

## featured article

The problem of defining and actualizing standards of ethical conduct troubles many professions, including cartography. In an attempt to formalize the ethical discourse in cartography the editors of *Cartographic Perspectives* invited five contributors to discuss what they perceive as important ethical problems in the discipline. The contributors were selected from the three major sectors of the cartographic enterprise: commercial mapping organizations, government mapping agencies, and university geography departments offering cartography programs. The contributors identify personal and institutional vigilance in product quality assurance, map plagiarism through violation of copyright law, and conflicts of interest as important ethical issues.

The commentary concludes by questioning the nature and validity of cartography's claim to truth ("accuracy"), and asserts that cartographic ethics cannot be extricated from the values of the larger society which commissions the production of cartographic information.

Cartography, as a discipline, has begun to pay an increasing amount of attention to ethical issues. Panel discussions devoted to ethics held at the annual meetings of the Association of American Geographers (AAG) and the North American Cartographic Information Society (NACIS) attest to this trend. Published discussions of ethical issues arising as a result of the adoption of GIS and computer assisted cartography include Dangermond and Smith (1988), Visvalingam (1989) and Dutton (1978). These examples point to an emerging discourse on ethics in cartography. We hope that this paper will further the discourse by providing a diverse collection of perspectives on ethical problems in the field and a tentative synthesis of their implications. As a working definition for the purposes of this discussion, we define ethics as "principles of conduct guiding the practices of an individual or professional group."

Cartographers may be required to interact professionally in a number of institutional/organizational milieus. The body of this article is comprised of three sections dealing with ethical problems within the commercial, government, and academic sectors of cartography. Our purpose will be to discuss a range of ethical problems which may develop from the normal practice of cartographers/information specialists in these three domains. A discussion of ethical problems in commercial cartography is contributed by Dobson. Two anonymous cartographers employed by a federal mapping agency address ethical problems in government cartography. Andrews considers ethical problems in academic cartography. Contributing authors were invited to present specific or hypothetical examples to illustrate the conditions which may lead to ethical dilemmas and to suggest strategies for their resolution. Impending ethical problems which may arise as a result of technological or broader societal changes are also discussed. The commentary concludes with McHaffie's summary and synthesis of the fundamental ethical problems faced by cartographers in these three sectors.

\*These contributors were required by the terms of their employment contracts to seek the permission of agency superiors before publishing this paper. Permission was not granted (i.e., the paper was censored in its entirety). The authors have therefore consented to publishing their contribution anonymously. Their statements, therefore, should not be construed as representing the opinions of a major federal mapping agency, but rather those of two concerned private citizens.

## Ethical Problems in Cartography

a roundtable  
commentary

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*Two anonymous employees of a  
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Ethical Problems in  
Commercial Cartography

Michael Dobson

*I prefer to think of "ethical problems" as a working example of scruples and would be very comfortable if all cartographers were scrupulous sorts who paid careful attention to details and attempted to make products that were precise, accurate, and exact.*

Although there are various definitions of ethics (indeed, one is provided by my colleague who wrote the introduction to this article) I feel most comfortable by assuming that an ethical cartographer is one whose products reflect the fact that the cartographer's activities during the map making process conformed to the standards of conduct of our profession. While that may sound very thoughtful, I am forced to admit that my undergraduate, graduate, and professional training in cartography did not include issues such as ethics. Further, I would be hard pressed to produce any document that clearly or unambiguously defines the standards of conduct of our profession, or perhaps, one that I could agree with on such definition.

In fact, I prefer to think of "ethical problems" as a working example of **scruples** and would be very comfortable if all cartographers were scrupulous sorts who paid careful attention to details and attempted to make products that were precise, accurate, and exact. I spent much of my teaching career attempting to convey to introductory cartography students the fact that maps are "generalizations" and that the appropriate cartographic processes do not necessarily produce results that are "right" as much as they help eliminate those that result in products that are "not quite right." In addition, it is my opinion that most of the substandard cartographic products are the result of individuals who have not been properly trained and not the work of individuals who are consciously trying to mislead their audience. It is in this sense that I couch my thoughts on ethical issues in commercial cartography.

Commercial cartography is an interesting term. The range of commercial operations includes both the one-man or -woman shop and operations consisting of several hundred cartographers and the accompanying layers of cartographic management, not to mention marketing and sales staffs of several hundred individuals. As a consequence product development issues and the related issue of scrupulous behavior may range from an individual decision in the former case to team decision making in the latter case. The very nature of complex business structures (i.e. the division of responsibilities for certain functions) mandates that the product development process can be guided by the scruples of the corporate culture. Such structures cannot guarantee, however, that someone in one area of product responsibility will not make a decision that makes earlier decisions about product content less than appropriate. To be blunt, substandard products produced by large corporations are most frequently the result of inadequate communication on the part of marketing and sales personnel who are, in the main, unfamiliar with the cartographic process or the intricacies of cartographic production. Conversely, substandard products produced by "basement shops" most often reflect a lack of funds, rather than a real intent to mislead the customer. I suppose many may think that I have just painted a whitewash over commercial operations. There is, however, one indisputable fact about commercial operations: we exist to sell our maps to consumers. If we do a substandard job, they will respond by not buying our products and we will no longer be a viable commercial enterprise. Simply put, it is not in our best interests to be anything less than scrupulous in our cartographic activities, and we are extremely vigilant in the pursuit of ethical behavior.

It is true, however, that every corporation has its own unique culture, and I can only represent the culture that exists at Rand McNally. We spend a tremendous amount of money on quality control and quality assurance. Further, I spend considerable time with my team stressing excellence and working to improve those areas of our operations that are "not quite right." Perhaps more to the point, I have terminated the

employment of employees who do not aspire to the standards that we have set and thus have set a high penalty for those personnel who do not actively support our goal of excellence in product.

In my opinion, the single greatest ethical problem in our industry is one in which large commercial cartographers are victims rather than perpetrators: copyright infringement. You know, like the section of some atlas that you used as a base for one of your projects, or the road map that you xeroxed and handed out to direct people to your conference. Or perhaps maps that are used as the backgrounds in advertisements, or a recent recording artist that put a Rand McNally map on an album cover but did not request a licensing agreement. These examples pale in comparison to a number of cases where someone has simply photographed or color separated one of our maps, put their cover on it and then sold it as their product. If I could come back in another life, I would choose to come back as a copyright lawyer specializing in print products.

I suspect that the problem of copyright infringement will become one of the most significant issues related to the implementation of geographic information systems. After all, how many of you have not digitized a map copyrighted by a commercial publisher? Copyright law gives the copyright holder specific rights in respect to the product, and it is clearly the case that the copyright holder possesses the rights to derivative products and presentations (read that to mean "pick up a 'go to jail' card" if you digitize the original product). Similarly, suppose that you refer to a commercial source that is copyrighted in order to resolve an ambiguity found in a file. Copyright law precludes you from utilizing that sole source unless you seek and receive permission from that publisher (how often have you written for such permission?). Ah, but I am beating a dead horse since everybody (except commercial operations) digitizes copyrighted sources. Is it fair to conclude, then, that this common practice constitutes a principle of conduct guiding the profession and is thus one of cartography's ethical codes?

Finally, I urge you and your colleagues to continue examining the ethics issue. It is an initiative of the greatest importance to our future success as a profession.

The high volume of mapping and charting activity over the past thirty years, combined with the new technology, declining resources, and a volatile legal climate have indeed led to an ethical crisis in government mapping. It is sometimes difficult to do the "intellectually honest and correct" thing with the pressures being exerted on employees at local, state, and federal levels. Robinson (1984) stated the solution while describing the problem: "just as basic as the quality of the data is . . . the scholarly completeness and intellectual honesty of the cartographer."

The ultimate solution to ethical problems is the individual and his/her standards and values. No matter what the pressure is to produce products that are not conveying the "correct intellectual meaning" nor implying a greater impression of completeness, accuracy and reliability than is warranted, we as cartographers must resist and exert our own personal values and ethical conscience to ensure that products live up to industry and government standards.

The only way government or public cartographers will resolve the ethical crisis is, as individuals, to examine ourselves and:

- § Be sure of having our own ethical guidelines and standards in order
- § Be able to distinguish between ethical and legal actions (don't

*If I could come back in another life, I would choose to come back as a copyright lawyer specializing in print products.*

#### **Ethical Problems in Government Cartography**

*Two anonymous employees of a federal mapping agency*

*If we want to serve the public well and not be at odds with our inner drives, our objective and subjective responsibilities must be closely aligned.*

assume the latter implies the former)

- § Continue to make ethical judgments and act in the public interest
- § Avoid being in any sort of conflict of interest situation
- § Continuously evaluate our own judgments using an ethical framework for decision making

It is important that we have an understanding of the delicate balance between "objective" and "subjective" responsibility. Objective responsibility is an obligation to someone else or to an organization for a particular standard or category of performance (acting in the public interest); subjective responsibility derives from personal experiences, beliefs and values which lead us to act in accordance with our "inner drives" (conscience). If we want to serve the public well and not be at odds with our inner drives, our objective and subjective responsibilities must be closely aligned. Cooper (1938) defines the ethical process as the means by which these internal sources of responsibility are related to external demands. As cartographers in the public sector, we need to remember that we serve the public and should always act in the public interest (external demand) with a clear conscience (internal demand). This has become a dilemma for some, resulting in such serious problems as:

- § Continual product liability cases where the government is sued because it has the "deepest pocket" — not because it erred in product design or produced a defective product
- § Budget cutbacks in the face of mounting pressures to produce more, or to produce the status quo with fewer resources. This trend towards cutting corners and costs has reached the point where some cartographers may be tempted to turn out substandard products
- § Automation of activities that are not technically or economically feasible at this time with an attendant loss of funds and/or the failure to produce timely or acceptable charts or maps

Mention any of these in a gathering of public sector cartographers and a lively discussion of ethical issues will follow. Resolution or the best possible approach to minimizing the effects of such problems involves individual cartographers in each government agency acting in an ethically responsible manner and not yielding to the various "external pressures."

Where the question of product liability is concerned, we urge cartographers to ensure that solid standards are documented and put in place before a product is produced. If standards exist, and work performed and products produced meet tests for accuracy and authenticity, then litigants are not going to have an easy time of it. Go to court and exercise your rights — don't allow yourself to be browbeaten by the legal system! Remember that the decision to sue is not made on whether the plaintiff is "right" or "wrong" but on whether the "expected benefits of winning exceed the possible costs of losing" (Bradley 1983; McLauchlan 1977). This is a sad commentary but true. In short, fight if your design and product meet standards — don't compromise your values.

As stated, budget cutbacks are creating pressures to cut corners and costs on product lines. If these cuts can be taken through better methodology, technology, or less expensive materials without producing a substandard product, then we should take the cuts as good public servants. However, if the cuts do lead to substandard products with attendant liability and quality problems, then we should exercise our ethical responsibility. We have a duty to recommend restoration of funding to adequate levels or propose a halt to production. This takes intestinal fortitude but

allows us to exercise our prerogatives in serving the public interest.

Premature attempts to automate cartographic procedures before new technologies are adequately evolved is also a major problem in government circles. In many cases substantial financial losses have been incurred. In addition to the economic drain, some charts or maps that the public has funded the government to produce have been only partially delivered, delivered in substandard condition, or not delivered at all. We as public sector cartographers have a moral and ethical responsibility to stop these losses. How can we do this?

- § Perform brief but authoritative cost analyses and technical feasibility studies
- § Run benchmark studies or cases, if possible, to verify costs, timing and technical performance
- § Check vendor performance by talking to previous customers (even if their applications are slightly different)
- § If systems are to be procured and installed, run in parallel with current manual or automated system to ensure comparable results
- § If the new system is a partial or total failure, report it immediately to management. If they fail to take action, write to the Inspector General or your agency equivalent. How many times have we seen systems fail and more of the same equipment and software installed because no one intervened?

These are just a few of the many problems facing cartographers today in the public sector. The solution to these and other issues involves each and every one of us meeting his or her ethical responsibility in cartographic production.

Let me state from the onset that it is difficult to get a clear picture of how teachers of cartography define ethics; how they address ethical issues either through their lectures, exercise requirements, or grading; or even if they consider this topic to be an important or integral part of their role as an educator. Some ideas on cartographic ethics have been exchanged at professional meetings. This discourse has been diverse and at times controversial. Different points of view about ethics and what constitutes ethical conduct have arisen. This is partly because of the nature of how different individuals and groups view the role of cartographers and the role of maps,<sup>1</sup> and also because there are questions if cartography and cartographers really face any ethical issues.

Academic cartographers have been part of these discussions and they are beginning to form opinions, examine and debate old epistemologies and ideas, and view ethical conduct in new and critical ways. As cartography teachers we are confronted with all aspects of ethical questions regarding maps. The concepts put forth in this section are an attempt to formalize some ideas on the ethics of teaching cartography in order to begin an active debate on if and how we as educators should address these issues in the classroom. I will cite what I believe to be a few problems we are confronted with in teaching cartography and training future map makers and users. Along with these opinions I offer some examples of how we might make students aware of ethical issues and concerns surrounding maps. I have purposely avoided discussion of the ethics of mapping practices as they relate to metrical standards and accuracy, although I think these topics are important.

If we take the definition of ethics offered at the beginning of this article

#### **Ethical Problems in Academic Cartography** *Sona Karentz Andrews*

*In many cases students are given the false impression that cartography is a science, based on objective principles and criterion.*

(the principles of conduct guiding the practices of an individual or professional group) we can see that our cartography journals and textbooks are full of map making suggestions, guidelines, and conventions. There are guidelines based on empirical (and sometimes not so empirical) research for just about every element contained on a map; from symbolization, to lettering size, design hierarchies, and so on. These are usually presented via a set of decisions the cartographer makes about a particular map element and its relation to prior and subsequent decisions about other elements.

The majority of information we impart to students through these examples has little to do with ethics. Recommendations on what line widths or what lettering sizes are harmonious or discriminate from one another are perceptual and aesthetic issues, not ethical ones. Suggestions on title placement is a design issue, not an ethical one. Conventions on coloring a forested area green, or a water body blue are iconicity issues, not ethical ones. I do not want to even remotely imply that this type of information is not useful to the cartographer. It is. It is most reassuring to the novice cartography student who is faced with a multitude of decisions that seem overwhelming at the start. But our cartography textbooks provide very little information on ethical conduct. These books do address map accuracy, data, and data source reliability, topics which by definition to some constitute one aspect of ethical conduct; however, I think the approach taken even on these topics is misleading to students.

In many cases students are given the false impression that cartography is a science, based on objective principles and criterion. The cartographer's role is schematicized as one of transmitting knowledge and facts; of taking realms and realities and generalizing them; and of forming a message. For example, Dent refers to maps as "a vehicle for the transmission of knowledge" (Dent 1990, 5), Robinson, Sale, Morrison, and Muehrcke as "a storage medium for spatially ordered information" (Robinson, et al 1984, 12), and Campbell as "a retrieval system for spatial information" (Campbell 1984, 2). It is important to note that these phrases have been taken somewhat out of context. All of these authors acknowledge the complexity of the mapping process and define maps in much broader terms than quoted here. They also discuss the personal influence the cartographer has on the map, but I fear that what is synthesized out of this by many students (and some teachers of cartography) are sets of structured mapping principles that lead them to believe that maps are mirrors of reality, and the cartographer's role is to accurately depict this information through a set of objective decisions and processes.

This is where I think cartography instructors have a huge responsibility to tell and show students that maps are very subjective forms of expression. The cartographer is not performing a set of routine operations that always result in a true and accurate picture of the world. We need to let students know that there is not one solution or one way to say something. They need to know that maps can, do, and should reflect biases.

One technique that can be used to do this is to give students an exercise where each of them is required to create a wide variety of maps with different meanings and messages from the same set of data. The instructions for the exercise are short paragraph descriptions of one or two cartographic principles or conventions dealing with symbology, generalization, or categorization for each map in the exercise. One map, for example, conveys general patterns and contrasts by having students categorize data into three area-shaded classes. Seven area-shaded classes are used on the subsequent map. Another map uses evenly distributed point symbols. Another map has the shading scheme inversely related to

the values in the data set. In all, have them make about twenty or so different simple colored pencil or computer generated maps using a variety of graphic, linguistic, and iconic symbols. When they are done with the exercise they will have firsthand experience that demonstrates how appearances and meaning are structured by the cartographer and how resulting map images all represent something about the data, but from different viewpoints, different levels of detail, and different emphases. Having done this exercise, some students still ask "Which viewpoint is right? Which one is the best one? Which one is the most accurate one?" It is important to convey to students that the answers to these could be "all of them, some of them, none of them."

That what they need to do for each mapping situation and problem is to think about what they are going to say and how they plan to say it. Although it is risky to make map and text analogies too superfluously in the classroom, it is sometimes useful to remind them that the map maker is like the story teller, and the way the information is structured and told is their responsibility.

As cartography teachers we should try not to have such rigid restrictions on mapping exercises. These only help mislead students further into thinking there is only one way to depict a particular set of data, only one color scheme to use, only one scale to map it at. They need to learn to be independent thinkers, guided by their own ethical standards. The kinds of questions we should teach them to ask are "what are the consequences of what I have mapped? How do the decisions I make influence the decisions made by others? What is my role in shaping the image?" By asking these questions students learn that maps are very powerful tools and have tremendous influence on how people make decisions and form impressions of things.

Cartography instructors should also take the responsibility of teaching their students about the ethical issues involving map copyright. This information should be presented clearly to students in order for them to realize the importance of this issue, the ramifications of copyright violations, and the unethical practice of map plagiarism. It is useful to draw analogies to the plagiarism of written information, but even these examples need clarification since some students do not fully realize what constitutes plagiarism of written material, let alone maps. Students need to be told that copying a map (or part of it) is illegal. This pertains not only to making a reproduction of a map, but also to copying stylized features and design. In many cases one only need write to the copyright holder to obtain permission to copy all or part of a map. The exception to this are maps produced by the United States government and some state agencies. These maps are considered in the Public Domain and are not copyrighted. The copyright exception also generally covers outline maps (unless highly stylized), but students need to be careful here because the limitations in this area are vague at best.

Students should know that lawsuits have been filed and map copyright violators have been fined for their inappropriate copying of another's work or product. Cartography instructors can provide their students with a brochure prepared by the International Map Dealer's Association on copyright information.<sup>2</sup> The brochure answers many questions that students have, while also stressing the importance of this ethical issue in cartography.

Technology has introduced new dimensions to ethical issues in the area of map copyrights. We can now quickly and inexpensively scan a map image onto our computer screens and into our map files and use it to generate other maps. How the copyright laws will deal with this form of

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plagiarism will greatly affect some of the ways this technology is applied to desktop mapping, and it will be important for us to keep our students abreast of these developments.

Technology has fostered other ethical concerns in cartography in the areas of automated cartography and GIS. The introduction of the article refers to some of the literature in this area (Dangermond and Smith 1988, for example). Articles like these provide an excellent forum for classroom discussion and debate on how data is collected, categorized, inventoried, displayed and used in an automated environment.

We should make students aware of all these ethical issues; however, the cartographic ethic our students develop once they are responsible for making and using mapped information is very much out of our control. The standards they adopt and/or accept are set individually; by groups, agencies, and governments; and cultures and societies. What we should teach them is that maps are powerful ways of communicating information.

### Synthesis and Summary

*Patrick McHaffie*

Being the last to comment in a discussion of this type is quite a luxury. I hope I can avoid being accused of favoring one position over the other; however, given the subjective nature of ethical positions and indeed knowledge in general, any pretense at impartiality will more than likely be obvious.

These commentaries are a striking illustration of at least three characteristics of ethical discourse in cartography. First, they illustrate well the very different concerns of cartographers/cartographic information specialists in the three major sectors of commercial, government, and academic cartography. The commercial sector of Dobson, first and foremost, is concerned with the quality of the product, however quality may be defined by "market pressures." Government cartographers are concerned with product quality as well, but the perspective of our anonymous government cartographers is one which allows more freedom for the cartographer to act in response to "external pressures" without the strict requirement of corporate loyalty to product standards (not to mention the employment contract). Academic cartography, as characterized by Andrews, is essentially concerned with balancing a sound foundation for students in the techniques peculiar to cartography with a respect for the subjective nature of maps as information and the claims to truth which can be made from them.

Second, the discussion illustrates the personal, individual nature of ethical questions, even within the three major sectors. I doubt that any cartographer/cartographic information specialist could wholeheartedly endorse any of these positions without reservation. Each, in its own way, reflects the subjective predilections of the author(s) derived from their experience within a particular professional environment. But, rather than invalidate the respective arguments, these viewpoints make this discussion all the richer, and at the same time reveal much about the nature of ethical discourse. I believe we must at once hold firmly to the principles which we revere, whether derived from experience or our particular professional situation, and admit that there may be others which are equally as valid given the wide range of personal/professional circumstances encountered by individuals within the three major sectors.

Third, there are obviously common themes running through this group commentary. The nature and validity of cartography's claim to truth is the overriding concern which is always present in each of these commentaries. This concern is expressed by Dobson most obviously in his use of

quotations around phrases like "right" and "not quite right." This perhaps reflects an apprehension and a certain amount of reticence about the use of such subjective terms in referring to cartographic products. His later discussion of copyright law and its abuse in cartography (apparently only within the government and academic sectors) raises related questions regarding plagiarism, honesty, and ownership. These are addressed later by Andrews in a call for increased instruction for cartography students on copyright restrictions.

The anonymous contributors feel it is the responsibility of the individual to ensure that maps reflect a "correct" intellectual meaning. The meaning of "correct" in this instance is assumed to reflect some pre-established public or private standard of accuracy, precision, or fidelity. The "rightness" of a particular piece of information suggests a broader, more value-laden conception reflecting the "justness" or "fairness" of the map. However, as Andrews states, a concern with correctness or rightness only reflects one aspect of the ethical debate, one addressed mainly in technical/scientific discourse rather than personal/professional ethical debate. Obviously, the gap between what is "correct" and what is "right" can sometimes lead to unavoidable conflicts of interest, conflicts whose resolution apparently lies somewhere between an individual's "subjective" and "objective" responsibilities.

Each contributor placed a high priority on the role of new technology, GIS and computer-assisted cartography, in defining new ethical agendas for cartographers/information specialists. The individual emphases were different, however. Both Dobson and Andrews feel that GIS will be the new terrain where questions of map copyright will be contested. The concern of the anonymous contributors, however, centered on the appropriate or inappropriate application of these technologies in relation to public cost. Interestingly, none of the contributors addressed the interface between GIS and remote sensing and the unresolved questions of surveillance and privacy which arise therefrom.

A recent PBS radio program heralded an increased interest in ethical issues in both the public and private sectors. Does this increased interest in ethics signal a more ethical society? No, actually most ethicists agree that society is no more ethical than it was in the past (as if anyone could measure something as nebulous as societal ethics). Instead the individual is faced now with complex and difficult choices in all areas including professional life. Recent widespread concern over ethical issues reflects the realization of the enigmatic character of many of these choices which we are forced to make. Perhaps, then, the reason we as cartographers and cartographic information specialists are paying more attention to ethical issues is a reflection of a larger trend, something outside the bounds of government, academic, and private sector cartography. In fact, if we consider the nature of what we do and its embeddedness within the larger society, it is difficult to imagine how cartographers can create ethical standards which do not in some way refer to values created outside the discipline. For example, government cartographers create maps — cartographic information — as a part of a larger state apparatus. This information is produced as a response to the needs of the state, needs defined through some sort of rationalized decision-making process. So the rationale for the production of the product is imposed upon the government cartographer/information specialist from outside the discipline. A similar example could be drawn for the private sector cartographer who is not involved as either an owner or manager. Academic cartographers may feel compelled to structure their curricula in response to the perceived needs of students preparing to enter a competitive

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employment market in which the largest number of opportunities has historically been provided, directly and indirectly, by the defense industry. All this is only to illustrate the difficulty of separating the activity we pursue from the larger society around us.

Cartographers have worked to produce more precise and accurate maps and map accuracy standards reflect the concern which we have paid to questions of our product's fidelity. True ethical questions are much broader than mere questions of accuracy and precision. Accuracy standards, when considered generally, are indistinguishable from other claims to truth made by similar disciplines involved in the production of information such as surveyors, engineers, and photogrammetrists. In other words cartographers, as a discipline, cannot produce ethical standards which do not in some way reflect the general standards of conduct of the larger society. So it is important to remember that any true consideration of cartographic ethics must be made with the understanding that we are after all an important but small subset of a larger community with common individual and shared responsibilities. ☐

## NOTES

1. Robinson, et al. (1984, #11) discuss some of these conflicts in writing about the complexity of cartography. Their "five focuses of attention" — the *geometric* (emphasizing metrical accuracy of cartography), the *technologic* (emphasizing technical innovation in map preparation), the *artistic* (emphasizing creative expression), the *presentation* (emphasizing map design), and the *communication* (emphasizing the map's ability to provide meaning) — might be a useful framework for future ethics discussions.

2. A copy of this publication can be obtained by writing or calling the International Map Dealer's Association, P.O. Box 1789, Kankakee, IL 60901, phone (815) 939-3509. Additional copies can be purchased at a nominal fee.

## REFERENCES

- Bradley, M. D. The Scientist and Engineer in Court, *American Geophysical Journal*. Washington, DC
- Campbell, J. (1984) *Introductory Cartography*. Englewood Cliffs, NJ: Prentice-Hall.
- Cooper, T. L. (1986) *The Responsible Administrator*. Port Washington, NY: Associated Faculty Press, Inc.
- Dangermond, J., and L.K. Smith, (1988) Geographic Information Systems and the revolution in cartography: the nature of the role played by a commercial organization. *The American Cartographer* 15:3; pp. 301-310.
- Dent, B. (1990) *Cartography and thematic map design*. Second edition. Dubuque, IA: Wm. C. Brown.
- Dutton, G., editor (1978) *Harvard Papers on Geographic Information Systems: First International Advanced Study Symposium on Topological Data Structures for Geographic Information Systems* Volume 1. Cambridge, MA: Harvard University.
- McLauchlan, W. P. *American Legal Processes*. New York: John Wiley and Sons, Inc.
- Robinson, A., R. Sale, J. Morrison, and P. Muehrcke (1984) *Elements of Cartography*. Fifth edition. New York: Wiley and Sons.
- Visvalingam, M. (1989) Cartography, GIS, and maps in perspective. *The Cartographic Journal* 26; pp. 26-32.

El problema de determinar y formular una medida de conducto ético causa dificultad en muchas profesiones, incluyendo la profesión cartográfica. Para procurar y formalizar un discurso ético en la profesión cartográfica, los redactores de *Cartographic Perspectives* invitaron a cinco contribuidores a que examinaran sus percepciones de los problemas éticos en esta doctrina. Los contribuidores fueron seleccionados de los tres mayores sectores de la empresa cartográfica: organizaciones cartográficas comerciantes, agencias cartográficas del gobierno nacional, y universidades con departamentos de geografía que ofrecen cursos de cartografía. Los contribuidores indetificaron la vigilancia que ellos y sus instituciones siguieron en asegurar la calidad del producto cartográfico, el plagio cartográfico a través de la violación de la propiedad de una obra cartográfica, y el conflicto de intereses como temas éticos importantes.

El comentario concluye por cuestionar la inclinación y validez de la pretensión cartográfica a la exactitud, y afirma que los éticos cartográficos no pueden estar desconectados del significado exacto de nuestra sociedad que comisiona la producción de la información cartográfica.

## Los Problema Éticos en la Cartografía

### Comentario

Extracto

*Translation by Juan José Valdés  
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