

THE PUBLIC TRUST OF SURVEYS & MAPS

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The history of surveying and mapping can be traced back to the earliest written documents of civilization. Men and animals are territorial – animals mark their territory with their scent; while men use more permanent indicators, such as physical monuments, and have recorded dimensional details for millennia. Territorial creatures defend their territory – it's part of the definition of the word. It is that base instinct that profoundly affects the members of our profession in countries outside of today's open societies.

Topographic maps and the geodetic control used for large-scale mapping of large areas have long been considered of enormous military value. An old saying is that the army that has "the map" and is able to deny "the map" to its opponent is the army with the advantage. This tenet, although still practiced by some governments, is obsolete. The foundation of that philosophy of secrecy is rooted in the history of the last couple of hundred years. Napoleon Bonaparte used topographic maps to conquer a large area of Europe, and he mapped a portion of Upper Egypt and the Palestine. For a few years afterwards, the French kept those maps unpublished to maintain secrecy. The various topographic mapping projects (for more than a century) of the Austro-Hungarian Empire were considered military secrets, and some of the series were maintained only as manuscripts and foils.

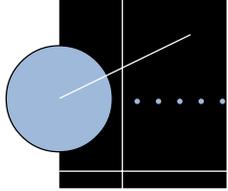
Printing large numbers of copies for use by their own troops was considered too dangerous a security risk!

The Survey of India has operated for most of its history as a military intelligence operation. In the early years, agents were dressed in disguises at times in order to garner approximate locations of villages and towns, information on local roads and topography, etc. The need for secrecy at the time was quite real, because the British were trying to wrest political control from the many local maharajas. That basic fabric of military secrecy still pervades the Survey of India to this day. The Director is a flag-rank officer in the Army. Recurring border skirmishes over contested territories add to the military's perceived need for secrecy in India. The availability of surveying and mapping data is quite problematic nowadays for peaceful use by Indian citizens. There's a simple rule: "you may not have the data."

I have written about the coordinate systems of countries in Latin America. Readers will recall that I commonly discuss "*La Ley*" (The Law), which refers to the legislated national monopoly of geodetic surveys and mapping services held by military forces throughout most of Latin America. The development of this trend can be traced to the European kingdoms and the division of power within those governments. The Europeans initiated their surveying and mapping activities for either cadastral (tax) purposes, or for military operations as part of the national defense. Generally, the topography was of more interest to the soldier than to the tax collector, and exquisite detail of planimetric features was of more interest to the tax collector than to the soldier. Such was (and is) the division of labor and types of maps compiled.

Therefore, the topographic map was considered (in the 19th century) to be the exclusive venue of the military in Europe. That philosophy was embraced by the many nations of Latin America around the turn of the century, and during the 20th century the militaries of many nations in the Western Hemisphere even took an extra step. Much of Latin America has a very well developed upper class and a large population of subsistence farmers and laborers. The majority of the population is unable to afford an income tax, much less own land in order to pay taxes on real property. The requirement for a military exists in most of Latin America (except Costa Rica), and the upper class resists efforts to submit to taxation on personal income. The solution is "*La Ley*," which provides that no entity in the country may fly aerial photography, compile maps, perform geodetic surveys, etc., except the military. By charging rather hefty prices for its mapping services, the military is able to help finance itself. This social phenomenon is gradually beginning to change because local civilian professionals are knocking on the Army's door for grants of exceptions to "*La Ley*" for certain government-sponsored projects. Far more pervasive change is the re-ordering of basic society where land titlization projects are taking hold, often financed by foreign aid groups from North America, Europe, and the Orient. Tolerated by national governments, these civilian mapping agencies are surveying the land with photogrammetric methods (some of it aerotriangulation of my design and specifications), with GPS equipment, and coordinating the effort with state-of-the-art GIS technology. The "Army" is begin-

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ning to lose its foothold in these societies, and peasants are now getting deeds to the land they have tilled for generations. With color of title, farmers can obtain loans for implements, seed, and the occasional luxury to enhance their quality of life.

The use of espionage for obtaining technical data for strategic and tactical military advantage has been practiced extensively during the first half of the 20th century. The "Planhefts" of Nazi Germany were compiled and published for the use of the topographic engineer to utilize existing native maps alongside German data. The enormity of the successful collection process was not fully realized until the end of the war and documents were captured comprising the *Planheft* collections. These data were valuable because geodetic control was performed in the classical manner with theodolite and chain (invar tape). Classical triangulation was difficult, expensive, slow, and scarce. By obtaining the observation data of the chains of triangles, one could compute extensions of one's own country geodetic control into a neighbor's territory. When we have access to the geodetic data, we can relate our topographic maps to their topographic maps and thereby control our artillery fire into their soon-to-be-lost lands. Such was the state of the world until the 1950s.

Then, Sputnik happened. From that initial beep-beep-beep, space geodesy was born and the need for national survey and mapping secrecy disappeared. We now have **commercial** imaging satellites; the resolution is at near optical limits; and, there are no borders that can keep the eyes away. The Global Positioning System is truly global; instruments that fit into a shirt pocket have absolute positioning accuracy far better than a 1950s geodesist with a T-4 astronomical theodolite

and radio time receiver. The survey-grade instruments can deliver post-processed accuracies within the width of a pocket coin. There is no rational reason for further secrecy of survey and mapping data.

What irrational reasons exist for such secrets? "Well, we've always done it that way." "We have continuing problems with our border and that country over there." Guess what? They already have sufficient photo data and positioning information that was purchased on the open international market. "All of our maps are classified secret and national laws forbid releasing the data to our citizens." Guess what? Your retiring military has already sold hundreds of complete sets of topographic maps to foreign map sellers on the black market. Your secrets are not secret. The retirees took care of their own pension funds.

The United States of America has always had an open society. That openness recently cost us thousands of lives in a few minutes, but our society is not going to change. The openness of survey and mapping data is what drives development and improvements. The basic fabric of a topographic mapping system for a nation is its geodetic control. Note where the U.S. National Geodetic Survey is located; within the Department of Commerce. Commercial development, buildings, construction, exploration, mining, financing, etc., all are dependant on the free and open exchange of survey and mapping data. The United States is going to continue to be an open society, and the free geo-data is the grease in the axle for the wheels of progress.

The maintenance of closed societies only restricts the citizens of that society; in this day and age there is no security from such a philosophy. It should be readily apparent that this monthly column regularly publishes extremely ob-

scure (and oftentimes secret) data of coordinate systems of countries all over the world. Everybody else in the world can get the data for any place in the world at market prices. Why deny national data to your own citizens? Local nationals have been sitting in prison in their countries for having possessed the same coordinate system details, datum transformations, etc. that have been openly published in *PE&RS*. Presumably, these souls have since been released by embarrassed prosecutors and courts.

The offered solution to this social paradox is change from within. The United States and most developed countries offer the example of openness. Open does not have to mean "no charge." Fair market price is a just means to recoup expenses, but citizens have the right to the survey and mapping data of their own nations. Once the exclusive domain of the military, commercial imaging and positioning is out of the bag – security is obsolete for GIS data. The public trust in national governments no longer justifies the denial of geospatial data to the citizenry. Laws and policies must change in the face of reality.

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Have you
moved?
Is your
membership
current?

Please update your
membership record on the
ASPRS website at
www.asprs.org