use the title formally. In other cases, the state licenses practitioners, such as physicians, surveyors, cosmetologists and barbers. Some disciplines certify their practitioners, such as accountants, geologists, photogrammetrists, consulting meteorologists and television weathercasters. Two decades ago I considered the benefits of a formal certification program for cartographers but for many reasons concluded it was not worth the effort (Carter, 1985). Some academic GIS programs are now certifying their students so that they appear to have met some standard. As a cartographer I am content to be in the same camp with the economists, historians, mathematicians and philosophers than with the physicians, surveyors, barbers and cosmetologists.

Just because one does not have to take one or more specific courses in cartography to become a cartographer does not mean there should be no courses in cartography. I note that my University has courses in creative

writing, legal writing and technical writing but I know that great numbers persons are successful writers who have never had such courses. And, I am certain some persons who have completed these courses write some real garbage. So, completing a writing course is neither a prerequisite to, nor a guarantee of, becoming a writer. The story is similar for other creative activities such as acting and performance.

Wood notes that many people who were not trained in cartography courses in geography departments have made contributions to cartography or have produced significant maps. So, what else is new and how does this make us any different from other fields of study? I think back to my undergraduate days when I took a course under Dr. Kenneth P. Williams, the award winning author of the multiple-volume series *Lincoln Finds a General*. Dr. Williams was my calculus professor. I am certain many historians were envious that a mathematician wrote more award winning history than they did. And, there are many successful business leaders and politicians who did not study economics, management or political science but they are very good at practicing economics, management and politics.

Wood not only gloats that non-cartographers make significant maps, he also contends our profession has no power. Wood looks at the case of the opposition to the Peters map and the great effort to ban rectangular map projections of the world. He states that the resolution we circulated (which I probably signed) "had no effect—its laughable lack of effect—demonstrated to one and all how little authority the profession had" (Wood, 2003, 6). Gosh, that is news to me. While watching news or looking at press briefings on television I frequently reflect back that a few years ago the background map in these environments was the Mercator projection. Today, I seldom see the Mercator projection at those public sites. I have always thought we had some impact.

Our Birthrights to Maps and Mapping

I think Wood makes an interesting observation when he says we have a birthright to make maps…"when it comes to mapmaking there are no outsiders, no more than there are outsiders when it comes to speaking or writing English. These are birthrights of the members of our society, who acquire the ability to speak and make maps as they grow up in it. Speaking and mapmaking are not like open-heart surgery or professional basketball, which do require specialized training and years of practice. You can't just step into the shoes of an NBA player and expect to score. You can't just claw your way into your friend's chest and repair her heart no matter how insistently her situation calls for it. But when a communication situation calls for speaking or making a map, you can just open your mouth (or attack the keyboard) or pick up your pen (or your mouse)" Wood, 2003, 6).

While I agree with some of the above, I would like to rewrite it as: Everyone has a birthright to think for himself or herself and participate in those activities that appeal to them, with some constraints. As such we should be able to speak, write and make maps. And, we should be able to select our own diets and medications and we have an obligation to look out for the healthfulness of our loved ones and the environment around us. And, we can play and participate in individual and organized sports, be that walking, golf or basketball. Great numbers of people function well in society by speaking up, taking care of their own health, making maps and playing sports. We acknowledge that some people excel in one or more of these practices. When we look at who excels we find that the prac-

titioners have some innate talent, have dedicated themselves to the task and have put in a lot of work and practice to hone their skills.

Many thoughts flit through my mind when I think further on his statement about speaking, map making, NBA basketball and heart surgery. While everyone can speak, many people want to improve on their speaking abilities and thus we find organizations like Toastmasters International, whose mission states: "Through its member Clubs, Toastmasters International helps men and women learn the arts of speaking, listening and thinking—vital skills that promote self-actualization, enhance leadership, foster human understanding, and contribute to the betterment of mankind" (Toastmasters, 2004). So, if those choosing to exercise their birthright to speak feel the need to gather together to help themselves be better speakers, I propose that we facilitate the formation of "Toastmappers", where everyone who wants to make and use more effective maps will gather together weekly to help each other to "foster human understanding, and contribute to the betterment of mankind" (ibid.).

How much experience and training does it take to become an NBA star? We don't know how young stars could be because they are not allowed to be drafted into the NBA until they graduate from high school. And years of experience do not count as much as size, speed, coordination and the ability of the body to take the wear and tear of this physical sport.

There are many alternatives in the practice of medicine but I will concede that only those with requisite training can practice open-heart surgery. But then I think of an uncle who at 88 was talked into by-pass surgery against the advice of his regular physician and family. He never regained consciousness and died six weeks after the operation. I suspect the surgeon took him apart and put him back together by the book but the end result was not effective. As I write this, there are news reports about surgical teams being forced to implement procedures to make certain the operations are performed as designed. It seems that too often surgeons cut off the wrong limb or operate on the wrong person. Although the patients might not appreciate it, those surgeons are licensed professionals.

Concluding Comments

I see a surgery analogy in the Denis Wood essay—he has attempted to operate on the discipline of cartography by slicing and dicing the organism into little pieces, but he did not try to put it back together. If we were a licensed profession we could refer his essay to a review committee to consider disciplinary action against the author. Instead we can ignore what he said, argue with him, or mull over his words to separate the insightful from the misguided. The choice is ours.

I am concerned that this debate will be taken outside the realm of cartography. I hope administrators who are looking for a place to cut to save money or to promote another program do not see this title because it is my contention that it is not appropriate and should not have been used. And, many of those administrators might never go beyond the title.

There is some food for thought in some of what Wood has to say, scattered among reckless and accusatory charges. His foundation for this essay is that courses in cartography exist only to teach people how to make maps for the rest of the world who cannot make maps. I hope I have been able to counter that argument for a more positive and useful perspective on our profession. I am still proud to call myself a cartographer.

REFERENCES

Brewer, C. A., 1997. Spectral Schemes: Controversial Color Use of Maps, *Cartography and Geographic Information Systems*, 24(4) 203-220.

Carter, J. R., 1985. Curricula Standards, Certification, and other Possibilities in Cartographic Education, *Technical Proceedings of the American Congress on Surveying and Mapping, 45th Annual Meeting*, 2-7.

Carter, J. R., 1987. Defining Cartography as a Profession, *Bulletin, American Congress on Surveying and Mapping*, 109, 23-26.

Carter, J. R., 1989. On Defining the Geographic Information System," in *Fundamentals of Geographic Information Systems: A Compendium*, (ed.) Ripple, W. J., Bethesda, MD: American Society for Photogrammetry and Remote Sensing and the American Congress on Surveying and Mapping, 3-7.

Carter, J. R., 1998. Uses, Users, and Use Environments of Television Maps, *Cartographic Perspectives*, 30, 18-37.

Goodchild, M. F., 2004. The Validity and Usefulness of Laws in Geographic Information Science and Geography*, Annals of the Association of American Geographers*, 94(2) 300-303.

Toastmasters International, 2004, as of July 7, 2004, http://www.toastmasters.org/mission.asp

Williams, K. P., 1949 – 1959. *Lincoln Finds a General*. New York: Mcmillan, 5 volumes.

Wood, D., 2003. Cartography is Dead (Thank God!), *Cartographic Perspectives*, 45, 4-7.

Dr. Jim Carter is Professor, Geography-Geology Department, Illinois State University, Normal, IL USA. He has been Associate Director of the Computing Center at the University of Tennessee, Knoxville, and Director of Academic Computing, Illinois State University. He was a founding member of the Illinois GIS Association and its President. He served two terms as Chair of the Map Use Commission of the International Cartographic Association. He edited Volume 28 of Cartographic Perspectives, on map use.

I want to thank Dr. Judy Olson for reading and commenting on a draft of this column.