The PORTOLAN

Issue 95 Spring 2016 JOURNAL OF THE WASHINGTON MAP SOCIETY

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Lost and found

Hendrick Doncker II's *Nieuw Groot Zeekaart Boek.* Amsterdam. 1714

by Jason Hubbard and Frederik Muller

(Detail of Frontispiece), Hendrick Doncker II *Nieuw Groot Zeekaart Boek*. Amsterdam. 1714.

In This Issue

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The Washington Map Society

The Portolan (ISSN 1096-1925) is published three times per year by the Washington Map Society. Annual subscription rates: US: $45 (1st yr student rate $25); Canada $50; All other countries: $65; Single Copy to U.S: $16.00; Canada $18; Other countries: $23. All payments are to be made in U.S. currency. Internet Address: *http://www.WashMapSociety.org*

Address all editorial correspondence to the Editor. Viewpoints of the authors do not necessarily reflect those of the Society.

Inside

FROM THE EDITOR

Three months remain in the current program season, with several activities yet to enjoy. See WMS MEETINGS on page 3.

Map discoveries could be the sub-title of this Spring issue: Donckers maps in the Netherlands and the possible first state of the 1770 John Henry map of Virginia at the Biblioteca Nacional de España in Madrid. Those plus an examination of the use of maps in legal proceedings and yet more important maps from the Albert Small Collection.

WMS founding member John Wolter and "Ottoman Tom" Goodrich are remembered for their many cartographic accomplishments. There are six books reviewed, taking readers from Mercator to the American Revolution to Malta to Britain to very new mapping concepts.

The summer months will mean a pause of most map-focused meetings, but many exhibits remain open—from Colonial Williamsburg to Washington and places worldwide—see the several pages with just a few meetings noted, but ALWAYS consult *www.docktor.com* for the FULL list of meetings and exhibitions worldwide. There is likely a map exhibit somewhere near where you live or on your travel route.

Tom

The Use of Maps in Legal Proceedings

By J.C. McElveen

INTRODUCTION

Maps may be used in a very wide variety of ways in all sorts of legal proceedings. They may be used as direct evidence, such as a survey of a piece of property in a land dispute, or they may be used as demonstrative exhibits, which may assist the finder of fact in a case to understand some aspect of that case. Although maps are used most frequently in civil cases—cases which seek money damages or an injunction, an adjudication of rights or an entitlement—maps may also be used in criminal matters, either as direct evidence (such as a case alleging the defendant stole certain maps), or as demonstrative evidence (such as a case in which the route of an alleged carjacker is shown to a jury.) This article will discuss examples of the use of maps in each of these contexts.

Preliminarily, a word should be said about the availability of maps from legal proceedings. Even though there are probably thousands, if not hundreds of thousands, of cases that have used maps in some way, they are not easy to come by. There are a lot of reasons for that. First, the vast bulk of cases—up to 95%—are settled, rather than going to trial or hearing. Once a case is settled, the files go into storage, or are destroyed. Second, many, many legal proceedings are administrative (e.g., workers' compensation cases; mediations; arbitrations), and those records are almost impossible to access, unless you were involved in the case. Third, of those cases that are tried in court, most do not get appealed, and the only record that exists is in the file room or basement of the courthouse, or in off-site storage. When cases are appealed, the part of the case involving the map may not be the subject of the appeal, and no map is transmitted to the appellate court. The vast bulk of appellate decisions, even when a map has some relevancy to the appeal, do not print the map as a part of the decision. That problem has become more acute in recent years, because almost no court prints maps in the electronic version of the opinions. However, since maps are a part of so many cases, a number of examples have made it past all these hurdles, and will be discussed below.

THE EVIDENTIARY VALUE OF MAPS

Since maps may often have great evidentiary value, it is necessary to make sure certain prerequisites are met, before they come into evidence. The first of these inquiries is "is it relevant?" In other words, would the fact finder (a judge, a jury, a hearing officer, an arbitrator) find it useful to refer to the map? For example, in an automobile accident case, a map of an intersection may be absolutely accurate, but the collision may not have taken place in that intersection. So, it isn't relevant.

Once it has been determined that it is relevant, the next inquiry is "is it accurate?" Questions subsumed within that inquiry include "who did it?; was it done by a person who was familiar with the scene?; for what purpose was it done?; is it to scale? (government maps often get a pass on such inquiries); are there other indicia of reliability about it?"

PROPERTY DISPUTE CASES

Although there is no way to prove it beyond any dispute, it is likely that the largest number of cases involving the use of maps are property disputes. Property disputes are many and varied. They include boundary disputes, zoning disputes, easements, rights of way, suits to quiet title (to determine who owns a piece of property), sale contracts, mineral rights and eminent domain, among others.

One of the great treasures of the Geography and Map Division of the Library of Congress is possibly the earliest known map used in litigation. The map is about 30 by 33 inches; it is made of fig bark; it contains several images; and it contains writing both in Spanish, and in the language of the Aztec—Nahuatl.[2] The writing contains various assertions, by the witnesses identified in the writing, about land ownership issues (**Figure 1**). This map is apparently some sort of exhibit in a lawsuit, in which the Aztec leaders of Texcoco, near Mexico City, are claiming the Spanish wrongfully took some land, as a forfeiture, after they executed an Aztec leader, Don Carlos Chichimecatecotl, for worshipping idols and for immorality, by having multiple wives.[3]

One part of the "exhibit" shows a palace of some sort, and the property surrounding it (**Figure 2**). The Spanish gloss basically says the palace did not belong to Don Carlos in perpetuity, he just had a life estate in it. After his death, though, it reverted to the ruling line of Texcoco.[4] The Nahuatl gloss is a lengthy story about how Don

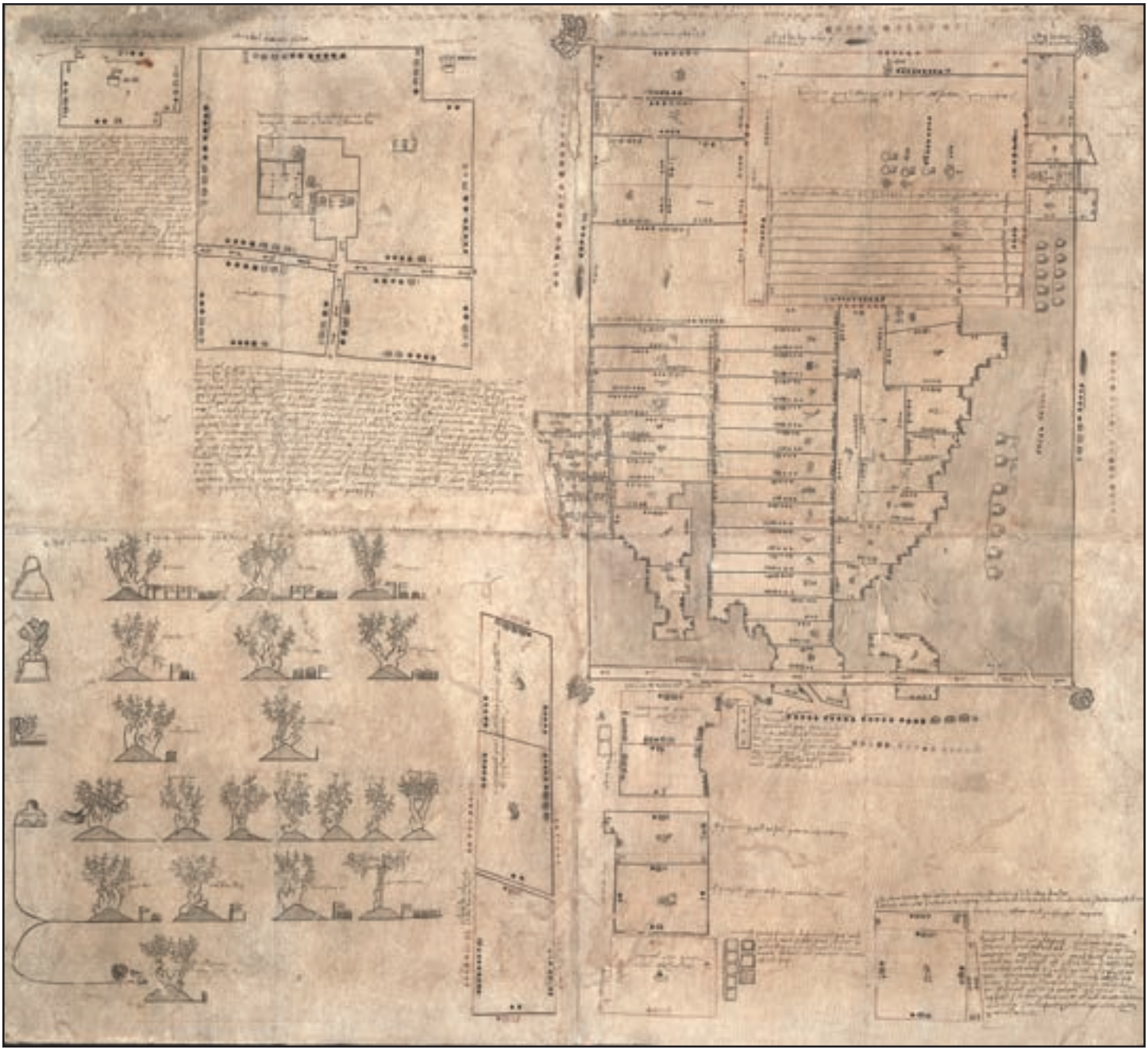

Figure 1. Litigation map of Oztoticpac, an estate in Texcoco, ca. 1540. Call Number G4414.T54:209 1540.09. *www.loc.gov/item/88690436*. Courtesy Library of Congress, Geography and Map Division.

Carlos got the life estate. The goal here was to convince the court that the property should not be forfeit to the Spanish, since it didn't belong to Don Carlos's estate after his death.

A second area of the "exhibit" shows a number of properties, organized in almost the same way as a modern property subdivision plat (**Figure 3**). The Spanish and Nahuatl glosses to this section of the map list which of the properties belonged to Don Carlos and which did not.[5] (Presumably the Spanish had declared the entire subdivision forfeit.)

A third area of the "exhibit" consists of drawings of fruit trees—labeled apple, pear, peach, quince and pomegranate **(Figure 4)** Here, the testimony of the witness is that he and Don Carlos went into business together, to graft European fruit tree branches onto Aztec root stock. A part of the pictograph attempts to show joint ownership, by showing two hands holding the same tree (**Figure 5**), and the claim is that, since Don Carlos is dead, the witness should be the owner of the trees, rather than the Spanish.[6] Obviously, this part of the case could as easily have been a modern dispute between two wine-grape growers, over a deal to graft old-world vines onto new world root stock.

The problem of losing all or part of your property to the government is one that is as real today as it was in 1540. Thousands of cases over the centuries have involved some aspect of that problem. In the United States, of course, the 5th Amendment to the U. S. Constitution provides that "private property" shall not "be taken for public use, without just compensation."[7] A good recent example is the case of McCann Holdings v. United States.[8] There, a Sarasota, Florida landowner sought compensation for the government's establishment of an easement, over a portion of its 306 acre vacant and undeveloped property, for a recreational trail, pursuant to the Rails to Trails Act.[9] That statute allows for the conversion of old railroad rights of way to recreational trails. The easement in this case was 50 feet across, and about a mile long, on the western edge of the Plaintiff's property. The area of the property at issue was 6.4 acres. The court awarded over three million dollars as "just compensation." The map attached to the decision by the court is an example of the adage that "a picture is worth a thousand words". The map showed that the property in question was prime subdivision land, nestled between two very large subdivisions, in Sarasota.

Although fights with federal, state and local governments over property are common, by far the most common land disputes are between private parties. A good example of such a dispute is the case of Dykes v. Arnold.[10] In that case, various plaintiffs and a defendant owned several adjacent lots in a rural area of Lincoln County, Oregon. They disputed the location of one of the property boundary lines, and, thus, the ownership of a strip of property. From a procedural point of view, the plaintiffs brought an ejectment action (seeking to "eject" the defendant from the disputed strip of land), and the defendant filed a counterclaim, seeking to "quiet title" in his favor (that is, have the court declare that he was the rightful owner of the strip of land.)[11]

Though this case was decided in 2006, the actions which began the dispute first occurred in 1867, because the dispute involved a piece of property that had originally belonged to the federal government, and had passed into private ownership as a land grant, or "patent", issued by the federal government's General Land Office. Before the government would convey the land to private ownership, it had to be surveyed, by a federal government surveyor, and the plat of the survey, and the surveyor's notes had to be filed with, and approved by, the federal government.[12] That was done in 1867.

By way of background, the court described, in some detail, the process by which the government went about surveying much of the land north of the Ohio River and west of the Mississippi, (about 1.5 billion acres) dividing it into grids of increasingly smaller squares. The court described the "rectangular survey system," which divided the land into concentric squares. These squares began with an initial reference line, called a meridian. Within the meridians would be north-south "township" lines, intersected by east-west "range" lines, The intersections of those lines formed squares six miles on a side, called "townships", and each township was divided into 36 one-mile squares, of 640 acres, called "sections" [13] (**Figure 6**). Surveying was usually done using compass bearings and chains. Each chain was 66 feet in length, and 80 chains, laid end to end, marked off a mile. Down to the level of the section, the surveying was done by surveyors employed by, or under contract to, the federal government. In addition to surveying the sections, the federal surveyors physically marked, or "monumented" the corners of each section, and also set markers at each of the "quarter corners" of each section: that is:, the four points halfway between each of the corners of each section.[14] This system also contemplated the further subdivision of sections, into "quarters" of 160 acres each; into "half-quarters", of 80 acres; and

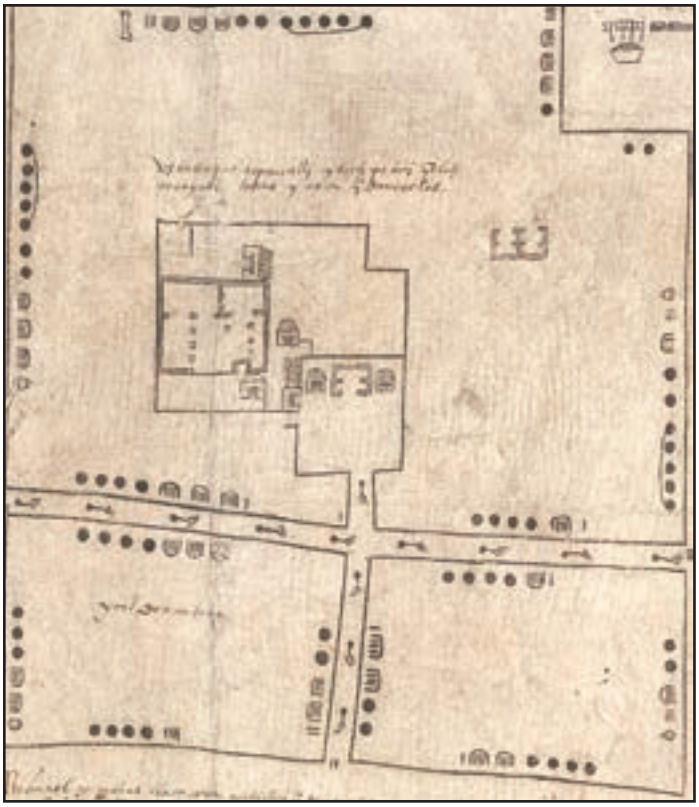

Figure 2. (Detail) House and surrounding property. Litigation map of Oztoticpac.

Figure 3. (Detail) Organization of properties. Litigation map of Oztoticpac.

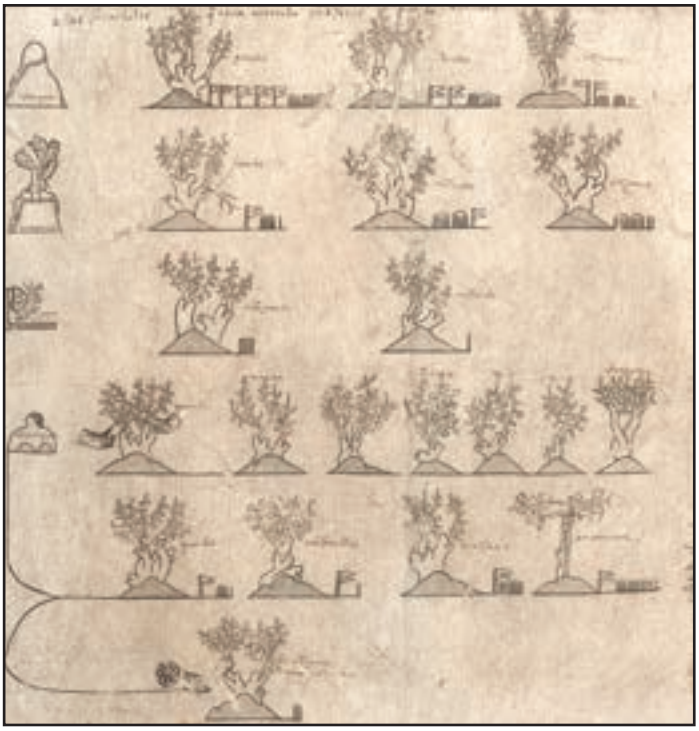

Figure 4. (Detail) Drawings of fruit trees. Litigation map of Oztoticpac.

Figure 5. (Detail) Representation of joint ownership. Litigation map of Oztoticpac.

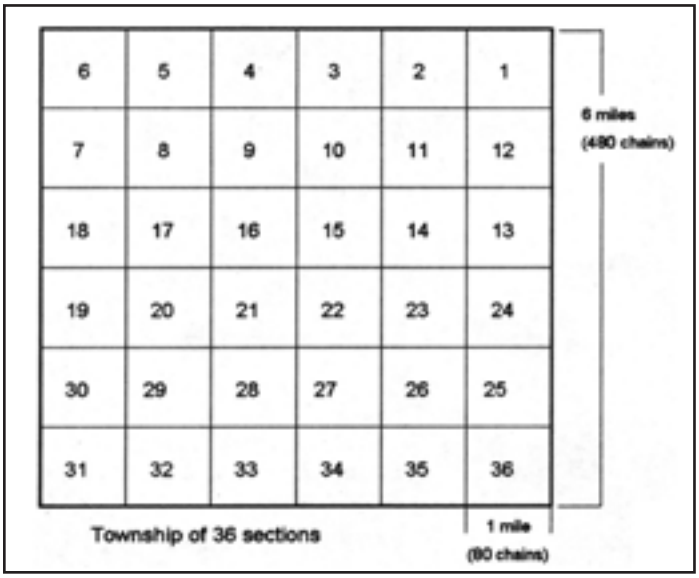

Figure 6. Township Sections.

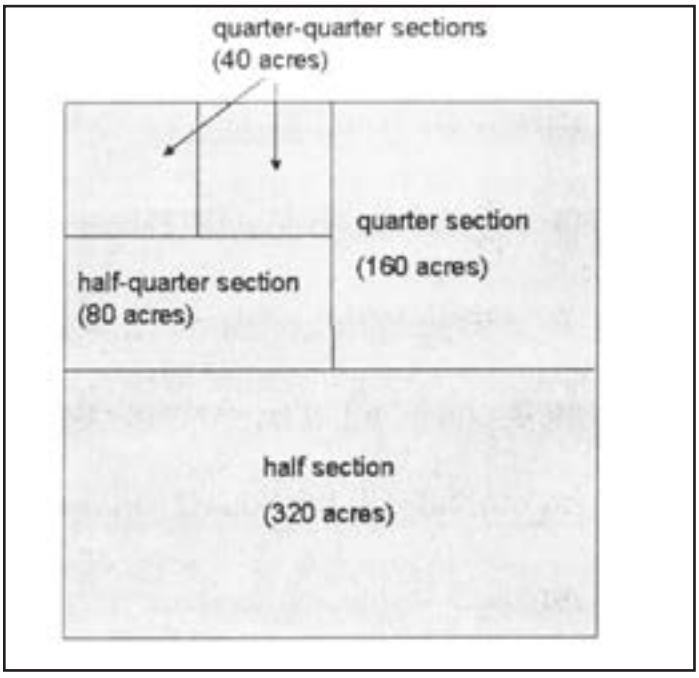

Figure 7. Half- and quarter- sections.

into "quarter-quarters", of 40 acres[15] (**Figure 7**), but these smaller sub-sections were surveyed by local surveyors.

As the court in the Dykes case pointed out, in a classic piece of understatement, "those surveys of the 1800s were not models of precision." The court noted that, among other things, "the surveying equipment and chains were heavy and, by some standards, 'inferior'; the chains could become worn and less exact; the terrain was often rough, steep and densely forested…; [and] frequently, the crews took shortcuts of various kinds, rather than follow to the letter the technical instructions prescribed by the federal government."[16] So, thousands of land disputes ended up in court over the years, based solely on allegedly faulty land surveying.

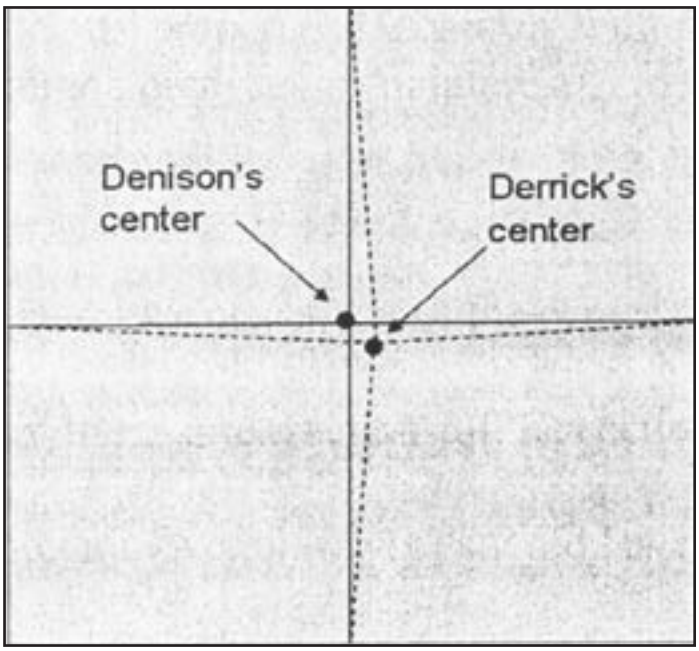

Figure 8. Dueling Center Lines.

The dispute in the Dykes case occurred because the county surveyor, when he first surveyed the interior of the Section in question, in 1899, took a shortcut in determining what the center point of the section should be.[17] An appropriate survey would have located the center point by finding the point of intersection between all four of the opposing quarter corners. However, this county surveyor took a shortcut, called "stubbing in". He marked the center as the midpoint of only two of the quarter corners.[18] Though you wouldn't think that approach would make any real difference, the true center point was, in fact, off by a good many feet (**Figure 8**) However, the property belonged to the same family for many years thereafter, thus it made no difference. During

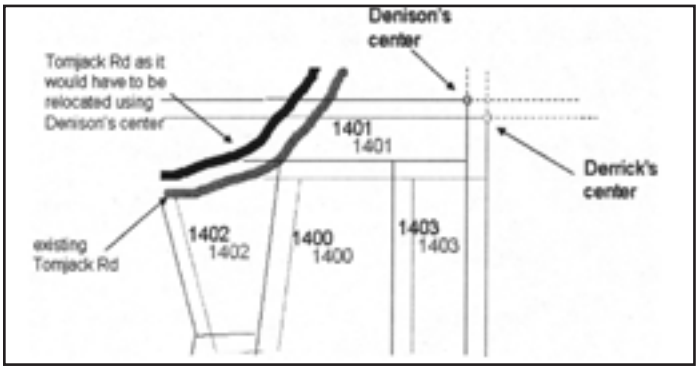

Figure 9. Tomjack Road.

the next century, a number of improvements, including a road, were placed on the property, assuming the property lines were appropriately drawn. By the time owners outside the family took title to some lots, in the 1990s, and sought to correct the error, by means of a lawsuit, the court held that too much time had passed, and too many changes had been made, assuming the originally surveyed lines (**Figure 9**). Therefore, the lines would stay where they were, incorrect or not.[19]

One other type of property dispute should be mentioned, and that is the dispute between states or a state and the United States, over which entity "owns" certain property. The United States Supreme Court has original jurisdiction to hear disputes between states, or between a state and the United States,[20] so these cases begin, and end, at the Supreme Court. Since the Supreme Court does not usually hear evidence and make findings of fact, as trial courts do, these cases are now referred, by the Court, to Special Masters, who summarize the evidence and submit a report to the Court. The parties then argue before the Court. A couple of cases will illustrate this type of litigation.

In the case of United States v. Texas,[21] decided in 1896, the issue was whether Greer County, a county claimed by Texas, truly belonged to Texas, or was a part of the newly formed Oklahoma Territory. The crux of the matter was how a particular provision of the 1819 Treaty between the United States and Spain was to be interpreted. The Treaty, which was ratified by Congress in 1821, provided that:

> "The boundary line between the two countries, west of the Mississippi, shall begin on the Gulf of Mexico, at the mouth of the river Sabine, in the sea, continuing north, along the western bank of the river to the 32d degree of latitude; thence, by a line due north, to the degree of latitude where it strikes the Rio Roxo of Natchitoches, or Red River; then following the course of the Rio Roxo, westward, to the degree of longitude 100 west from London and 23 from Washington…The whole being as laid down in Melish's map of the United States, published in Philadelphia, improved to the first of January, 1818."[22]

Though Texas subsequently became part of Mexico, then a Republic, then a state, the quoted portion of the boundary had (and has) remained Texas's eastern and northeastern boundary. There were two basic problems with that treaty language, however: first, the 100th meridian of west longitude, as located on the 1818 Melish map was about 100 miles east of the true 100th meridian of west longitude, and second, there is a fork in the Red River, and there was no indication in the treaty as to whether the treaty line was to run up the North Fork of the Red River, or the Prairie Dog Town Fork of the Red.[23] Texas claimed that the boundary line ran up the North Fork of the Red, and that Melish's location of 100 degrees West longitude should be accepted (The Supreme Court noted that such resolution would result in Texas possessing a large part of Indian Territory, as well as a portion of the present states of Kansas and Colorado, and a part of the Territory of New Mexico.)[24] (**Figures 10a** and **10b**).

After reviewing the evidence surrounding the treaty negotiations leading to the treaty between the U. S. and Spain in 1819; the subsequent agreement with Mexico, when it broke off from Spain; the negotiations surrounding the establishment of the Republic of Texas; the negotiations surrounding the admission of Texas as a state, in 1845; and the Compromise of 1850, as it impacted Texas; and referring to 18 maps of the area, from 1819 to 1851,[25] the Court sided with the United States, (holding, among other things, that when the United States and Spain said the 100th meridian of west longitude, in 1819. they meant the true 100th meridian). The Court also held that the original 1819 treaty line went along the Prairie Dog Town Fork of the Red River, not the North Fork.[26] Therefore, the land which was Greer County became a part of the Oklahoma Territory, and, subsequently, Oklahoma.

In another case, *United States v. California*,[27] decided in 1965, the Supreme Court was asked to decide the meaning of certain language in the Submerged Lands Act,[28] as that language pertained to California. The Submerged Lands Act grants to the states "title to and ownership of the lands beneath navigable waters within the boundaries of the respective states."[29] "Boundaries" include the

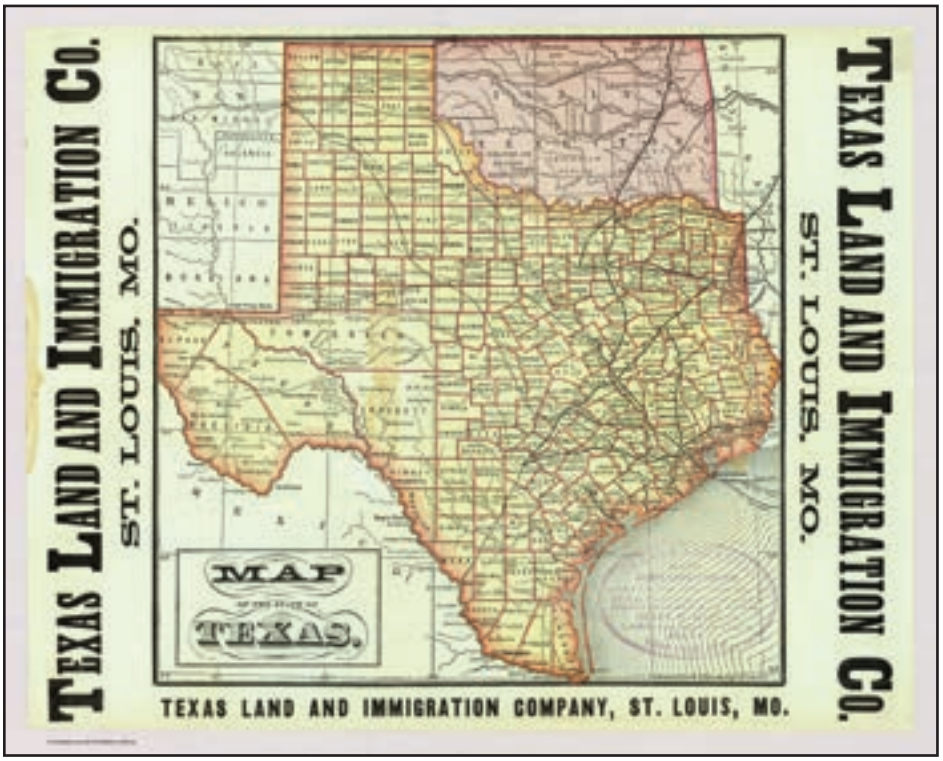

Figure 10a. Map of the state of Texas. Woodward, Tiernan & Hale, Map Engr's St. Louis. Texas Land and Immigration Co. St. Louis, Mo. (1876). Courtesy David Rumsey Map Collection. *www.davidrumsey.com/maps770061-22080.html*.

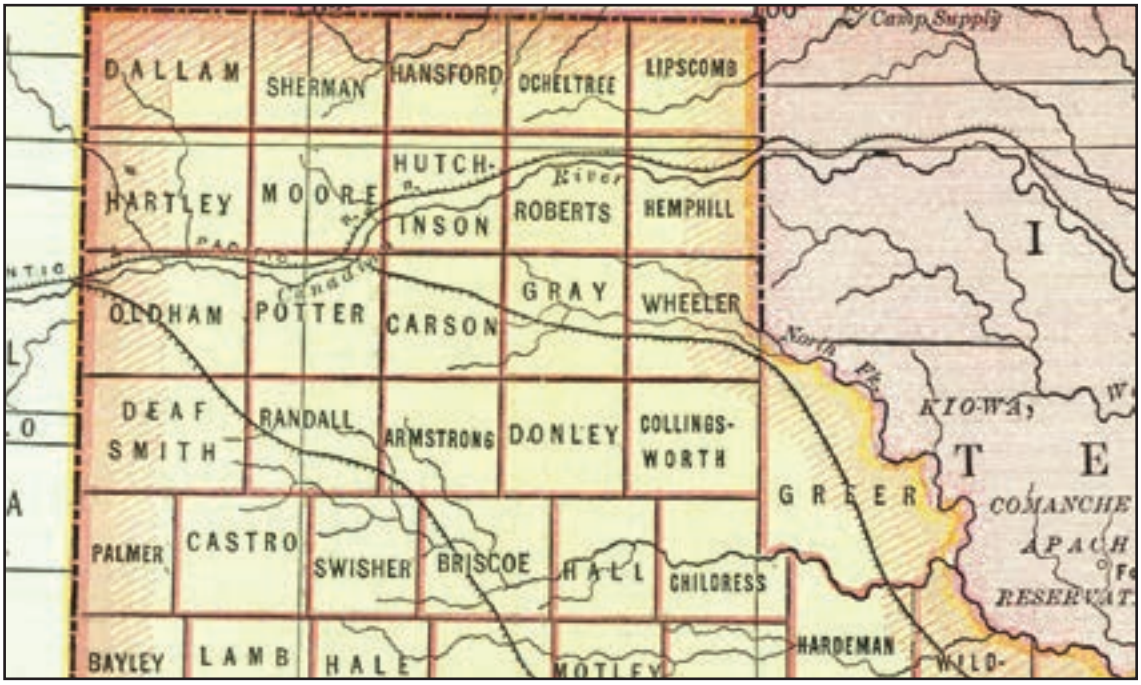

Figure 10b. (Detail of area around Greer County). Map of the state of Texas. Woodward, Tiernan & Hale.

Figure 11. California's claim of inland waters.

seaward boundaries of a state "as they existed at the time such state became a member of the Union, or as heretofore approved by the Congress", but subject to the limitation that "in no event shall the term boundaries…be interpreted as extending from the coast line more than three geographical miles into the Atlantic Ocean or the Pacific Ocean, or more than three marine leagues into the Gulf of Mexico."[30] "Coast line" was then defined as the composite "line of ordinary low water along the portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters."[31] "Inland waters" was not defined in the Act.[32]

Among other things, California claimed that all the submerged land three miles to seaward of a line that connected all of California's offshore islands were the "inland waters" of California. This line was, in some spots, up to 50 miles off the mainland and contained the Santa Barbara channel, the San Pedro Channel and the Gulf of Santa Catalina[33] (**Figure 11**). The United States claimed that California was entitled only to a belt of submerged land within three miles of the mainland, and within three miles of each of the offshore islands.[34] The Supreme Court held that the United States position was the correct one.[35]

However, there was a dissent. The dissenting Justices stated that they would at least give California the opportunity to prove that its boundaries, when it came into the Union, included the channel between its offshore islands and the mainland.[36] In support of allowing that argument to be made, the Justices said that "a statement in the original California Constitution, several official maps, including the one used at the California constitutional convention in 1849 and other evidence tend to support California's contention that it historically owned…the channel between the islands and the mainland."[37] Indeed, the map used at the 1849 California constitutional convention is the "Map of Oregon and Upper California, from the Surveys of John Charles Fremont."[38]

REDISTRICTING CASES

Maps are very commonly used in cases involving the redrawing of legislative districts by state legislatures. Perhaps the most famous re-drawing of a district occurred in 1812, and involved Elbridge Gerry. That state legislative district, which ended up looking like a salamander, gave rise to the use of the term "Gerrymander," to describe the creation of legislative districts for purely partisan purposes.[39] Many other odd-looking districts, state and federal, have been created over the years. In 1993, in the case of Shaw v. Reno,[40] the U. S. Supreme Court ruled on what is perhaps the most famous of the modern gerrymandered districts—the 12th Congressional District of North Carolina.

North Carolina's 12th District, as drawn by the North Carolina legislature, contained a majority of black voters. Although such a district is not per se illegal, it is a violation of the Equal Protection clause of the 14th Amendment to the Constitution[41] for there to be a district drawn with the specific purpose of creating a district with a majority of one race, unless there is a "compelling government interest" for doing so.[42] Such an action is known as a "Racial Gerrymander."[43] The opponents of this district challenged it on the basis that the only purpose of drawing it this way was to assure the election of a black representative from that Congressional District.[44]

Indeed, the district did look a little unusual. The district was 160 miles long, and it ran from Durham, N. C., through Greensboro, High Point and Winston-Salem, and into Charlotte. It ran along Interstate 85, and, in some locations, it was no wider than the Interstate right-of-way (**Figure 12**). Justice Sandra Day O'Connor, who wrote the Supreme Court's majority opinion, said that "northbound and southbound drivers on I-85 sometimes find themselves in separate districts in one county, only to 'trade' districts when they enter the next county."[45] Justice O'Connor also quoted a North Carolina legislator who said "if you drove down the Interstate with both car doors open, you'd kill most of the people in the district."[46]

At the end of the day, the Court, in a 5–4 decision, sent the case back to the U. S. District Court, to determine if the district had been drawn on the basis of race, and, if so, whether such a racial gerrymander was "narrowly tailored to further a compelling government interest."[47]

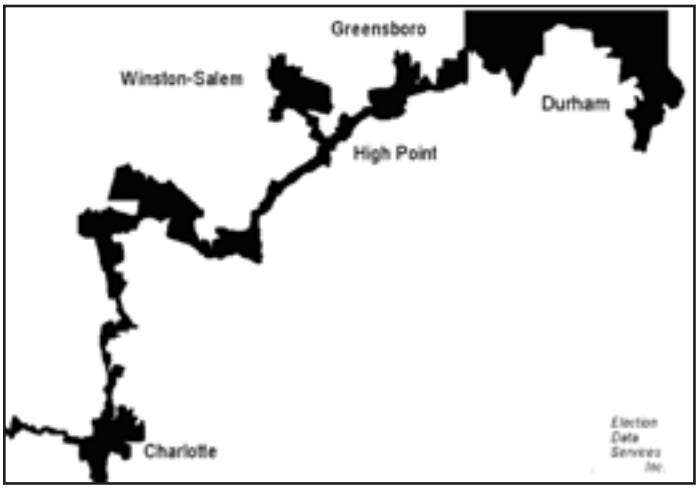

Figure 12. 12th Congressional District of North Carolina, 1992. *www.senate.leg.state.mn.us/departments/scr/redist/redsum/ncsum.htm*. Courtesy Election Data Services, Inc.

ENTITLEMENT CASES

An entitlement case is one in which a person seeks some form of compensation by virtue of that person satisfying a set of statutory prerequisites for that compensation. The classic entitlement program is Social Security. However, there are many others. State workers' compensation programs are entitlement programs, if certain injury, illness and disability requirements are satisfied. Certain federal programs, such as the Black Lung Act program (coal workers' pneumoconiosis);[48] the Jones Act (injuries to seamen);[49] and the Longshore and Harbor Workers' Compensation Act[50] are entitlement programs.

Some of these entitlement programs utilize maps, to help determine who is eligible for compensation. For example, from 1945 through 1962, the United States conducted a series of above-ground atomic weapons tests[51] in the Nevada desert. Some years following the end of testing, some unusual patterns of cancer began to appear in some people who lived downwind of these tests. Some of these people (and families of those who had died) filed suit against the United States, under the Federal Tort Claims Act,[52] alleging that the government had been negligent in the conduct of those tests, and that negligence had resulted in their injuries. Several courts found that the government had, in fact, been negligent, but they also found that the atomic testing was a discretionary act of the government.[53] The Federal Tort Claims Act provides that, if people are injured by a discretionary act of the government, the government is not liable.[54]

Therefore, Congress got into the picture and passed a specific statute, called the Radiation Exposure Compensation Act. [55] That Act provides that, if, in a lawsuit against the government, a person can prove that:

> During a given time period specified in the statute;
> He or she was on-site, or was in a specific downwind area;
> And he or she suffers or suffered from one of a listed group of cancers (essentially cancers associated with radiation exposure, such as leukemia, lymphomas, thyroid cancer and some others);
>
> He or she will be entitled to a certain amount of compensation.[56]

For purposes of determining entitlement, a map shows what downwind areas are included[57] (**Figure 13**).

Following the attacks on September 11, 2001, Congress passed a law allowing certain individuals who sustained injuries as a result of those attacks (or the family members of those who died as a result of those attacks) to receive certain monetary damages.[58] A Special Master was appointed, by the statute, to oversee the claims process.[59]

The initial step in the claim evaluation process was to determine whether a claimant was an "eligible individual." The statute defined that term to include individuals who were aboard the flights or were individuals "present at the World Trade Center, the Pentagon or the site of the aircraft crash at Shanksville, Pennsylvania, at the time, or in the immediate aftermath of"[60] the crashes. The second step was to determine that physical harm or death had occurred as a result of any of the crashes.

The term "present at the site" was not defined in the statute. However, due to the configurations of the Pentagon and Shanksville locations, it was fairly easy to establish what "at the site" meant. New York was a different story. Some people wanted "the site" to encompass all of Manhattan. Regulations promulgated pursuant to the statute defined the "site" to include "the buildings or portions of buildings that were destroyed as a result of the airplane crashes" and "any area contiguous to the crash site that the Special Master determines was sufficiently close to the site that there was a demonstrable risk of physical harm resulting from the impact of the aircraft or any subsequent fire, explosions or building collapses…"[61] The Special Master and his attorneys examined aerial photographs and maps of the debris field for all debris larger than particulate matter. Ultimately, the "site" was defined as being within the boundaries of the New York Police Department Pedestrian No

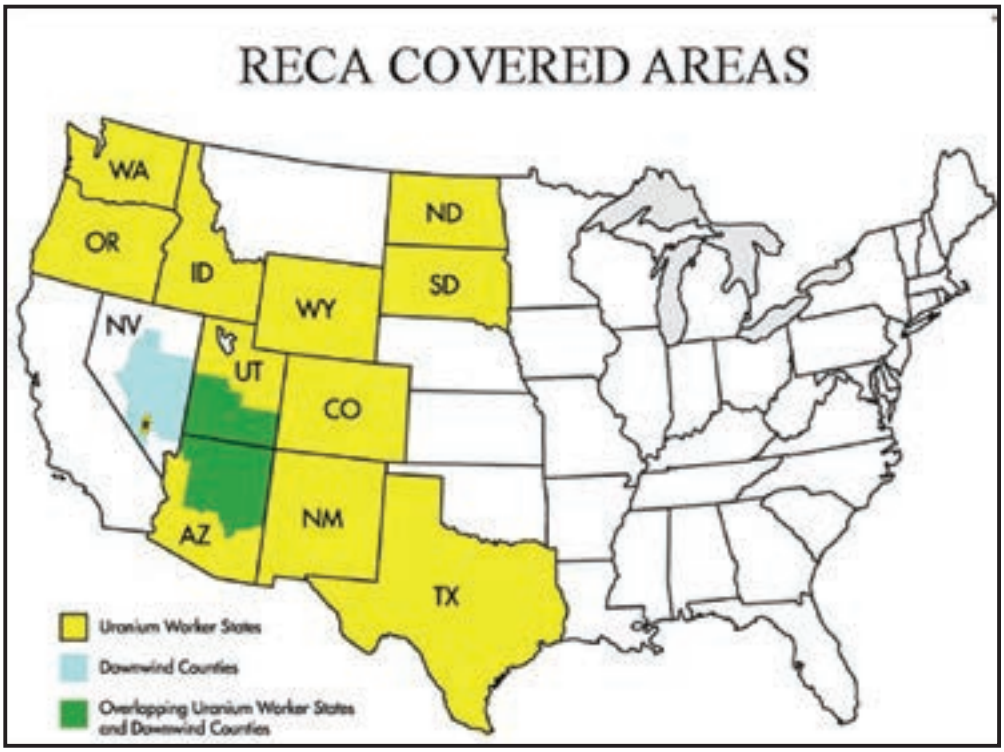

Figure 13. "RECA Covered Areas." United States Department of Justice. *www.justice.gov/civil/common/reca*.

Access Zone, plus one block in each direction.[62] Thus, the boundaries were set as follows: from the intersection of Reade and Center Streets; west along Reade Street to the Hudson River; south along the Hudson River to West Thames Street; east along West Thames Street, Edgar Street and Exchange Place, to Nassau Street; north from the intersection of Exchange Place and Nassau Street, along Nassau Street, to the intersection of Center and Reade Streets[63] (**Figure 14**).

In 2009, the statute was amended by the "James Zadroga 9/11 Health and Compensation Act of 2009.[64] That statute expanded the covered area to anything south of Houston Street and to any block in Brooklyn within 1.5 miles of the World Trade Center site, expanded the class of individuals who could file claims and expanded the types of conditions that could be covered. (e.g., respiratory diseases.)

CRIMINAL CASES

Maps are often used in criminal cases, either as direct evidence, or as so-called "demonstrative exhibits", used to illustrate some aspect of the criminal behavior, but not used to try to prove any of the elements of the crime.[65] The best example of the first use of maps is in a prosecution for stealing maps. There, the maps are the evidence. Some, or all, of them would be identified and authenticated by the victim of the theft, and a value would be placed on them. Other witnesses might be called, to place the maps in the defendant's possession.[66] Examples of maps as demonstrative exhibits might include a map of the neighborhood of a bank robbery;[67] or of a burglarized house and the surrounding area;[68] or of the route an alleged kidnapper took, with the victim, even if the map were not drawn to scale.[69]

One interesting use of a map was in the case of Gary Dean Harger v. State of Oklahoma,[70] In that case, Mr. Harger was a suspect in the strangulation death of his ex-wife. While he was being questioned, in the presence of his lawyer, and after he had been advised of his Miranda rights, he was asked if he would divulge the location of his ex-wife's body, so she could receive "a decent burial." He said her body was "in the Waukomis area." He was asked if he could be more specific. He then drew a map, showing where the body had been placed.

Before the defendant's lawyer gave the map to the sheriff, he asked: "you won't use this against him, will you?" The sheriff replied: "I'll give it back to him." In fact, the map was returned to the defendant's lawyer, but the information on it was used to retrieve the ex-wife's body. On

Figure 14. NYC Map of Exposure Zone. September 11th Victims Compensation Fund. US Department of Justice. *www.vcf.gov/nycExposureMap.html*.

the basis of that (and other) evidence, the defendant was convicted of murder. He appealed, arguing that his statement and the map he drew were "statements" coerced by a promise that they would not be used against him at trial. The appellate court held that there was no coercion, and it let the conviction stand.[71]

NEGLIGENCE CASES

Negligence is "the failure to exercise the standard of care that a reasonably prudent person would have exercised in a similar situation."[72] These cases are between private parties (or sometimes between private parties and governmental entities), and they allege that someone (the defendant) owed a duty of reasonable care (behavior) to someone else (the plaintiff); that the duty was breached by the defendant; and that property damages or personal injury resulted.[73] One of the very common types of negligence cases in which maps are utilized are automobile accident cases. In almost all accidents that are investigated by the police, a map of the site of the collision is generated[74] (**Figure 15**). (In fact, many police report forms have pre-printed drawings of various types of intersections.) However, many other types of negligence cases, such as airplane crashes, fires, explosions, toxic releases from chemical plants or storage sites, and even surfing accidents on a Hawaii beach[75] (**Figure 16**), have their share of maps.

CONCLUSION

The litigation of many, many disputes benefits from the use of maps that illustrate an issue in the case. The cases discussed in this article represent just a few of the types of matters in which maps are used in legal proceedings. As technology becomes more sophisticated and less expensive, future cases may present to the jury the movement of vehicles of various sorts and even people, based on GPS tracking from cell phones or other tracking devices. Extremely sophisticated simulations of the movement of the release of toxic vapors, the flow of errant groundwater, the origin and spread of a fire, the breach of a levee during a hurricane, or any of almost limitless other situations, may also become common.

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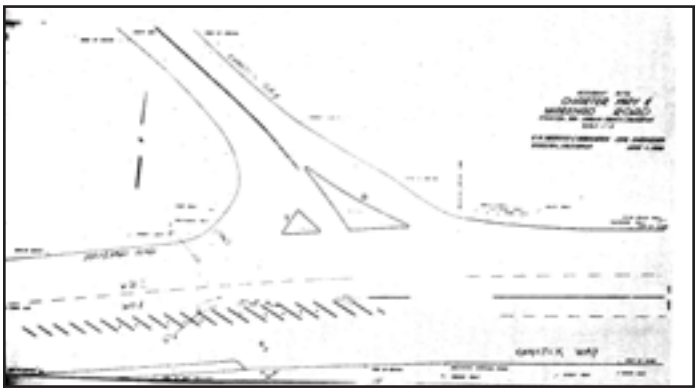

Figure 15. Intersection.

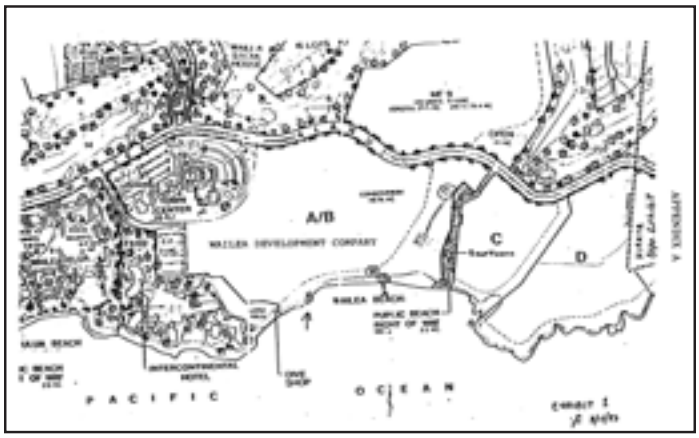

Figure 16. Wailea Beach, Hawaii.

ENDNOTES

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33 85 S. Ct. at 1422–1423.
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35 85 S. Ct. at 1419–1420.
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