THE UPDATED CLASSIC GUIDE TO LAND BOUNDARY LAW AND EVIDENCE DISCOVERY

The revised Seventh Edition of *Evidence and Procedures for Boundary Location* serves as the seminal guide to the principles and concepts of land boundary law and evidence for accurately determining boundaries. Written by a team of noted authorities on the subject, the book presents the proven methods for the rediscovery of real property boundaries. Grounded in historical documentation, field investigation, and recreation of the original surveying methodology, the book contains the appropriate and legally defensible tools needed for the re-establishment of land boundaries.

Thoroughly revised and updated, the classic text contains fresh examples of case law, the most recent developments in forensic investigation in the discovery of obscured evidence, as well as a new chapter on emerging technology used in boundary surveying. Designed for use by both working surveyors and aspiring professionals studying for the Fundamentals of Land Surveying licensure exam, this important book:

- Has been the leading guide to land boundary law and evidence for nearly 60 years
- Contains new case law examples and exhibits
- Offers expanded coverage on the use of forensic investigative techniques
- Presents a new chapter on the most recent surveying technology

Written for practicing surveyors and students, the updated Seventh Edition of *Evidence and Procedures for Boundary Location* continues to offer an authoritative guide to the principles, laws, and latest developments in the field.

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WILSON
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SEVENTH EDITION

WILEY

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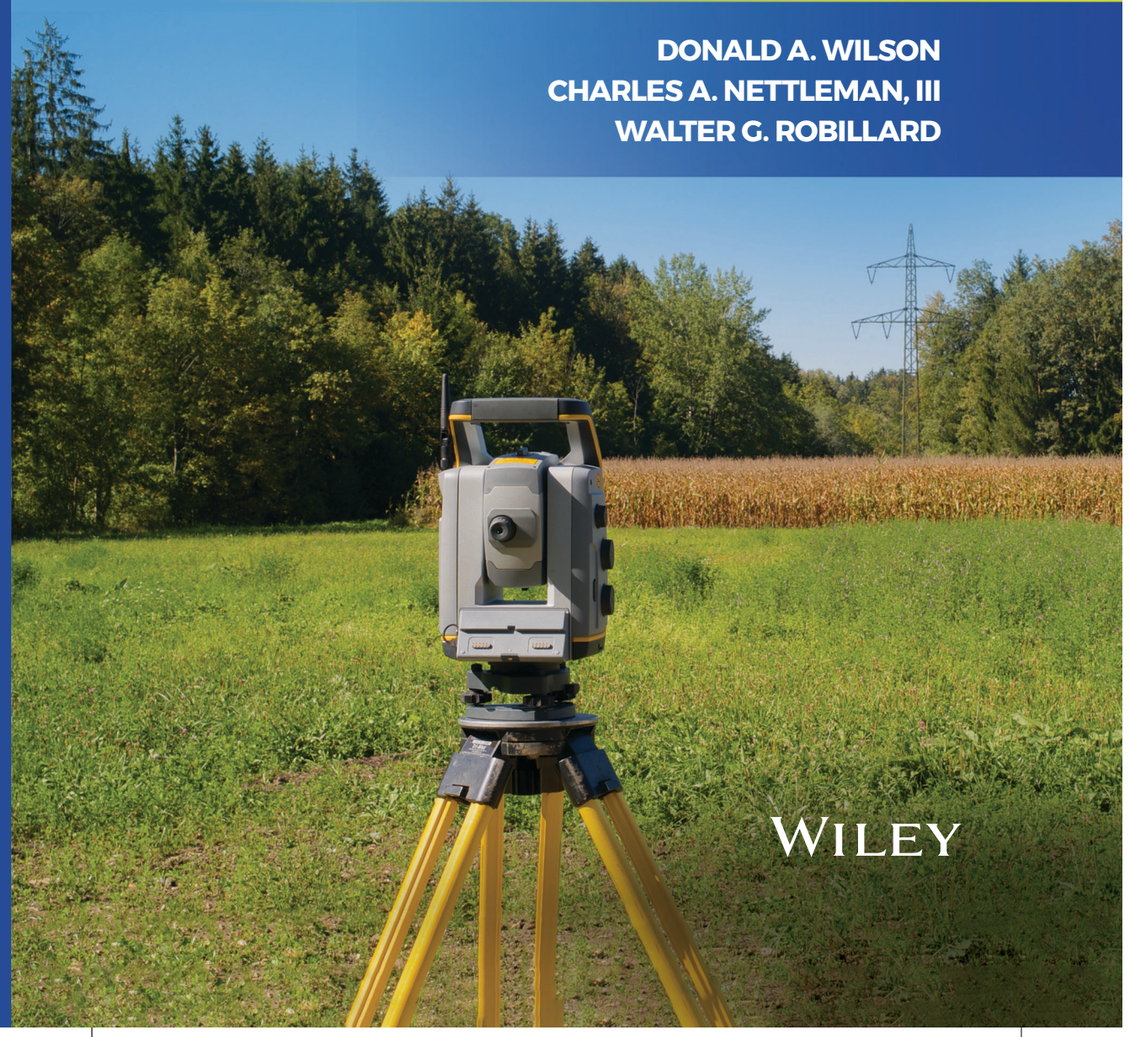

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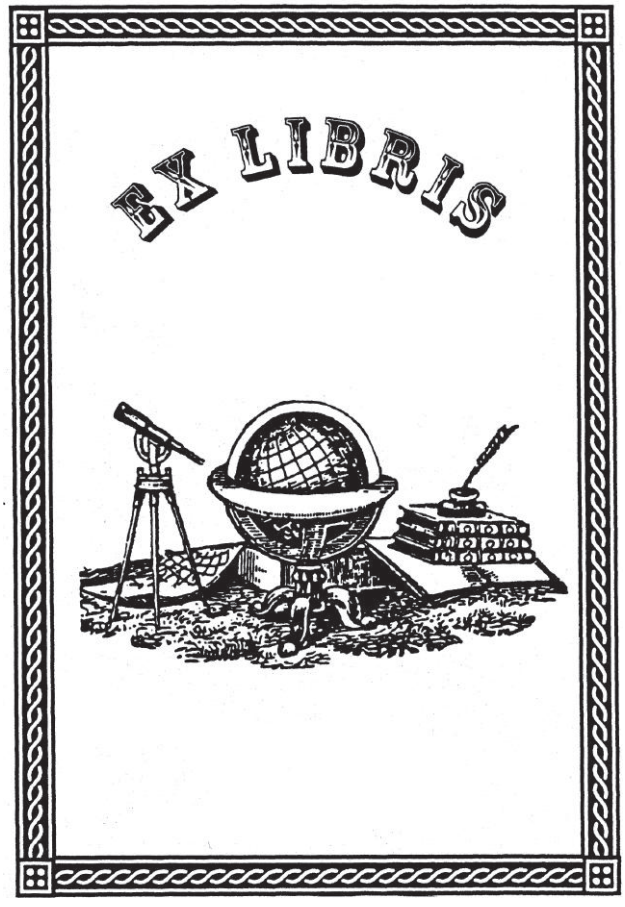

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Seventh Edition

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Based on the original concept of Curtis M. Brown

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PREFACE

Now in its seventh edition, *Evidence and Procedures for Boundary Location* has evolved over the years into an expanded version of Curtis Brown's original vision. Based on a comment made at the 1948 annual meeting of the American Congress on Surveying and Mapping, and joined by Winfield Eldridge, the authors wrote in the Preface to the first edition in 1962: "It is strange and sad that ours is probably the only profession in the country that has no book devoted specifically to the profession. There are a number of textbooks on surveying, but there is no textbook that is keyed directly to the practicing property surveyor. Such a book has not as yet been published though recent works have partially closed the gap. Much still needs to the done to provide the profession with comprehensive practical coverage of the field of property surveying" (*Surveying and Mapping*, vol. IX, no. 4 (1949), p. 291).

In 1958, the annual conference of the California Council of Civil Engineers and Land Surveyors made a request to Curtis Brown, a licensed California land surveyor, to prepare text material directed toward professional surveyors. It became advisable to increase the scope so as to have a text applicable to all areas of the United States, so in 1960, Winfield Eldridge of the University of Illinois was invited to be a co-author. Together, they accomplished their task, and in 1962 saw the first edition come to print. After the untimely death of Professor Eldridge in 1966, Curtis Brown invited Walter Robillard of Georgia and Donald Wilson of New Hampshire as co-authors, so that, in his words, the eastern part of the United States with its differences from the public land states, would be well represented. As the three authors worked to refine the overall text to include new principles and take advantage of changes in technology, the book has now arrived at a revision of the sixth edition, in this seventh edition, incorporating new ideas and challenges. In a profession such as ours, with

continual changes and improvements, a technical publication soon becomes outdated and must constantly be revised to remain current. Technology advances and the law evolves accordingly.

The aims of this title have always been threefold: (1) the recognition and presentation of evidence in accordance with legal principles; (2) a study manual to aid the student in learning the details of property surveying; and (3) a reference manual for the practicing surveyor to offer guidance when faced with conflicts and difficult situations. As a testament to its usefulness, the book has been consulted and cited by numerous courts at all levels throughout the United States. This edition, following in the footsteps of Brown, Eldridge, and Robillard, endeavors to keep true to the existing goals and bring the text material to meet the demands of a new frontier in property surveying.

It would also be remiss not to thank George Cole for his help with the water boundaries chapter in previous editions. In keeping with the original vision, all authors and contributors to the various editions have been licensed land surveyors, writing for other land surveyors and those in related disciplines who rely on surveying and surveyors.

Dr. Tony Nettleman
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1

INTRODUCTION

1.1 Scope of the Book

In writing any book, authors should have a goal or philosophy as to what it is they wish to accomplish. We have such a philosophy: It is our desire to help the student and the practicing surveyor, as well as those aspiring young people who wish to enter the surveying profession, appreciate some of what we feel are the finer aspects of surveying, that is, the legal aspects as well as that area of the law that relates to and encompasses evidence in all of its aspects.

This is a book about survey evidence and, as such, it is not a book on "how to survey" but what to do with your survey when it is completed and what your clients can expect from your survey. Many consider the surveyor as the individual standing behind a transit or theodolite turning angles or collecting data for a new road or measuring for a new subdivision. This book will have a double focus: First, it is aimed at those students who wish to enter the surveying profession and at those surveyors who locate boundary lines and land parcels or utilize evidence in searching for and locating the footsteps of the earlier surveyors who originally created the parcels or property.

Second, we wish to provide a reference textbook that future professional land surveyors may use as a study guide to prepare for their Fundamentals, Principles & Practice, and state-specific examinations. In writing this book, the authors have attempted to modernize the format to be more in keeping with the legal texts of today. The authors have attempted to make the references and the terminology consistent with legal courses to be in keeping with the modern approach. In this we have tried to modernize the land surveyor's responsibilities and liabilities.

The functions of land surveyors should be considered as varied and different in each state. For simplicity, boundary surveying can be divided into two general areas

or disciplines: (1) locating or relocating originally described parcels of land; and (2) creating new parcels. In keeping with recent legal decisions, we have somewhat modified some of the terminology. For instance, seldom is the term *property line* or *property boundary* used. It is our belief that property rights, including property boundaries, are legal questions and as such are not addressed by land surveyors. Surveyors locate boundaries, or land boundaries or deed lines. They do not and cannot locate property rights.

Corners and the lines connecting those corners define the extent of property rights that are described in the land description. These lines may coincide with property rights or they may be separate and independent. These originally created lines remain fixed and unalterable except as provided by law, such as the loss or gaining of property rights or the addition or elimination of contiguous parcels of land in the same ownership.

This concept is what gives rise to the phrase "following the footsteps" because a parcel, once established, should remain fixed through any series of conveyances. This phrase is historical in that many earlier decisions coined the phrase, which now has been adopted and adapted by modern-day courts in rendering decisions. A grantee who acquires a parcel owned by a grantor determines the boundaries of his/her purchase at the time that the particular parcel was carved out of some larger tract. He or she takes to the bounds of the estate of his or her grantor, who, in turn, took to the limits of that grantor's estate, to the time of the creation of the boundaries [1].

The first portion of the book (Chapters 1–11) covers resurveys or retracements of former surveys based on the record; the latter part (Chapters 12–19) covers the creation of new parcels or the division of land in which the surveyor may create the record. The importance of evidence in both phases will be stressed in the following pages.

The first problem one encounters is in the definition of *surveying*. No two states or the federal government or the international community describe surveying in the same terms; nor do they have the same requirements for one to become qualified to create, identify, retrace, and then testify in judicial tribunals as to boundaries or to survey real property.

How original surveys are made is subject to control by the legislative branch of the government, and since there are 50 states and the federal government, land subdivision laws and regulations of original surveys are extremely variable and usually are regulated by standards, statutes, rules, and regulations. However, after parcels have been created and the land has been divided and described, it is left to the courts to interpret the position of the original boundaries. Today, practically all original surveys must begin from a survey of an existing parcel. For this reason, the first portion of the book pertains to the location of previously described parcels. It deals with the evidence and methods for locating these corners, lines, and parcels.

In attempting to survey and locate a described parcel of land, the only permanent and correct location of its boundaries is where a court of competent jurisdiction would locate them. To know where a court would locate property boundaries, the surveyor must have expert knowledge and understanding of the laws of boundaries and evidence. Yet regardless of where the surveyor would locate the boundaries of

the parcel, the final location of any boundary is nothing more than an opinion of the evidence recovered, evaluated, and then interpreted, and this is always subject to review by the courts and by other subsequent surveyors.

Once a boundary is questioned or litigated and the parties seek determination by a jury, the trial is usually divided into two parts: It is left to the jury to decide what the facts are and it is left to the judge to apply the law to the facts. This has led many courts to hold to the old saying: "What boundaries are is a matter of law; where boundaries are is a matter of fact."

Thus, in a trial, the jury decides where an original monument position was located based on evidence the surveyor used to formulate an opinion. The judge decides whether the monument or measurement is controlling as a matter of evidence presented at the trial and not necessarily as a matter of law. In a survey based on the record, the surveyor may be asked to determine both of these questions, either knowingly or unknowingly. Chapter 2 examines the laws of evidence necessary to prove facts and the order of importance of discovered evidence.

According to the *Statute of Frauds* first enacted in England in 1677 and later adopted both in statute law and common law in the United States, land ownership must be proven by some form of written evidence. To prove the right of legal possession, a written document must be produced witnessing such right. In early decisions, courts found that the requirement for written deeds sometimes caused an individual to commit fraud; thus, the concept of title passing without a writing was created, yet English courts recognized a concept from Roman law, adverse possession, by calling it an unwritten title. Since a legally created unwritten title is legally superior to a written title, one may say that the written title is either extinguished or reduced in status to a junior interest.

In recent years, a marked change has occurred in the courts' thinking on the subject of professional responsibility and liability. The concepts of privity of contract and the time of commencement of the running of any statute of limitations are vastly different from what they were 50 years ago. Chapter 16 and a portion of Chapter 17 discuss these subjects with the hope that student will be able to limit or possibly escape professional exposure for liability when entering the profession.

According to decisions reported in court cases, surveyors, in retracing old boundary lines, are directed and obligated to follow the "footsteps of the original or creating surveyor"; therefore, it is essential that any surveyor who practices in the area of property or boundary identification has knowledge of the historical background of land surveys in general and the geographic area specifically and that he or she know under which laws they were originally performed. The authors believe that the term *footsteps* equates to a question of *evidence*: evidence created and then evidence recovered. Evidence will be discussed to include many facets. The purpose of discussing surveying history in Chapter 9 is to aid present-day surveyors in understanding why we must follow certain procedures when locating property boundaries. Even this history must be used as a tool for the present and not as a device to present the romance of the past. Exploration of historical background and the study of the development of various survey systems and equipment will provide the needed background of laws and customs governing property owners' rights and privileges.

Although surveying history will be shown to be quite ancient, it does not overlook the fact that the United States is rich in many phases of the history of surveying and law that have widespread application within the individual states, territories, and the United States proper:

1. the English system that gave rise to English common law, which was used in the colonies and now forms many of the fundamental rules, as well as civil law, which evolved from Roman law and was subsequently referred to as the Napoleonic Code and is still found in vestiges in most of the remainder of the United States;
2. the Mexican and Spanish land grant systems;
3. the French system, used in the Louisiana Purchase area and elsewhere;
4. the sectionalized land system of the public domain;
5. land divisions under state laws, especially in Texas and some of the eastern seaboard states; and
6. the various other systems that developed in states such as Georgia and Maine.

The intent and meaning of the words in a deed should always be interpreted in the light of laws, words, and conditions existing at the date of the creation of the document. In New York, under Dutch rule, land dedicated for road purposes passed in fee title to the Crown. New York, on acquiring the streets, retained the fee title; hence vacated, former Dutch streets revert to the state. The same can be said of Texas roads dedicated during Spanish or Mexican control [2]. The ownership of stream beds or bodies of water is often dependent on which nation had jurisdiction at the time of the land's original alienation and on the effect of the laws in force at the time of the grant. An indispensable part of all boundary location is knowledge of the history of the development and settlement of the area. With this idea in mind, Chapter 8, on evidence of water boundaries, has been totally rewritten.

With a foundation of the historical development of real property and surveying, the surveyor or the student will have an opportunity to expand their knowledge by learning the procedures used in locating already described parcels and procedures used to create new parcels, including suggestions as to how to describe parcels in writings. If the reader feels that some of the aspects of property surveying appear to be treated too briefly or are not mentioned at all, it may be because these topics have been adequately discussed in other works previously published and available to the practitioner and student.

1.2 Definitions of Surveys and Surveyors

The terms *survey*, *surveying*, and *surveyor* have broad and possibly confusing connotations; the average citizen becomes confused when a survey is conducted as to public opinion but then sees a surveyor measuring the lot next door. We recognize that the term *survey*, without more exacting words, describes procedures as well as vague studies. Simply stated, the word *surveying* may have numerous implications.

First, being the verb: "I am surveying a description of a parcel of land." Then, going from verb to noun, a surveyor can state, "Here is my survey." Finally, the same word may be used as an adjective with the phrase "Here is my survey plat." When used with other terms, such as *land*, *property*, *boundary*, *geodetic*, or *cadastral*, the term then becomes more definite and can be discussed and is pertinent to the subject of this book. The word *cadastre* is defined as an official register of the quantity, value, and ownership of real estate used in apportioning taxes. *Cadastration* is the act or process of making a cadastre or cadastral survey. Cadastres and cadastral surveys are concerned with land [3], law, and people [4]. In popular use, land surveying is defined as the determination of boundaries and areas of a tract of land.

A *boundary survey* is understood by some as a survey that is conducted for the location and establishment of lines between legal estates, or it may be a physical feature erected to mark limits of a parcel or political units [4] and a *cadastral survey* is confined to the location and subdivision of the public domain [5]. To minimize confusion, the term *property surveying* may be used interchangeably with *boundary surveying* or *boundary line*. As such, the terms may not be considered as denoting property rights but may be employed throughout this book to denote the activity of locating, establishing, and delimiting boundaries of real property. The practice of property surveying is defined in many of the state registration and licensing laws. Such definitions usually include the measurements of area, length, and directions and the correct determinations of descriptions, especially when such property is to be conveyed or when the instrument of conveyance is to become a matter of public record.

Although not applicable here, we must mention that to the general public the term survey may address an opinion poll or political analysis, which may add additional confusion. The National Council of Examiners for Engineering and Surveying (NCEES) defined *land surveying* to mean the performance or practice of any professional service requiring education, training, and experience in the application of special knowledge in the mathematical, physical, and technical arts and sciences to such professional services as the establishment or relocation of land boundaries, the subdivision of land, the determination of land areas, the accurate and legal description of land areas, and the platting of land subdivisions for record [6].

In a model registration law approved by NCEES, the following statement appears [7]:

> The term Land Surveying used in this act shall mean and shall include assuming responsible charge for and/or executing: the surveying of areas for their correct determination and description and for conveyancing; the establishment of corners, lines, boundaries and monuments; the platting of land and subdivisions thereof including as required, the functions of topography, grading, street design, drainage and minor structures, and extensions of sewer and water lines; the defining and location of corners, lines, boundaries and monuments of land after they have been established; and preparing the maps and accurate records and descriptions thereof.

The American Congress on Surveying and Mapping (ACSM), now the National Society of Professional Surveyors (NSPS), jointly published *Terms & Definitions*

of Surveying and Associated Terms in 1978 with the American Society of Civil Engineers (ASCE). The current edition, revised in 2005, provides the following definition of land surveying:

Land surveying is the art and science of

1. retracing cadastral surveys and land boundaries based on documents of record and historical evidence;
2. planning, designing, and establishing property, land, and boundaries; and
3. certifying surveys as required by statute or local ordinance such as subdivision plats, registered land surveys, judicial surveys, and space delineation.

Land surveying can include associated services such as mapping and related data accumulation; construction layout surveys; precision measurements of length, angle, elevation, area, and volume; horizontal and vertical control systems; and the analysis and utilization of survey data. In summary, the term *surveying* can be considered an ambiguous word.

1.3 Activities of Boundary Surveyor

Few other countries rely on the surveyor as people do in America. No other country identifies and applies property rights as we do. Property (boundary) surveyors are found in private practice, are employed by federal, state, county, and local government, and are associated with related business. In the past, those engaged in private practice and especially those in rural areas often had small organizations composed of the surveyor with one or more helpers. As a general rule, most surveyors were sole practitioners or employed by small firms. This still applies today. In larger cities and in densely populated areas it is not uncommon to find large surveying firms preparing subdivisions and locating parcels of land for sale. Many land surveyors have found that a small organization in a country setting is most enjoyable and offers many advantages. In many instances, small surveying firms or organizations have spanned several generations in the same family.

The federal government, through the Bureau of Land Management (BLM), is still engaged in the original subdivision, resurveying, and retracing the public domain; the U.S. Forest Service employs surveyors who are well versed in land surveying, as does the National Park Service, the Fish and Wildlife Service, and military organizations. One of the more important functions of State Departments of Transportation is the location of rights-of-way with respect to adjacent properties. Counties and cities often have similar problems, although confined to a more local area. In a few states, the county surveyor makes private property locations part of his or her official duties; but in other states the county surveyor's responsibility is narrowly confined to county government problems, as defined by the law.

Today many more governmental organizations employ surveyors or survey advisors for geographic information system (GIS), land information system (LIS), and global positioning system (GPS) work. The surveyor may not necessarily confine his or her work to property, boundary, surveys, often mapping topography and staking

the outline of engineering projects such as buildings, sewer lines, water lines, curbs, sidewalks, and paving. Although these are important technical functions, they will not be treated in this book. This textbook will primarily be devoted to the location of boundaries of parcels of land. The modern surveyor will be intimately involved in creating maps or descriptions for GIS–LIS projects or acting as a consultant for the design or such projects. GIS should mean "get it surveyed."

1.4 The Surveyor in Society

History supports the fact that the practice of surveying, including property surveying, is as ancient as property ownership itself. In Babylon, over 3500 years ago, the name of a surveyor was inscribed on a boundary stone, giving testimony to his acts [8]. A visit to the National Museum in Cairo, Egypt, will expose the visitor to a tomb of a surveyor. In the National Museum in Athens, Greece, as well as in Rome, Italy, one can view the tombstone of a surveyor long dead.

It is recorded that for over 1000 years ancient Rome used surveyors to locate boundaries and survey roads and aqueducts. In fact, the Roman *agrimensores*, namely the surveyor, was required to pass an examination for competency. Because of the nature of surveying and the varied needs, Rome separated the "civil" surveyor from the "military" surveyor.

In early times, surveyors possessed special skills and talents that were regarded with almost reverent respect; they filled a necessary need in civilization, and they utilized the most advanced sciences known to the world. The same Roman surveyors were required to receive special training in the varied aspects of leveling and boundary law while in school. They were guided by a series of textbooks titled *The Corpus* [9].

There is little doubt that the practice of surveying today is a profession and should be performed by and through a professional upholding the standards of the higher meaning of the word. Yet as practiced today, surveying is very different from that practiced by Washington, Ellicott, Thoreau, and Lincoln and their contemporaries. The present rapid development of this country's lands and resources has created a need for professional surveyors, a demand much greater than graduates being supplied by the universities with surveying programs. Today, many surveyors have obtained professional status or recognition by apprenticeship, on-the-job training, and self-study programs, without the aid of much formal education. But as the demands of society become more complex, the surveyor of yesterday will be little recognized by the surveyor of the future. Such regeneration probably will not suffice in the future, and the surveyors will have to come from schools and colleges with students earning formal degrees in the various disciplines of surveying.

Technology development has outpaced the development of the law.

Education was and will be the foundation of the surveyor of tomorrow, while experience was the foundation of the immediate past. In the formative years of the world and our nation, the surveyor was perhaps among the more educated individuals. The

surveyor mastered mathematics, instrumentation, astronomy, and cartography, and he was the explorer and the mapmaker of new worlds. Today the new worlds the modern surveyors will conquer are the technical and the legal worlds.

Like all other professions, the demands on surveyors are more complex and have become greater and more differentiated, the practice of property surveying has to consider inexact laws in addition to exact engineering or measurement sciences. Few problems confronting the property surveyor can be solved completely by applying exact sciences only; answers will depend on law, an inexact science. The development of mature judgment, logic, and meaningful experience will be demanded of the student.

There are no known studies as to why young students wish to devote their lives to the profession of surveying. What type of person does this profession appeal to was best explained over nine decades ago by A.C. Mulford who finalized the book *Boundaries and Landmarks* with the following statement [10]:

> Yet it seems to me to a man of an active mind and high ideals the profession is singularly suited; for to the reasonable certainty of a modest income must be added the intellectual satisfaction of problems solved, a sense of knowledge and power increasing with the years, the respect of the community, the consciousness of responsibility met and work well done. It is a profession for men who believe that a man is measured by his work not by his purse, and to such I commend it.

Surveyors look with pride to the many famous men in history, including several presidents, who have been engaged in surveying as a profession during their lifetime. Property surveyors, perhaps more than their associates in engineering, are in constant contact with people. This gives the property surveyor an opportunity to present a professional image as a member of a profession with superior standing, integrity, and knowledge. Awareness of the many responsibilities and a conscientious fulfillment of professional obligations will enable the property surveyor to maintain a status in society.

1.5 Current Need for Surveyors

In the United States and now in other areas of the world there are millions of people with many basic needs that involve land. Food and minerals and fiber and forage are derived from the soil. All substances that go into essential goods are products of the land. Rain must be conserved and controlled as it falls on the earth. Lakes and rivers provide transportation, irrigation, and energy for those who live along their shores. Yet surveying is more than just the surveying of a lot or a subdivision. The various areas of surveying and what they bring to humanity is one of the basic needs of all peoples.

This century has been highlighted by many spectacular advances in technology. Structures, buildings, bridges, and tunnels, as well as dams and highways, all of which are located on land that has been here for millennia, require surveys or measurements. When these structures disappear, the land on which they stood will still be

there. When miles of new highways are constructed, the location will depend on and require miles of new property lines to be located or surveyed and described!

An exploding population is creating demands for more and more residential lots. New land developments containing 50,000 home sites and small subdivisions with only a few lots are being created. For each parcel of land, there are owners' rights and privileges extending to the limits of their property, both skyward and to the depths of the Earth. These requirements are requiring that surveyors identify division lines on, below and above the Earth's surface. With expansion, a community requires additional lands for public and municipal purposes, such as waste disposal, service utilities, parks, schools, and rights-of-way.

In the early years of the country, real property sold for $1.25 per acre or less; today, portions of that same land may have values in excess of $2 million per acre, and some land is valued in terms of thousands of dollars per front-foot or square foot. Even "poor" land in rural areas may bring $1000 per acre or more.

Of the thousands of surveyors in the country today, many are not prepared to cope with these crucial problems, either technically, educationally, legally, or experience-wise, and, even if they were able, the numbers of trained and qualified surveyors are not sufficient to satisfy the needs of the growing population. This book is written with a twofold purpose in mind: first, to help those in practice to better understand the professional problems that are present and, second, to aid the surveying student in preparing for a profession that can be as rewarding as the engineering, medical, or legal profession.

1.6 Future Needs for Surveyors

No one can accurately predict the problems of the future, but some of the needs can be anticipated and prepared for accordingly. Certain needs are obvious. The population will increase, and thus more efficient use of land must be made. As the costs of land spiral upward, the delineation of property lines will become more critical. New divisions of land will continue to be made each day, and the ancient surveys will have to be identified and retraced. These divisions will not only be horizontal but also vertical. We will build upward as well as downward.

Even in the future, the property surveyor must not ignore the past, for a professional's problems go back as far as land ownership itself. If we will not learn from the mistakes of yesterday, we will provoke headaches for tomorrow, and new surveys must be performed more accurately and with greater precision. Rare are the areas where the value of real property has not risen considerably over the years. In addition, now that communism has failed, large areas of once communally held property will be divided and placed into private ownership.

The property or boundary surveyor of tomorrow will need to exercise far more technical skill and more in-depth knowledge of the law and use legal judgment than the professional surveyor of today, yet the modern surveyor must have an understanding and knowledge of the law. Just as the compass and chain are gone, the transit and tape are not sufficient to cope with future problems. Modern technology has developed many marvelous devices and techniques with which to make more

precise surveys and aid in studying and solving property surveying problems. Such tools as photogrammetry, electronic computers, and microdistance devices are now commonplace. The surveyor will use new terms such as GPS, GIS, LIS, and perhaps some that have not yet been coined.

It is hoped the student surveyor will not lose sight of the fact that technology cannot replace hard work and experience that can only be gained from the exposure to field exercises and the necessity of having an understanding of the law. It is possible that the property surveyor of tomorrow will locate title boundaries many fathoms under the sea or meters above the ground. He or she may need to subdivide the Antarctic continent. Whatever are the problems, the property surveyor will need to be armed with all the tools, knowledge, and education of the profession and have the ability to exercise sound and mature reasoning.

One fact is certain: Education is the foundation of tomorrow's surveyors. Today, surveying programs are directed toward two general areas: one predicated on course-oriented subjects in modern aspects and a second directed toward basic education courses supplemented by extensive field training. There is no present answer as to which of the two will produce the better surveyor of tomorrow.

What the authors do see is that the surveyor of tomorrow will be more closely oriented toward the legal aspects. Surveying should be considered to be a combination of three separate and distinct areas: technical, legal, and administrative, professional, or business. Although each of these is separate, they have a common area of overlap in which all three are interrelated. Many textbooks adequately discuss the technical, and in most college courses, the technical aspect is thoroughly taught and examined, but the business or administrative and legal areas have few references to aid the student and surveyor. It is hoped that this book will meet this need for the student and the practicing surveyor (see Figure 1.1).

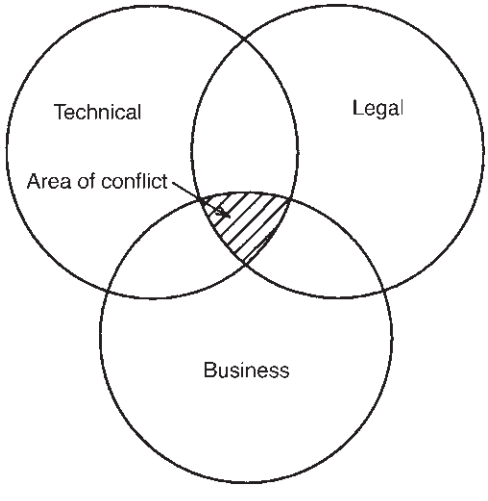

FIGURE 1-1. Three disciplines of surveying.

1.7 Land Data Systems

At this time, the need for restructuring and reorganizing the land data systems existing in most states is urgent. Most, if not all, states employ land systems that are antiquated and cumbersome. In some counties, land records are deplorable. The move toward modernization of land data systems includes pilot projects in various parts of the country, some of which have been in existence for a few years. Although needed, land data will vary from place to place; yet, the systems in general may be similar in many respects.

Geographic information systems are being introduced in many locales, yet few people realize that the basis of any system predicated on measurement requires, first, an adequate survey framework. Systems index parcels of land according to a unique number taken from a cadastral map, which is based on a rigid framework of horizontal and vertical control. Data are computerized and can include not only title information and deed descriptions but also information concerning natural resources, zoning, and the like. Most recording offices now use microfilm as a necessity for saving space.

Most countries are now using some type of computerized system. With advances being made in GISs, LISs, and GPSs, the coordination of land data of any nature is now faster, more accurate, and more readily available to the surveyor and the consuming public. In addition, the retrieval of such data is routine in many offices and governmental agencies and in some areas is available to the consuming public on a 24/7 basis. Sophisticated computer hardware and software are being developed and modified to meet any budget or need.

Surveying and engineering offices are moving rapidly toward computerization, microfilming, and retrieval of records to conserve time and storage space and to increase accuracy of the record. Database management programs are being designed to fit the needs of most offices, no matter how large or small.

The thrust of this book will be in the legal dimensions, along with some of the business aspects of the surveying profession. Surveyors should be an integral part of the development and maintenance of land data records; they should be the ones to see that the evidence of monuments and their position are included with all other information that has become a matter of public record.

The future in the land data systems, in GIS/LIS, and all other new systems will rest on a group of professionals. If surveyors are to lead, they must take the initiative and not let the system pass them by. In the world of tomorrow, there will be no place for the hesitant, for they will be lost. Those who do not look to the future will earn their "Doctorate of Plane Table Technology."

1.8 Global Positioning Systems

Surveyors have found a new useful tool with which to measure lines and locate positions. Like all tools, some believe a new innovation called *global positioning systems*, or GPS, will revolutionize their practice. However, caution is always advised, since all tools have their shortcomings and limitations. Although GPS will permit

long-distance surveying far faster than ever before, and makes distance ties and surveys of six-mile lines practical for small-area surveys, there is still no substitute for ensuring the measurements between points or the occupation of points, or positions. It cannot be overemphasized that there is only one correct point for a corner, whether marked or not, and it is the position where it was originally placed that controls above all.

GPS, being a measurement tool, is subject to the same rules of law and technology as all other measurement tools of the past. For, after all, the GPS unit used today is nothing more than the historical extension of the Roman groma or the dioptra of Heron of Alexandria's era. Courts have always ruled that measurements are the least reliable of all items of evidence, and that they should only be used as a last resort. Measurements contain error; original corners (positions), by law [11], are without error.

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2

DEFINITION, SCOPE, AND NATURE OF EVIDENCE

2.1 Historical Concept of Evidence

In retracing prior surveys, regardless of their ages, evidence becomes paramount in being able to identify and locate both large and small parcels of land. Often the practicing surveyor, the attorney, and perhaps even some courts will find it difficult to make the distinction between facts and opinions. Evidence of land surveys takes many forms, including instrument measurements and physical objects. The interpretation, or the acceptance or rejection of that found evidence, is quite difficult. Evidence is a foundation for attorneys in that one of the first courses law students are required to master is on the Federal Rules of Evidence (FRE) and Federal Rules of Procedure (FRP). Surveyors may not be familiar with the FRE or FRP rules, but we often use rules within them, including the ancient documents rule. The search for and discovery of evidence are important. But the presentation of the found evidence is often just as important. Often, cases are either lost or won due to the presentation of the evidence through the teamwork of the attorney and the surveyor expert witness.

THERE IS NO TECHNICAL OR LEGAL SUBSTITUTE FOR FOUND ORIGINAL EVIDENCE.

"Evidence, its use, identification, and application are a team effort between the attorney and one who may be called his co-worker." This was paraphrased from a comment made nearly 100 years ago by A. C. Mulford.

The surveyor may create original evidence, identify it in a retracement, and catalog it for use by the client or in a judicial tribunal, but the attorney must have the ability to effectively use it and get it accepted by the court. Evidence is worthless without the unified harmonious teamwork of the attorney and the surveyor.

Historically, most early rules of evidence were judge-made, in that each jurisdiction and each judge in that jurisdiction were permitted to interpret and apply the rules for admitting evidence in their court rooms. In fact, there were major differences in the admissibility of evidence within the same jurisdictions, and as such, most rules of evidence accepted by the courts were closely tied to English common law.

After many years of chaos, an effort was made in 1942 to develop a codification of the *rules of evidence*. Unfortunately, they received little support from the various states. Then in 1975, the U.S. Supreme Court developed rules that were adopted by Congress that became the rules of evidence in federal courts. These *Rules of Evidence for U.S. District Courts and Magistrates* are in effect today and only apply to the federal courts.

Subsequently, individual states either adopted these rules in their entirety or adapted them to suit regional or state-specific needs. Currently, all states have rules of evidence as part of their civil and criminal court systems.

In essence, these rules, whether federal or state [1], for the most part are attempts to codify existing common law. As such, it becomes necessary that the students not only know the codes that identify evidence but also have knowledge of the case law of evidence from which these rules evolved. From these sources, the students will come to appreciate the importance of evidence in surveying or creating, as well as retracing boundaries.

All survey or boundary questions can be categorized into three areas:

1. Questions of fact, to be ascertained by the jury.
2. Questions or propositions of law, to be determined by the judge.
3. A combination of the first two.

In most litigation, questions of fact may exert greater influence on the ultimate outcome or decision of a boundary problem than will questions of law. *Evidence* is the material that is *offered* to persuade the jury, which is the trier of facts, that certain events are true. In a bench trial—that is, a trial without a jury, having only a judge—the judge becomes the trier of fact.

Although there are many definitions of evidence, which will be discussed later, perhaps a modern definition should be examined. To understand better what evidence is or is not, various historical legal experts should be consulted.

The student and the surveyor must first make a distinction between facts and evidence.

The actual corner point is a fact, along with all the information used to create, identify, describe, recover, or preserve that point that is evidence of that one unique point, the corner.

The discussion of evidence for the student may seem complex and difficult, but this is far from so. To make it more understandable, the topic of evidence has been separated into chapters. Once the student becomes a registered surveyor, the failure to understand the rules of evidence and to apply them in the retracement of boundaries

and other aspects of surveying could possibly result in that surveyor being investigated by various licensing boards or in having a claim of malpractice brought against the individual [2].

First, in layman's words, *evidence* can consist of almost any object, action, or verbal statement, either oral or written. The *laws of evidence* consider the admissibility, effect, and relative importance of the evidence produced. A found monument is evidence; the control afforded the found monument is determined by the laws of evidence. Evidence and the laws of evidence are, of necessity, closely related, and the discussion of one invariably must include a discussion of the other.

In a broad sense, a discussion of evidence and the laws of evidence could include most phases of the boundary surveyor's practice. Initial land transfers must be in writing. Writings are evidence. Measurements are evidence to prove or to disprove where deed lines or corners are located. Evidence of possession may be proof of an unwritten conveyance, but it may also be used to show possession of unwritten rights. Scientific principles are evidence, as is judicial notice that is accepted by a court.

Although entire books have been written describing evidence [3], discussing it here would not be a logical approach for students or for surveyors. This chapter is devoted to the fundamental concepts of evidence and the laws of evidence. Later chapters will be devoted to discussions of the amount, kind, and sufficiency of evidence necessary to prove certain facts of prior surveys and of evidence that identifies prior boundaries. These volumes should be a part of any land surveyor's reference library.

One will find a distinction between the meaning of the word as used by surveyors and as used by legal scholars and the courts. Regardless of the definition, it can be said that there is no single good or positive definition of evidence. To have the student appreciate the problem, Bentham defines evidence as follows: "Evidence is any matter of fact, the effect, tendency or design of which is to produce in the mind a persuasion affirmative or disaffirmative of the existence of some matter of fact" [4].

This definition is important in that it is one of the very first definitions indicating what the witness's responsibility is as to evidence. The witness is a *storyteller*. He or she must present, through guidance by the attorney, a story linking the history of the evidence to the evidence found in order to produce a fact in the minds of the judge or jury. Unless the surveyor can effectively communicate his or her knowledge of the evidence to today's problems, facts may go unproven.

In more limited terms, evidence as used in legal proceedings and the courts has variously been defined as follows:

- Blackstone states, "Evidence signifies that which demonstrates, makes clear, or ascertains the truth of the fact or point in issue, either on one side or the other" [5].
- Greenleaf wrote, "Evidence is legal acceptance and includes all means by which any alleged matter of fact, the truth of which is being submitted to investigation, is established or disproved" [6].[1]

- Thayer wrote, "Evidence is any matter of fact which is furnished to a legal tribunal, otherwise by reasoning or a reference to what is noticed without proof, as the basis of inference in ascertaining some other matter of fact" [7].[2]
- The judicial scholar Wigmore writes: "Evidence represents any knowable fact or group of facts, not legal or a logical principle, considered with the view to its being offered before a legal tribunal for the purpose of producing persuasion, positive or negative, on the part of the tribunal, as to the truth of a proposition, not of law or of logic, on which the determination of the tribunal is to be asked" [8].
- The California Evidence Code defines evidence as "Testimony, writings, material objects, or other things presented to the senses that are offered to prove the existence or non-existence of a fact" [9].

Most of these definitions were written for attorneys and the courts, and these definitions lend themselves to the lawyer's and the court's definitions. However, to summarize the bulleted definitions, the surveyor should consider evidence as follows: any document, object, writing, action, thing, verbal statement, or other information that is identified to prove the fact that is in question.

It is *evidence* that perpetuates the location of corners and boundaries. Seldom does the investigator, *and the person who makes the subsequent evaluation of the evidence*, have clear facts—the older the boundary, the less clear it may be. Its evidence is of prime importance in finding its precise location. Whatever remaining evidence there is must be interpreted to determine what was established at some point in the past.

If one tried to summarize the definition of evidence in a neophyte's language or in the simplest words that can be used a simplistic definition could be as follows:

> Evidence is ANYTHING for which the effect, tendency, or design is to produce in the mind of a person a persuasion—either affirmative or negative—of the existence of some matter of fact.

2.2 Surveyor's Role in Evidence

A surveyor is intimately involved with evidence from the creation of the original survey to its subsequent recovery by a retracing surveyor. The span of time between the two may be a few days or many decades or possibly a century or more. Many things can happen from the time a surveyor creates the evidence until a retracing surveyor, acting as a witness, is asked to recover it, interpret it, and explain it to a client, an attorney, or a court of law.

The recovery of evidence and its use by a surveyor form but one function or stage in a complex chain. The chart in Figure 2.1 is an attempt to give readers insight and to provide an opinion as to what we see as the role of the surveyor in the area of evidence.

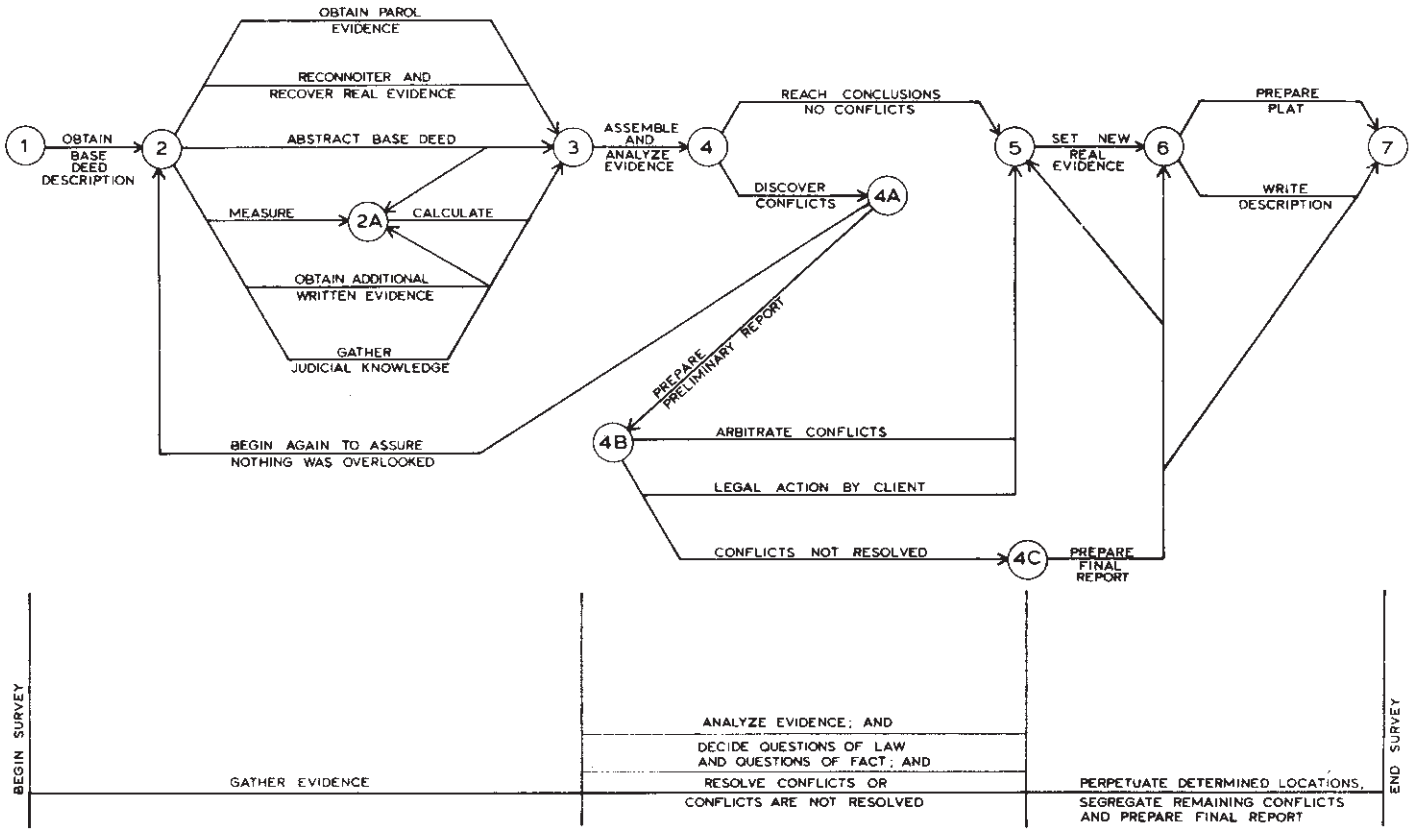

FIGURE 2-1. Land survey procedural network.

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First, the surveyor obtains the task to be accomplished for the client. The request is either oral or in writing. The basic request determines what evidence is available and what evidence should be looked for and to be used in the retracement of the parcel. After obtaining the scope of the work to be performed, the surveyor should identify a list of the referenced documents and search the records for them. This may include adjacent parcels that may have an effect on the lines to be surveyed. Then, and only then, should the surveyor commence field investigation to possibly conduct measurements (one form of evidence) to relate these measurements to objects called for in the record documents, as well as any uncalled-for monuments that may be found. After all of this is completed, the retracing surveyor must then draw a conclusion from the called-for information and the found information; if the surveyor is unable to do this, then he or she must seek additional information. This brings the surveyor to phase 5 of Figure 2.1.

2.3 Scope

The laws of evidence not only include the definition of evidence but must, of necessity, also include the effect of evidence and the competency of a surveyor to do the following:

- Recognize what is evidence.
- Evaluate the validity of evidence found.
- Make a conclusion from the found evidence to prove the boundary corners or other points in question.

A summary of terms used by the courts to determine the effect of evidence and what rules determine the amount of evidence necessary to produce the persuasion in the surveyor's and/or the court's mind is provided later in this chapter under "Best Available Evidence."

The principles discussed in this chapter are as follows:

PRINCIPLE 1. *A surveyor should learn and understand the basic rules of evidence for his or her state as well as The Federal Rules of Evidence.*

PRINCIPLE 2. *A surveyor must objectively analyze each piece of evidence, no matter who hired the surveyor; he or she should consider every plausible alternative before accepting a document, monument, or any other form of evidence.*

PRINCIPLE 3. *An expert surveyor's opinion is predicated on the evidence that is considered at the time the opinion is formulated. Change the evidence, and the opinion may also change.*

PRINCIPLE 4. *The surveyor should never use the adjectives "ALL" or "COMPLETE" or "FINAL" in describing evidence or the surveyor's expert conclusions based on*

the evidence. Expert opinions are based on the available evidence. There may be other evidence that was not found by the surveyor or was withheld from the surveyor.

PRINCIPLE 5. *Every survey of a conveyance must start from evidence that proves the position of at least two consecutive monuments somehow related to the written record.*

PRINCIPLE 6. *Evidence is not proof. Evidence leads to proof. A consideration of sufficient evidence and conclusions to be drawn from evidence, in accordance with the law of evidence, may produce proof.*

PRINCIPLE 7. *The affirmative party or plaintiff in a civil case has the duty of presenting sufficient evidence to convince either the judge or jury of the allegations. He or she has the burden of proof. A defendant has no obligation to present evidence.*

PRINCIPLE 8. *In civil cases that deal with boundary issues, it is not necessary to prove "beyond a reasonable doubt" as in criminal cases; it is only necessary to prove a "preponderance of evidence."*

PRINCIPLE 9. *A person claiming adverse possession, acquiescence, or loss of property rights usually must present clear and convincing evidence.*

PRINCIPLE 10. *A survey may be proved by any evidence of facts that are relevant and material, but this evidence may not be admissible.*

PRINCIPLE 11. *A surveyor is concerned about the relevancy of the evidence and not the admissibility of the evidence.*

PRINCIPLE 12. *A surveyor must be careful to make the distinction between a forensic survey and a utility survey when working with evidence. The evidence may be the same, but the manner in which it is presented and used may be different.*

PRINCIPLE 13. *Surveyors are presumed to know the laws of evidence pertaining to the location of land boundaries described by writings, and they are charged with the responsibility of knowing how to apply the laws of evidence when they locate deed boundaries.*

2.4 Importance and Necessity of Being Impartial

PRINCIPLE 1. *A surveyor should learn and understand the basic rules of evidence for his or her state as well as The Federal Rules of Evidence.*

Whenever one practices a profession, the individuals should be knowledgeable about and understand the "rules of engagement." For the retracing surveyor, an

important topic is EVIDENCE. The surveyor creates the original evidence and then describes his or her monuments and accessories in field notes or legal descriptions. Then, many years later, expects some other surveyor to identify and recover this ancient evidence that has been hiding in plain sight for years or decades. It is imperative that the creating surveyor use standard practices in setting and describing the new monuments so that the retracing surveyor knows what to expect when they begin to search the property or the records office for evidence of the property boundary. Following the prescribed and accepted rules may eliminate individual or personal biases that may be present.

PRINCIPLE 2. *A surveyor must objectively analyze each piece of evidence, no matter who hired the surveyor; he or she should consider every plausible alternative before accepting a document, monument, or any other form of evidence*.

Impartiality is a key factor and an absolute for a professional surveying expert. Until the mid-1950s, there were no guidelines as to the uses and presentations of evidence to and in the courts. Congress initiated a study for the federal courts and the resultant document was *The Federal Rules of Evidence* that became applicable to all federal courts. The respective states started either adopting these rules *in toto* or modifying them to suit local desires and needs, so that today all of the federal and state courts have rules of evidence that judges, attorneys, and others must understand, recognize, and use. These rules cover all aspects, from defining evidence, to who can be a witness, to identifying the requirements for expert witnesses.

As a professional who conducts a retracement, the surveyor should remain independent of any disputes or problems. A surveyor who offers an opinion as to evidence becomes "biased" and may be proved as being "opinionated" as to that particular survey. To maintain the aura of being an independent third party and of respectability, the surveyor should leave no stone unturned. Several of the definitions given in Section 2.3 stressed the importance of having evidence on all sides of the question or issue.

The impartiality of the land surveyor in finding and evaluating evidence is key because the land surveyor will absolutely be scrutinized on cross-examination during deposition or trial. During the cross-examination, the opposing attorney's goal is show that the land surveyor (1) fell below the surveying standard of care and/or did not follow standard surveying practice or (2) ignored key evidence in order to purposefully help his or her client win the case. In either instance, the surveyor's testimony may be seriously impaired and cease to be effective if it is determined that both sides of the question have not been explored, considered, evaluated, and analyzed.

Thus, any surveyor who is asked to perform a survey for a boundary problem should always consider the evidence that supports the location of the boundary corner, the evidence that supports other possible corner locations, and then be ready to explain why the preponderance of the evidence supports why his or her opinion is correct.

No surveyor should become an advocate on behalf of any client. The surveyor should approach the evaluation and analysis of evidence in a wholly impartial manner, and, as such, the surveyor should consider all of the positive evidence for the

position and all of the negative evidence. The surveyor should then form the expert's professional opinion based on the totality of the evidence collected and analyzed.

Professional surveyors should maintain an impartial position in any boundary issue.

PRINCIPLE 3. *An expert surveyor's opinion is predicated on the evidence that is available at the time the opinion is formulated. Change the evidence, and the opinion may also change.*

A surveyor's opinion is based on the evidence that was originally created, then described and subsequently recovered and evaluated. Since evidence is a major factor in helping the surveyor to formulate the opinion, if and when new evidence is found, or the integrity of existing evidence becomes violated, then the expert's opinion may also be affected. Surveyors should be very careful in making premature opinions based on partial, incomplete, or faulty evidence before sufficient evidence is recovered and then evaluated.

A surveyor should never become 'boxed in" to any opinion. Before an opinion is rendered, sufficient evidence should be recovered and evaluated. Once the opinion is formulated, if additional evidence is recovered and presented, then the surveyor may render a new opinion based on the new evidence.

Before any field survey begins, the professional land surveyor (PLS) must conduct an exhaustive review of the publicly recorded documents that describe or convey the property in question. Then, the surveyor must search for physical evidence such as natural and artificial monuments during the field survey. The evidence collected in the county records combines with the field evidence to form an opinion of each property's boundary corner. If the surveyor meets the standards of care for the research and field survey, and new evidence is found by subsequent surveyors, then the PLS may alter his or her boundary opinions to reflect the newly-found evidence without censure.

PRINCIPLE 4. *The surveyor should never use the adjectives "ALL" or "COMPLETE" or "FINAL" in describing evidence or the surveyor's expert conclusions based on the evidence. Expert opinions are based on the available evidence. There may be other evidence that was not found by the surveyor or was withheld from the surveyor.*

When dealing with historic evidence, including documents and field information, or a multitude or complexity of evidence, there can be no absolute certainty that research and field recovery have uncovered all of the evidence. To write the word *all* or state at trial that "I considered all of the evidence" could make for an embarrassing situation when a document is found that was never examined or was overlooked while doing research, or when the opposing expert surveyor produces evidence that conflicts with your evidence.

Some clients, especially title companies, demand that survey plats contain certification statements that are absurd. Examples include statements such as "no

encroachments exist" or "this property contains 100.0000 acres of land." These statements, which are impossible to prove, place added liability onto the surveyor and create a false sense of security for the landowners. Instead, the surveyor should only certify to what the evidence shows. An example of a valid statement would be "no *visible* encroachments exist at the time of the field survey" or "this property contains 100.00 acres of land, *more or less*."

PRINCIPLE 5. *Every survey of a conveyance must start from evidence that proves the position of at least two consecutive monuments somehow related to the written record.*

An indispensable part of every survey that either creates the parcel or lines of the parcel and the subsequent retracement of an existing conveyance is the discovery and the evaluation of the original evidence.

Evidence is *not* proof! Evidence is the commencement of the recovery process from which one must make conclusions, and from these conclusions flows the proof. Proof is the establishment of the sufficient requisite evidence to instill in the mind of the trier of fact or the surveyor as to the facts at issue. It is the *totality of all of the evidence* that persuades the trier of fact (the surveyor or the jury) as to the truth of the location of the parcel being retraced.

The surveyor's use of evidence is the means or methodology that is used by the expert surveyor to convince the trier of fact or the jury that certain events took place that created the boundaries of the parcels being retraced.

Consider the question, "Is this an original corner?" Does the recovered evidence, as it relates to the documented evidence that describes that particular corner or parcel correlate to the found evidence on the ground? If so, then the evidence creates the following in the mind of the surveyor: "I have found the original point of the corner." The found evidence proves the original corner location.

In the process of performing a complete survey of any parcel of land, whether it is considered an original survey or a retracement, certain steps should be followed, usually in this order:

1. A request, preferably in writing, for the survey is obtained, usually from the client or preferably from the title company.
2. Title evidence is researched and obtained, either by an attorney or a surveyor. Usually this is written evidence of title in the form of deeds, abstracts, title policy, or plat.
3. The surveyor should rely on documents and information delivered by the client only in rare instances.
4. Evidence of maps, field notes, county and city records of surveys, state and other public agency records of surveys, and necessary written records that disclose evidence of monument positions, both pro and con, pertaining to the survey is obtained.
5. Adjoiner deeds for evidence of seniority or conflicts are examined or read.

6. Armed with evidence of existing monuments called for in the writings and witnessing evidence of possession and usage, the parcel is inspected.
7. Testimony (evidence) of the existence and location of old monuments and the history of possession is sought and evaluated.
8. Measurements are made from found monuments to determine search areas or locations to dig for missing monuments, and measurements (also evidence) to tie found monuments together are made.
9. Calculations (also a form of evidence) are made to confirm found monuments or to determine the validity of areas or the marking of lost corners.
10. From the evidence of monuments, measurements, testimony, and computations, conclusions in accordance with the laws of evidence are made.
11. Based on these conclusions, measurements are made to set new monuments in accordance with these conclusions.
12. Finally, a report should be prepared for the client (see Figure 2.1 and Appendix A) [10]. The report becomes new evidence.

Principle 5 must be understood by any practicing surveyor, in that a line is usually as terminating at a corner at each end, and may be described by a call for two corners, one at each end of the line, as well as by a bearing and a distance, and according to the dignity of calls, it can only be absolutely and legally fixed by the identification of both monuments. If only one monument is relied on, then the course (bearing and distance) has errors in position because both the bearing and the distance are subject to the normal errors one might expect in creating the line and then in retracing the same line.

If the evidence is changed, then the final conclusions may change.

Until a surveyor obtains sufficient knowledge of the available evidence, it is nearly impossible to make a correct boundary determination or location. Change the evidence, and the location of the line(s) may change, and the resulting opinion and the law may also change. The important aspects of any boundary survey are the ability to search, find, and discover all available evidence and to arrive at conclusions about where boundaries belong in accordance with the laws of evidence and the laws of boundaries. A surveyor may be able to compute, make drawings, use instruments, and stake precise engineering projects, but he or she is not qualified to make boundary locations without understanding the laws of property and boundaries and the laws of evidence.

2.5 Arrangement of Subject Matter

Because of its nature, the subject of evidence is comprehensively treated in the legal literature but is seldom found in technical surveying textbooks. Thus, we must first define terms and elementary rules of evidence that the student must know and understand.

Evidence in itself is not proof of facts; conclusions or inferences that can be drawn from evidence are proof. In defining what inferences or conclusions can be drawn from evidence, the law has evolved rules to aid in evaluating evidence. The law uses such terms as *presumption*, *rebuttable presumption*, *inference*, *burden of proof*, *extrinsic evidence*, *preponderance of evidence*, *clear and convincing evidence*, and evidence that is *beyond a reasonable doubt*. The surveyor should understand these terms as they are legally defined in order to be able to clearly understand the laws and rules of evidence as evidence affects original surveys and the resulting retracements thereof.

Evidence varies in significance, importance, weight, and application. Witnesses may give eyewitness testimony as to the location of a boundary (property) corner. But such evidence is incompetent and irrelevant to overcome the location of an original, undisturbed monument called for and proven by original evidence or even circumstantial evidence at a location other than that testified to. The evidence of a rock mound is of little importance where the original notes called for an oak tree. The evidence of a measurement is incompetent to prove an original monument to be in error. The retracing surveyor should not entirely discredit or eliminate measurements as they may be quite useful in supporting evidence of a lesser degree.

In reaching conclusions from evidence, the most important attribute a surveyor needs is the ability to recognize and know what is the best evidence of that available. Yet the term *best evidence* has an entirely different concept to an attorney or lawyer. After defining terms and after presenting legal concepts that determine the effect of evidence, the remainder of this chapter is arranged, in descending order of importance of evidence, that is, in the order of the best available evidence.

Many misconceptions as to the proper methods to locate boundary lines arise from the misconceptions of the rules of evidence concerning what is the best available evidence. Most surveyors understand that a monument called for in documents in either the survey chain of history or the chain of title of the parcel and then found and if undisturbed is given preference over calls for measurements; but it must be distinctly understood that, to have primary or controlling significance, the monument must be called for by the written evidence, either directly or by implication. There may be instances that an uncalled-for monument may control, but the control of this monument may be for other reasons.

Few surveyors realize that failure to know the law of evidence may result in disciplinary actions, claims of malpractice, and other claims of negligence.

The subject matter is arranged into four objectives:

1. Understanding the importance of presumptions when it comes to evidence.
2. Defining what is acceptable evidence.
3. Stressing the order of importance of evidence—that is, what is the best available evidence.
4. Stating the boundary surveyor's obligations with respect to evidence.

2.6 Kinds of Evidence

In Section 2.1, evidence was defined and identified by various legal scholars. Courts and legal scholars recognize at least five kinds of evidence which the surveyor should become familiar with:

1. Written evidence is evidence in the form of documents.
2. Real evidence consists of material objects addressed directly to the senses, including physical monuments.
3. Oral evidence or testimony is evidence given by witnesses.
4. Judicial notice is evidence in the form of knowledge. The courts may take judicial notice of certain facts such as (a) the true significance and meaning of all English words and phrases, (b) whatever is established by law, (c) the laws of nature, and (d) other well-known and commonly accepted facts.
5. Circumstantial evidence may be the most important of all of the forms or types of evidence when it relates to ancient boundaries.

2.7 Evidence, Conclusions, and Proof

PRINCIPLE 6. *Evidence is not proof. Evidence leads to proof. A consideration of sufficient evidence and conclusions to be drawn from evidence, in accordance with the law of evidence, may produce proof.*

Evidence is not proof of a fact; a conclusion or inference that may be drawn from evidence is the proof. A written deed is evidence of ownership; it is not proof of ownership. Land can be gained by unwritten means; hence, a paper title does not prove ownership. It is evidence only of the claim of ownership and the right of possession. A written deed may be void because of state statutes defining limitations or prior court decisions. If a person can prove by evidence that he or she has a written deed vesting title, that the person conveying the land was competent to do so, that no one adversely occupies the land described by the deed, that title has not passed by escheat, and that other items making up ownership do not operate against that person, he or she may have proof of ownership.

Proof may be considered the establishment of that necessary degree of belief in the *mind* of the trier of fact as to the facts at issue. It is the culmination or the *totality* of the evidence that persuades the trier of fact. With the question of proof comes the *burden of proof* that must be carried forth. In most litigation, that burden is placed on the plaintiff to prove his or her case. In this, the person on whom the burden is placed must rely on all forms of evidence, usually circumstantial and testimonial, to persuade the trier of fact that certain events occurred. The burden of proof is separated into two parts:

1. The obligation to produce.
2. Going forward with the evidence to prove the facts.

Raw recovered evidence is neutral; that is, until the surveyor draws conclusions from the evidence that is recovered, the evidence is neutral in weight and application. Each surveyor applies the evidence in light of his or her training, education, and experience, and usually no two surveyors see evidence in the same light.

Surveyors will use a legal description of property and mark it on the ground; they do not and should not, unless specifically requested by legal counsel, consider validity of signatures, possible insanity, whether by escheat, competency of the seller, or like considerations. They do consider senior rights and note possession not in agreement with the written deed.

It is in this area of evidence that clients, attorneys, and perhaps some judges cannot understand how (and why) two surveyors who use and analyze the same evidence can draw different conclusions, yet once in a while there are rays of hope, one of which was addressed in a federal court:

> It is a well-known fact that surveyors are apt to differ from each other, and surveyors employed by the United States government are not immune from the frailties of their profession . . . [11].

A second court wrote:

> It is a matter of common knowledge that surveys made by different surveyors seldom, if ever, completely agree. And that, more than likely, the greater number of surveys, the greater number of differences [12].

In a recent article in the *American Bar Association Journal*, Williams and Onsrud wrote:

> Surveyors occasionally disagree on the proper location of a boundary line—not necessarily because each surveyor measures better than the other, but more commonly because each surveyor has weighed the evidence differently and has formed different opinions. Just as two lawyers may draw different conclusions from the same line of cases, surveyors may disagree about the appropriate location for a boundary [13].

2.8 Classifications of Evidence

Evidence varies in weight and dignity. In general, evidence may be divided into 10 classifications:

1. **Indispensable evidence** is evidence that is necessary to prove a fact. Conveyance of property must be in writing; hence, a conveyance cannot be proved without proof that there was a written document.
2. **Conclusive evidence** is that which the law does not permit to be contradicted. As an example, the contents of conveyance writings (recital of a consideration excluded) are conclusive as between the parties, except for pleadings if illegality, fraud, mistake, or reformation. Also, the written document, or contract, cannot be altered by oral testimony, and, as is commonly and frequently stated, everyone is presumed to know the law.

3. **Prima facie** is that which suffices for proof of a fact until rebutted by other evidence. In the event that an original deed cannot be produced, a recorded deed is prima facie evidence of the contents of the original. In many areas, the results of the survey of certain official surveyors, such as the county surveyor, are prima facie evidence of the location of lines. Prima facie evidence may be disproved, but until it has been proved incorrect, it is assumed to be correct. The law specifies what is or is not prima facie evidence.
4. **Primary evidence** is that which is most certain. The contents of a written document are more certain than the oral testimony of what the document contained.
5. **Secondary evidence** is inferior to primary evidence. A copy of the original document is inferior to the original. Secondary evidence is used to prove the contents of lost or unavailable primary evidence.
6. **Direct evidence** proves a fact directly without resorting to presumptions or inference; for example, a witness testifies, "I saw the surveyor drive the stake into the ground."
7. **Circumstantial** or **indirect evidence** depends on inferences or presumptions that tend to prove a fact by proving another; for example, the witness testifies, "I saw the surveyor drive similar stakes at other corners."
8. **Partial evidence** establishes some detached fact. At times it is erroneously referred to as corroborative evidence.
9. **Extrinsic evidence** is derived from sources outside the writings.
10. **Corroborative evidence** is supplementary to evidence already given and tending to strengthen or confirm evidence already given. It is additional evidence of a different character. Corroborative evidence, if used, may also act in a negative aspect.

2.9 Types of Evidence Gathered and Considered by Surveyors

Evidence used by surveyors to prove boundary lines or deed line locations can be placed in the following categories. Before any evidence can be used or considered, it first must be tied to written document or documents in the chain of title. These can be any of the following six categories:

1. Written documents, maps, and historical facts directly traceable to the specific parcel.
2. Facts, laws, and documents of which the courts may take judicial notice.
3. Physical objects (real evidence) observed by the surveyor, for example, surveyors' stakes, trees, fences, rivers, and street improvements.
4. Parol evidence, which may be divided into:
   a. Witnesses who observed the former location of physical objects (a monument now destroyed).
   b. Witnesses who can explain a latent ambiguity.

c. Witnesses who can testify about commonly reported facts.
d. Witnesses who can describe the customs or conditions existing as of the date of the deed.

5. Measurements of distances, bearings, and angles that were conducted.
6. Mathematical calculations, including correlations and algorithms.

2.10 Scope

To understand the law of evidence, one must first answer the basic question, "What is evidence?" This first must include a definition of evidence, the effect of evidence, and the competency of evidence. A summary of terms used by the courts to determine the effect of evidence and a summary of those rules that determine the amount of evidence necessary to produce proof provide an introduction to the section on best available evidence.

2.11 The Law of Evidence

DEFINITION. *The law of evidence is a collection of general rules established either by statute law or by case law to accomplish the following*:

1. *Declare what is to be taken as true without proof.*
2. *Declare the presumptions of law, and identify those that may be rebuttable and those that may be irrebuttable as well as that may be defined as both those that are disputable and those that are conclusive*.
3. *Produce legal evidence*.
4. *Exclude whatever is not legal*.
5. *Determine in certain cases the value and effect of evidence*.

The surveyor is involved in evidence in two instances: first, as the individual who creates the original evidence of the original boundary or boundaries and, second, as the individual who is given the task or responsibility of recovering the evidence of the first surveyor. The success of the second surveyor is directly affected by the quality of the evidence returned by the first.

The two surveyors, the creating surveyor and the retracing surveyor, are seldom the same individual. In many instances, decades or centuries may separate the work of these two individuals.

The quality of each surveyor's tasks is directly dependent on his or her capabilities, training, and quality of work performed. On the one hand, if the creating surveyor was lax in creating the boundaries, that is, failed to do what he or she purported to do or failed to adequately describe what was done, then the task of the retracing surveyor is made more difficult because of the difficulty of recovering and identifying the evidence that was initially created and left for history.

On the other hand, if the retracing surveyor is unable to adequately recover the evidence because of lack of training or failure to recognize the original evidence, then the process is seriously flawed, and questionable results will be obtained. In this instance, the creating surveyor's evidence lacks effectiveness if the second surveyor cannot recover it.

The surveyor uses evidence to assist in locating and proving boundaries that identify property locations, and, unless correctly recovered, identified, and finally evaluated, evidence is worthless. The law of evidence—that is, the law that declares what evidence is admissible and what right is to be accorded to admissible evidence—is determined by codes, statutes, and common law. It is the law of evidence that the surveyor relies on to guide him or her in assigning proper values and weight to discovered and known evidence. Not all jurisdictions have the same rules of evidence; hence, variations of the law of evidence can be expected in different states as well as at the federal level.

It has been decided by the courts that the only true and correct location of a written deed is the position that a court of competent jurisdiction decrees to be the correct location. The court bases its decision on admissible evidence and the application of law to the evidence presented first by the plaintiff and in rebuttal by the defendant. Understanding the significance and value of a particular piece of evidence is just as important as understanding the statutory and common laws that pertain to boundary location. The courts sometimes disagree on the value and conclusiveness of evidence. A higher court has been known to reverse the lower court, and, on occasion, two judges with identical circumstances have rendered opposite opinions. In the U.S. Supreme Court, there have been numerous five-to-four decisions. If experts in interpreting the value of evidence are not in complete harmony, it can be expected that on occasion surveyors will not agree. Disagreement in itself is sometimes a desirable thing. Disagreement with existing theories of science has, without doubt, been the cause of new discoveries. Disagreements may bring advancements; but disagreement based on stupidity, lack of knowledge, or being unusually stubborn is undesirable and can be professionally devastating for the surveyors and financially devastating for the clients.

A Florida court addressed the question as who is the most qualified person to take a written description and place the words on the ground, and it adjudicated that a registered surveyor was the *only* qualified person to locate a written description on the ground [14]. (Note: At this time, the student should read this case in Chapter 19, Section 19.7.)

The decision of the Florida court has great insight as to the relationship of the original surveyor, who creates boundaries, and the retracing surveyor, who assumes the responsibility of retracing the originally created boundaries. The appellate court commenced its decision as follows: "Since time immemorial, parcels of land have been identified and described by reference to a series of lines or 'calls' or 'courses' that connect to completely encircle the perimeter or boundaries of a particular parcel" [15].

The court then went on to discuss the place of the original surveyor as well as the retracing surveyor. To the student, it will become obvious that evidence becomes a critical element in the survey of land and land descriptions.

Although it is admitted that sometimes the value of given evidence is debatable, usually evidence is not subject to alternate interpretations. Since the practicing surveyor can expect on occasion that his or her findings of boundary location will be tested in court, he or she should assign values to evidence in the same proportion that it will be accepted in court. For example, it is indeed a difficult task to get an unrecorded map accepted for court evidence unless it is accompanied by the surveyor's testimony or is declared ancient by law and is commonly reputed as being correct, in which case evidence may be admissible as exceptions to the "*hearsay rule*." Surveys based on unrecorded maps of unknown origin may be impossible to substantiate in court.

The value of evidence is relative and is subject to general, not definite, rules. In a borderline decision, what the law of evidence is will not be known until the conclusion of the case. The court then declares what the law is and further takes the attitude that this is the law as it always was, and this is the law as you should have known it to exist all the time. Fortunately, the majority of boundary surveys are not dependent on doubtful legal considerations.

The burden of proving a boundary is placed on the person claiming the boundary and not on the neighbor.

2.12 Burden of Proof

The term *burden of proof* does not have a fixed and definite meaning and application. On the contrary, at times it is used indiscriminately to signify one or both of two distinct ideas or philosophies. There has been a concentrated effort to bring a clear and uniform understanding of its meaning.

In recent decisions, courts have held that the burden of proof signifies the duty or obligation of establishing a conviction in the minds of the jury or the judge of the ultimate issue or questions being tried. The interpretation of what the term *burden of proof* means has one meaning at law, but may have multiple meanings when applied by the various judges. To the surveyor, it should have only one meaning. In legal circles, the term is defined as follows [16]:

> BURDEN OF PROOF. Lat. *Onus probandi*.
>
> In the law of evidence. The necessity or duty of affirmatively proving a fact or facts in dispute on an issue raised between the parties in a cause.

In describing the term, an Illinois court wrote,

> [I]t is frequently said, however, to have two distinct meanings: (1) the duty of producing evidence as the case progresses; (2) the duty to establish the truth of the claim of the preponderance of the evidence and through the former may pass from party to party, the latter rests upon the party asserting the affirmative of the issue [17].

The term also signifies the duty that the party using the evidence has the burden of "going forward" with the evidence. This duty of going forward, in itself, is not evidence, but a rule of law, that the party who is carrying the burden, the plaintiff, must prove his or her case, and the defendant has no burden to prove anything. The party who has the burden is obligated to prove his or her case, and a failure to do so may be fatal as to the final adjudication.

The law points out two burdens:

1. The burden to produce enough evidence so that a reasonable conclusion can be reached.
2. The burden of persuasion or producing evidence so that the preponderance of the evidence will be in favor of the individual who raises the question.

PRINCIPLE 7. *The affirmative party or plaintiff in a civil case has the duty of presenting sufficient evidence to convince either the judge or jury of the allegations. He or she has the burden of proof. A defendant has no obligation to present evidence.*

The burden of proof, or the need to prove the case, lies with the party who wishes to prove the fact. The individual wishing to prove his or her title has that burden and cannot rely on the weakness of the other person's title. The surveyor seeking to prove a survey is correct cannot rely on the fact that the other party had no survey; however, this burden can shift under certain circumstances. The individual who seeks an affirmative defense or who seeks a counterclaim has the burden shifted.

Although more of a legal problem than a survey problem, the burden of proof has at least three separate legal concepts:

1. The plaintiff is obligated to produce the degree of evidence required to prove the facts that are being relied on.
2. The party is obligated to *introduce* or *go forward* with the evidence.
3. The burden of proof may shift during the course of a trial.

Thus, under concept 1, the moving party must persuade the jury that the facts being presented prove the facts they want to use in order to win the case. This is accomplished through the testimony of the expert surveyor witness.

Making a prima facie case means that the affirmative party must supply sufficient evidence to win the case. Since evidence is for consideration by a jury, it is the total accumulation of the evidence that establishes the degree of certainty in the mind of the surveyor to persuade that certain facts are true.

Simply put, if the moving party does not have sufficient evidence to prove the case, the defendant may move for a directed verdict; but if the defendant cannot produce sufficient evidence to counteract the plaintiff's evidence, the plaintiff may move for a directed verdict. This is a trial tactic that is usually conducted as a pretrial motion, before the start of the trial. Most attorneys use this pretrial motion routinely in the conduct of boundary issues.

At the close of the plaintiff's case in chief and at the request of the defendant, if the plaintiff fails to present sufficient evidence to prove his or her contentions, the court will leave the parties in the position in which it found them and hold for the defendant. In effect, the defendant wins, and the status quo is maintained.

This could result if it is determined that the measurements are incorrect or if the surveyor started from the wrong beginning point; thus, the survey and all testimony fail, and the respondent's case falls with it.

As an example, a boundary in dispute was located on the range lines created in a federal General Land Office (GLO) survey line. The land owned by the state was settled on and homesteaded by John F. Gates in about 1907. He constructed a fence on the east of his land, which was now claimed by the state as the true line.

The true boundaries of the lands could not be determined from the evidence. Gates employed no surveyor to locate his lines, and he testified, in substance, that the fence was built as a fence of convenience, not intended to represent the line to which he made absolute claim, and that he would have changed the fence to the true line if and when it should have become known. The point in dispute is whether the Robert survey and the U.S. government survey approved in 1927 or the Harvey survey is correct.

Harvey, who surveyed the same township, did not run a straight line through the township, only from the southeast corner of the township for a distance of 5 miles, then angled west, and then north, to connect with the northeast corner of the township. The witness stated this was an incorrect method. From the testimony it was clear to the court that the state failed to sustain the burden of showing that the true line between its land and the land of the defendant is that claimed by the state [18].

This situation happens many times when one party fails to properly conduct a retracement survey in accordance with the proper rules of survey. This usually occurs either by shortcutting the survey process or because of money or time restraints. When there is no question of title but only a question of boundary, in relying on a survey, the moving party should first show that its survey was properly conducted in accordance with proper rules or principles of retracements.

In one instance, the plaintiff sued in equity alleging ownership and possession of a small tract of land that was described as follows: "Bounded on the south by the lands of Wilk Witten; on the west by the lands of James LeMaster; on the north by the lands of G. Preston; on the east by the lands of W. W. Brown, and containing 15 acres, more or less." The defendants claimed this to be at the head of a hollow while appellants claimed it to be further down the same hollow. The true determination rested largely on the ascertainment of the boundary lines of an old patent. The court held that the disputed calls were "N 13° E, 10 poles to two maples and a small oak in a dogwood gap; N 23° E, 68 poles to a beech and maple; N 18° W, 80 poles to a beech on the bank of a branch." The court said these were the seventh, eighth, and ninth calls of the patent. A certified copy of the plat of the patent is the same except the call for 10 poles, in that the 10 poles are 100 poles. In addition, a number of witnesses testified as to the location of the dogwood gap. The court stated: "We are unable to determine which is correct, as the abutting lands are not described with any degree of certainty. The burden is on the plaintiff and the doubt should be resolved against him" [19].

Since no party was able to say with certainty the location of the lines in question, the court left them as they were. Ordinarily, the burden of proof is on the plaintiff, but a defendant has the burden of proof in matters of defense. Where the statute divides the burden of proof equally (as in Louisiana) [20], each side has an equal responsibility. The burden of proving surveys, monuments, agreements, acquiescence, or a change of a boundary is on the party asserting that fact.

In another situation, the court had to examine the "survey" of a registered surveyor and draw its own conclusions. Hageman, a civil engineer, presented a plat and stated that he examined the area in question and found the course of the stream was not as shown on the government plat but was as described on a plat that he produced that showed the stream flowing east of south instead of southwesterly into the Quillayute River and that, as a result, lot 3, if extended to the actual stream, would contain a little more than 82 acres of land instead of 39.50 acres. It was shown that Hageman made no actual survey using instruments and that the area indicated the stream was merely a visual survey without any actual measurements to delineate the area, without determining the exact course, sinuosities, and location of the actual stream. He had never even made any boundary surveys, although he was probably professionally competent to do so. The court held that what he did in this matter was merely that of a nonexpert, and it could not consider this evidence competent to prove the fact that it was offered to prove or sufficient to contradict or impeach the official government survey that fixed the character of the entry and determined whether the possession is adverse [21].

In a situation where there has been possession doubt in the location of a parcel (especially for long duration), location evidence is usually resolved to leave the status quo; proof of true lines must be positive.

As an example, three separate surveys were made by three surveyors, and each surveyor admitted he was unable to state whether or not the point from which he started his resurvey corresponded with the corner of the block as it was originally surveyed. The appeals court stated: "We think that the appellant has failed in this court to establish where the true boundary line lies. In case of disputed boundary lines, based on uncertain evidence the courts ought not to disturb boundary lines between lot owners which have been acquiesced in for years" [22].

2.13 Degree (Quantum) of Proof of Evidence

Courts consider the degrees of evidence—that is, they give legal ranking to it—yet seldom does a surveyor rank evidence as to its weight, that is, its dignity. To the surveyor, evidence is evidence. If it helps to prove a point, use it; if it cannot, do not use it. By contrast, courts and lawyers wish to give evidence a ranking as to the degree of proof needed to prove a fact or facts.

Any surveyor must do the amount of work, including research and surveying, needed to make certain that the burden required can be sustained. Anything less may lead to problems when it comes to "proving" that certain facts are true based on the evidence collected.

For routine boundary dispute cases, which are almost always civil, not criminal, the degree of proof required for the plaintiff to win their case is the preponderance of the evidence. In some rare causes, such as adverse possession or prescriptive easements, the degree of proof rises to clear and convincing.

Land tenure cases, including boundaries, easements, title, and water rights, are almost exclusively based on state law. Since these are not matters of federal statutes or federal case law, the plaintiffs must bring their cases to the court in which the property lies. For example, if the properties in dispute are in Sparta, North Carolina, then the proper venue is the District Court of Alleghany County, North Carolina.

If the cases are brought in state court, then the degree of proof required will be set by state statute or state case law. The Federal Rules will not apply. Therefore, it is important that the plaintiffs, attorneys, and land surveying expert witnesses appreciate the degree of proof required for each cause of action before bringing suit against the defendants.

In litigation that involves gaining or losing of interests in land and the modification of boundaries, which include adverse possession, acquiescence, and boundary agreements, the weight is then increased to the middle degree—that is, "clear and convincing" or "clear and positive." A definite and unambiguous definition of this category is not available, but it has been held to be "more than a preponderance but less than beyond a reasonable doubt."

2.14 Preponderance of Evidence

PRINCIPLE 8. *In civil cases that deal with boundary issues, it is not necessary to prove "beyond a reasonable doubt" as in criminal cases; it is only necessary to prove a "preponderance of evidence."*

Preponderance of evidence is the least demanding of the three categories or, according to some courts, "more creditable and convincing." Preponderance of the evidence is not considered by the number of the witnesses, but by the ability of one or more witnesses to "convince" the jury or the judge, and perhaps the opposing party; it is the greater weight of the evidence, not the "total weight" or totality of the witnesses. The surveyor cannot always prove conclusively "beyond a shadow of doubt" that found monuments are positively in their correct position or if they even are the original monuments. If they are to be upheld by the courts, the surveyor must be prepared to prove that the preponderance of evidence is in his or her favor. A second surveyor, in disagreement with the first, must be prepared to prove by a preponderance of evidence that the other is wrong. This *preponderance* criterion is the threshold from which all evidence is related. From this evidence base, the decision is the evidence to prove the facts, then it is sufficient. The more conclusive the evidence, the more certain are the facts.

Often, when the evidence is inconclusive, the jury leans toward the individual who can best communicate the story to them. The ability of the surveyor to "persuade" then becomes important.

Preponderance of evidence is not necessarily just more than 50 percent of the weight of the evidence, or even related or identified by a number, it should be one of convincing what is said to be solid evidence. It is not predicated on the number of witnesses, but what the witnesses have to say and what facts they will testify to. It has been variously defined as that which inclines "an impartial mind as to one side rather than the other" and that which removes "the cause from the realm of speculation." In a survey, the surveyor should be satisfied with the preponderance of evidence, giving due weight to presumptions, prima facie the evidence, and law, that the location is probably correct to the exclusion of other possible methods of monumenting the property.

The surveyor investigates all possibilities, excludes the unlikely or improbable, and monuments in accordance with the most certain.

The law does not require such a degree of proof as, excluding the possibility of error, produces absolute certainty because such proof is rarely possible. Moral certainty only is required or a degree of proof that produces conviction in an unprejudiced mind.

In a Louisiana case, the question to be determined was whether an oil well had been drilled on one side or the other of a line that divided two quarter sections of land in a section and township that had been surveyed and subdivided by the authority of the U.S. government. One might think that it was a simple question, but it was not. The court said:

> No one on earth can furnish the information necessary for its decision, save the gentlemen of the civil engineering and surveying profession, and those of them who have testified in that behalf in this case have *arrayed themselves on opposing sides*. Several surveys were made in order to re-establish the lines and corners originally established by Jones and Moore. Mr. W. E. Martin made his survey in which he located the line 22.2 feet east of the oil well. Mr. H. E. Barnes, on behalf of the defendants, found the line to be 15.7 feet west of the well. A private survey made by Mr. H. A. Jenkins, on behalf of the defendants, located the line 35 feet west of the well. Mr. A. D. Kidder, acting on behalf of the United States government, made a survey for purposes not connected with this litigation, located the line 1.74 feet east of the well. Mr. Welman Brandford, who was employed by the defendants, found the line to be 31.2 feet west of the well. Surveyors Martin and Williams, surveying under direction and instructions of the trial court, reported the line run under these instructions to be 14.7 feet west of the well [emphasis added] [23].

Many other surveyors testified in the case, and the diversity of opinions among them was most bewildering to the judges as well as to the lay minds of the jury and the witnesses. The gentlemen who were employed or consulted in the matter were all reputable members of the civil engineering and surveying professions; their work seems to have been done with care, and their opinions expressed only after deliberate consideration. It therefore seemed to be impossible to determine and to prove with mathematical and absolute certainty precisely where the corners designated on the sketch belong. This situation may likely have been the result of

error in the original field notes, as in the resurvey made in connection with this litigation. The court said:

> We shall proceed to establish the limits of the property according to what we consider to be the preponderance of evidence in the case. Of the several surveys made, one stands out most as worthy of consideration by the court. It was not made on behalf of any of the parties in the interest of this litigation, but it was ordered by the United States Government, and it was executed under instructions from the General Land Office, whose stamp of approval has been placed upon it. The engineer under whose personal supervision was done was Mr. Arthur D. Kidder, supervisor of chief of surveys of the General Land Office [24].

It was found that in the field, an accurate north and south line was established to determine with absolute accuracy the variation of the needle. Neither he nor his assistants, though aware of a contest involving the ownership of an oil well, knew, at the time of making the survey, any of the litigants in the case, nor did they know on which side of the line in dispute the said litigants respectively claimed the oil well to be located. Under these circumstances, the recognized ability and competency of Mr. Kidder, the total absence of any possible bias on his part, the great care he exercised in the performance of his work, the most modern and scientific methods adopted by him, and the further fact that the results of his work bear the approval of the General Land Office were, in the court's opinion, sufficient to establish a preponderance of evidence in favor of the plaintiff to justify a decree based upon his findings under the law [25].

Preponderance of the evidence may not mean by weight; rather it usually refers to quality of the evidence, not quantity. Preponderance is the usual proof required in civil cases, in which questions of surveys and boundaries are litigated. As required by the court, this is simply the ability of one witness to induce a persuasion in the mind of the judge or the jury. The evidence may not be conclusive for either party. Preponderance means the weight, credit, and value of the totality of the evidence presented by either or both sides [26]. One could look at preponderance as being "most probable" or most convincing. Preponderance is not predicated on the number of witnesses who testify, but on the credibility of the witnesses.

2.15 Clear and Convincing

PRINCIPLE 9. *A person claiming adverse possession, acquiescence, or loss of property rights usually must present clear and convincing evidence.*

Modern courts require proof of property rights by unwritten means to be "clear and convincing," "clear and positive," "clear and satisfactory," or in some other way "clear."

One court attempted to give a definition, but in doing so only added confusion. It stated that "clear and convincing" was somewhere between preponderance and beyond a reasonable doubt [27].

To the boundary surveyor, this places an added burden or requirement for a solid survey, and the search for and recovery of more evidence of a positive nature than what

ordinarily would be required to prove a simple survey. To the surveyor who testifies as to disputes in this area, a critical burden is added in that the surveyor whose testimony is being heard must have an ability to communicate the facts to the court and to the jury.

2.16 Beyond a Reasonable Doubt

Beyond a reasonable doubt is the proof usually required to prove guilt in criminal cases. Yet, this degree of evidence is also the degree of proof that is required by the Bureau of Land Management in differentiating between a lost and obliterated corner. *Reasonable doubt* is a term well understood by the courts but very difficult to define by the surveyor [28]. The difficulty is that each surveyor will apply a different standard to the terminology. What is reasonable to one surveyor may not be reasonable to another.

PRINCIPLE 10. *A survey may be proved by any evidence of facts that are relevant and material, but this evidence may not be admissible.*

The methods of proof can include many different forms of evidence. Judicial notice, judicial admissions, presumptions, and evidence, both direct and circumstantial, all may be considered methods (evidence) for proving facts.

2.17 Relevancy and Materiality

To be of value to the surveyor, all evidence must be relevant and material; but to be of value to the lawyer or to the judge, it must be relevant, material, *and admissible* in the court of law.

Many people consider relevant and material as being the same, but they are not. In trying to differentiate between the two words, relevancy refers to whether the evidence being offered has to deal with the fact(s) in issue. *The Federal Rules of Evidence* Rule 401 defines *relevant evidence* as "evidence having the tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence" [29].

Regardless of the definition used, the person seeking to determine if evidence is relevant must ask, "What issue is the evidence relevant to?" What is the attorney or surveyor trying to prove?

Then, considering *materiality*, the individual, when confronted with the second question, must ask, "Is the evidence offered upon a fact properly in issue?" If the surveyor or attorney is trying to prove an issue or a fact, then only those elements that tend to prove the issue are material (Figure 2.2).

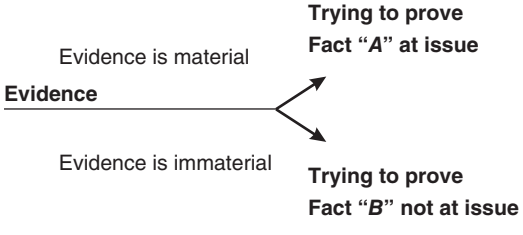

FIGURE 2-2. Material facts.

2.18 Admissibility, Relevancy, and Conclusiveness of Evidence

The purpose of any trial is to determine the truth regarding the issues that are presented by both sides and then make a decision based on the facts. In court, not all evidence is admissible to prove boundary location. Evidence, to be admissible, must be relevant to the issues, competent under established rules of law, and material in the sense of having some reasonable tendency to prove or dispute points in issue and then presented to the trier of fact for its consideration. The decision about what evidence will be admitted lies exclusively with the judge. Parol evidence, with some exceptions, must be based on direct observations and normally cannot be something the witness had heard someone else say. This is addressed in the rules of evidence in the area of hearsay. Lay witnesses generally do not express conclusions from evidence. Thus, there are rules about what evidence should be considered. The admissibility, relevancy, or conclusiveness of evidence is discussed in evaluating the various types of evidence used to ascertain boundaries.

DEFINITION. *Relevancy is a relationship between the evidence being used and the fact, theory, or proposition that the surveyor wishes to prove.*

The Federal Rules of Evidence Rule 401 defines relevancy as any "evidence having any tendency to make the existence of any fact that is in consequence to the determination of the action more probable or less probable than it would be without the evidence" [30]. This definition probably may be stated very simply as in "Does it tend to prove the fact with a great degree of probability?," that is, to a degree better than 75 percent. The surveyor must then ask if the evidence is relevant, and material and what is its probative value to the issues he or she wishes to prove.

Materiality addresses the question of whether the evidence that is offered relates to the question (issue) that is to be proved. If section corners of section 10 are in question, all section corners in that section are relevant, but the corners of the other sections are not material if all of the section corners of section 10 are recovered and proven. Since the law of surveying states that found original corners control and a surveyor cannot go beyond a found original corner, the other section corners only become material if one or more of the section corners of section 10 are considered as lost and the surveyor is required to proportion from the closest original corner. Once the attorneys determine or agree to the issues, the surveyor determines what must be proven; then the question of materiality is addressed.

This may also apply to a township corner, in that no corner or corners outside the township or subdivision being retraced is material to reset any corners within the township or subdivision but they may be used as corroborative evidence to support supporting evidence within the township or subdivision.

Probative evidence is evidence that logically must tend to prove the theory or fact for which it is being offered. Such evidence must be considered as one where the surveyor applies logic and common sense. To be relevant, evidence does not have to be actually determinate of the fact for which it is being offered, but it must tend to prove the fact or be probative [31].

At trial, collateral facts, even if not relevant, material, or probative, usually are admitted. The student must remember the admittance of any and all evidence is in the sole discretion of the trial judge. Such purposes as impeachment of a witness, rebuttal to material evidence introduced by the opposing side, and more important evidence may be used to establish a foundation for relevant evidence later in the trial.

Today lawyers, courts, and surveyors tend to consider both materiality and probative evidence as the same. When dealing with evidence, surveyors should not play lawyer. The surveyor should use or consider evidence for its ability to correlate documents to the evidence found at the time the retracement was conducted.

In an actual trial in which the expert for the defendant was being cross-examined, the plaintiff's attorney asked him a question relative to the evidence he used. The surveyor said, "I refuse to answer that." Then the attorney asked the judge to make the expert answer the question. The judge asked the surveyor why he would not answer the question? He responded, "Your honor, I cannot answer that question, because it is hearsay." After a long pause, the judge pushed his glasses to his forehead and stated, "I will worry about that; you worry about what your answer is, and I will worry about what the law is. So, answer the question." This is an excellent example where the surveyor was trying to play lawyer. Had the surveyor understood about his local rule of evidence, he would have known that the answer was an exception to the hearsay rule.

PRINCIPLE 11. *A surveyor is concerned about the relevancy of the evidence and not the admissibility of the evidence.*

2.19 Admissibility of Evidence

Admissibility is a legal question involving whether the court will permit relevant evidence to be admitted so as to be heard and considered by the jury. The basic rule is "Except as otherwise provided all relevant evidence is admissible" [32].

Whether evidence is admissible at a trial becomes quite important in that only admissible evidence should be considered by a jury in reaching its decision. There are many reasons why evidence may be inadmissible, which will not be discussed here. As evidence is used and then introduced for consideration, the attorney usually says, "Your honor, I would like to introduce this evidence into evidence." The judge then asks the opposing attorney, "Any objections?" Then if objections are made, the judge determines whether evidence is admitted or rejected. (In a recent trial, the day of the trial, the defendant's expert recovered a very important piece of evidence, which the plaintiff did not know of. After objections, the judge refused to admit the evidence, but the important element is, the jury did see it.)

Evidence may be admissible for one purpose but inadmissible for a second purpose. This will cause problems for attorneys because, regardless of limiting instructions, juries always feel that "evidence is evidence."

Some reasons that a court will not admit evidence may be the failure to authenticate its origin, hearsay, questions of authenticity, or its being totally unreliable. The question of admissibility is one for the judge to determine.

DEFINITION. *Presumptions of law are inferences that the law expressly directs to be deduced from certain known facts. Presumptions are either conclusive or rebuttable.*

Presumptions are for the purpose of expediting trials by reducing the amount of evidence necessary, and the time to present the evidence. Technically, presumptions are not evidence but are considered substitutes for evidence. A presumption affects only the burden of offering evidence; thus, it becomes a "procedural tool" based on considerations of (1) probability, (2) practical convenience, or (3) public policy.

In applying such a rule, proof can be offered that a properly stamped and addressed envelope was placed in the mailbox; this will give an inference that it was received; thus, the courts will "presume" it was received in the absence of evidence to the contrary.

- **Conclusive presumptions** are those that are irrebuttable, and this, by law, permits no contradiction. A commonly known conclusive presumption is "everyone is presumed to know the law." Whether a person does or does not in fact know the law is immaterial, since no evidence can upset this conclusive presumption. In the absence of pleadings of fraud or illegality, the truth of the facts recited in a written conveyance is a conclusive presumption as between the parties. But there is an exception in the recital of a consideration.
- **Disputable or rebuttable presumptions** are those that may be proved incorrect by other evidence; but, unless proved otherwise, the jury's findings must be according to the presumptions. Common-law presumptions usually have force in the various states, provided they are not in conflict with statutory presumptions or provisions. One who grants a thing is also presumed to grant whatever is essential to its use. Thus, a conveyance of land includes all existing easements necessary for the use of the land, whether said easements are recited or not. The burden of proof is with the person trying to prove that the easements did not pass with the property. Evidence willfully suppressed is presumed to be adverse if produced.

As applied to a surveying issue, presumptions could be as follows: In the GLO surveys, if the surveyor has a GLO plat accompanied by the field notes indicating courses, lines, corner monuments, and parcels were patented to that plat, then the conclusive presumption is that a survey was conducted according to the laws and instructions in effect at the time of the date of the plat. In conducting a retracement, after extensive field work no original evidence is found. Then the surveyor could say that there is a rebuttable presumption that the survey was never conducted. Then in a similar situation, if in conducting a retracement one finds scattered corners, but the field notes do not correlate with the topography on the ground, or that the field notes and the plat agree, but they do not fit the actual lines, the presumption is the survey is a "tent" survey or a "campfire survey."

A rebuttable presumption is one in which evidence can be presented to prove the presumption is in error.

If inferior evidence is produced, it is presumed that the higher evidence would be adverse. In many states a letter duly directed and mailed is presumed to be received in the regular course of mail. This is known as the *mailbox rule*. Each of these presumptions may be overcome by acceptable contrary evidence.

Many rules of surveyors are equivalent to presumptions. Normally, the order of importance of conflicting deed elements is senior rights, intentions of the parties, monuments, measurements, and area. Of course, this is not a hard-and-fast rule, but it is merely a good disputable presumption to be followed until contrary evidence is developed. The surveyor, in the quest for evidence, sometimes discovers or seeks facts for the purpose of proving a presumption wrong, but until he or she proves the contrary, the presumption governs.

Before a presumption can be assumed, the person who wants to seek the benefit must establish the "basic fact" that is the foundation to the "presumed fact." For the most part, courts hold that a presumption is not evidence but is a deduction that must be drawn from evidence.

In looking at evidence, courts have held that *presumptions are evidence or have the effect of evidence*. In using presumptions, the courts and even the parties may find themselves facing legal dilemmas when both parties invoke presumptions on the same issue.

2.20 Inferences as Substitute for Evidence

DEFINITION. *An inference is evidence in the form of a logical conclusion from a set of facts without express directions of the law to that effect*.

Surveyors frequently resort to inferences to prove a given property location. Inferences are not based on imagination or supposition; they are based on probabilities, and the drawing of inferences is a matter of discretion left up to the trier of fact. A failure to speak and explain when it is a duty to do so gives rise to an adverse inference. The negative testimony of a person in a position to see a monument in a particular location supports the inference that the monument was not there.

2.21 Extrinsic Evidence: When Used

Once an agreement or deed is reduced to writing, testimony cannot be used to overcome clear, unambiguous, written words. But if the words are not clear and need explanation, extrinsic evidence, that is, evidence other than the writing itself, may be sought to explain the words. A deed reading "beginning at the southeast corner of Jones' watermelon patch" may require a considerable amount of extrinsic evidence to explain where the southeast corner was located at the time the document was written.

Extrinsic evidence may also be taken to explain a local meaning to a particular word. In Texas and the West, the old Mexican *vara*, a unit of measurement, was used. Extrinsic evidence is sometimes needed to explain the length of a vara, since it was not the same in all localities.

At times, courts have generally taken extrinsic evidence to explain latent but not patent ambiguities in descriptions. A patent ambiguity is a defect appearing on the face of the conveyance itself. A deed reading "a house and lot on Main Street" describes nothing in particular and contains a patent ambiguity that cannot be remedied by other evidence. A latent defect—that is, a defect not apparent on the face of the instrument but apparent when the instrument is applied to matters outside the instrument, can be cured by extrinsic evidence. If an ambiguity has been raised by extrinsic evidence, it is only logical that the courts would allow the same kind of evidence to explain it.

The rigidity of the original rule defining these two types has been greatly relaxed. The current tendency is to regard a description as valid rather than void and to extend the word *latent* to its most liberal meaning. A patent ambiguity is construed to exist only when persons of competent skills are unable to interpret the deed. In general, if a competent surveyor can take the deed and locate the land on the ground from the description contained therein, with or without the aid of extrinsic evidence, the description will be held to be sufficient [33].

The general rule of law is that possession must start under a claim of color of title that purports to be valid. If the deed under which the claim is made is void or insufficiently formed to pass title, the possession is not adverse under our statutes. The description reads, "One tract of land lying and being in the county of the foresaid, adjoining the land of John J. Phillips and Pender, containing 20 acres more or less." This description fails to identify or furnish a means of identifying. It gives neither course nor distance of a single line, nor a single point, stake, or corner anywhere to begin at [34].

Where land is conveyed by a general description, extrinsic evidence is admissible to ascertain the location of adjoining tracts called for, so as to apply the conveyance to its proper subject matter. If with the aid of these the land granted can be sufficiently identified, that is all that is necessary [35].

2.22 Judging Effect or Value of Evidence

The jury judges the effect or value of evidence, but the judging must be in accordance with the laws of evidence. The jury, subject to the control of the court, is the "judges" of the effect or value of evidence addressed to them, except when it is declared to be conclusive. They are, however, to be instructed by the court on all proper occasions of the following:

1. Their power of judging of the effect of evidence is not arbitrary, but one exercised with legal discretion, and in subordination to the rules of evidence.
2. They are not bound to decide in conformity with the declarations of any number of witnesses, which do not produce conviction in their minds, against a lesser number or against a prescription or other evidence satisfying their minds.
3. A witness false in one part of his or her testimony is to be distrusted in other parts of testimony.

4. Testimony of an accomplice ought to be viewed with distrust and the evidence of the oral admissions of a party with caution.
5. In civil cases, the affirmative of the issue must be proved, and when the evidence is contradictory, the decision must be made according to the preponderance of evidence; that in criminal cases guilt must be established beyond reasonable doubt.
6. Evidence is to be estimated not only by its own intrinsic weight, but also according to the evidence that it is in the power of one side to produce and of the other to contradict.
7. If weaker and less satisfactory evidence is offered, when it appears that stronger and more satisfactory evidence was within the power of the party, then the evidence offered should be viewed with distrust.

2.23 Judicial Notice as a Substitute for Evidence

Although not evidence, courts and attorneys may accept judicial notice as a substitute for evidence. Judicial notice does not affect the surveyor directly, but it may affect the manner in which surveys are approached.

Judicial notice is usually used in situations for evidence of absolute certainty to the point that no trial evidence needs to be presented to confirm that it is certain. (On one occasion this author took judicial notice in an action for flooding damages that "water runs downhill.") Because of the nature of this form of evidence, the requirements and rules are somewhat vague and are left up to the discretion of the judge.

Usually, there are two requirements for the judge to take judicial notice of facts or laws, which are: (1) they are generally known within the territorial limits or jurisdiction of the court, or (2) they are capable of accurate and ready determination by sources whose accuracy cannot reasonably be questioned.

One of the very basic presumptions that any litigant assumes at trial is that the court and the jury are totally uninformed about the facts of the case [36]. The duty then falls on the attorney to present the case to the jury and the judge through the presentation of the evidence. Judicial notice states that there are certain facts that do not need to be proved, and thus, the court and the jury can rely on them. Although a substitute for evidence, judicial notice has equal force to evidence.

The entire presumption of judicial notice is that these are facts (evidence) that are so common that each person of average intelligence will (should) be knowledgeable about them.

The student should not get the terms *judicial notice* and *judicial knowledge* confused. They are entirely different. The source of judicial notice may be from textbooks, laws, dictionaries, and encyclopedias that are commonly seen as being accepted. The acceptance of judicial knowledge is not automatic, in that the court has the authority to determine what it will judicially notice.

All courts will take judicial notice of law, including the federal laws of surveying. Also rules and regulations may be judicially noticed, which for the surveyor may be the BLM Manuals and other publications.

Courts will also take judicial notice of scientific facts and mathematical calculations and facts. This could be extended to the measurements that are obtained from electronic distance-measuring equipment.

Judicial notice is a formal part of all trials and, as such, will not permit any judge or jury to substitute personal knowledge for their own. The basic rule that must be remembered is that judicial notice may be taken of any fact of "common, everyday knowledge" that is accepted as being "indisputable" by any person of average intelligence and knowledge [37], but interestingly enough, courts have permitted judicial notice being taken of both judicial knowledge and common knowledge possessed by the average individual that judges assume every informed individual possesses.

In a "whiskered" decision from Alabama, the early Appellate Court wrote, in respect to judicial notice; "Courts are authorized to take Judicial Notice of the United States [*sic*], in this State government surveys in this State, and of the location and the relative situation of the lands officially surveyed and mapped out under the authority and laws enacted by Congress" [38].

When a surveyor is employed as an expert, if certain information is of common knowledge to the surveying community in general, the expert should recommend to the attorney that the attorney seek to have that information accepted as judicial knowledge, and then he or she is relieved from having to plead the facts during the course of the trial.

2.24 Weight of New and Old Evidence

In a boundary dispute being settled in court, each party presents evidence that each hopes tends to prove his or her side of the case. After all evidence is presented, the judge decrees a property position as based on law, facts, and evidence. After a period of time, if the decree is not reversed by a higher court, the decree becomes final and the law then becomes controlling for that court.

The judge has the advantage: He or she draws a conclusion from the evidence and facts presented and from knowledge of law. After a decree is final, discovery of new evidence does not alter the property or boundary line location decreed. Because of this situation, it makes it imperative for the testifying surveyor to have sufficient and creditable evidence on which to make the expert's decision.

The surveyor, when making a boundary survey, gathers evidence that was created and left by the original surveyor. He or she then makes findings and draws conclusions and finally develops an opinion and the sets the survey or boundary markers. But the surveyor's findings do not have the finality of a court decree. Another surveyor, uncovering additional evidence, may come to a different conclusion and locate the lines in another position. The second position might be the correct location. Yet another surveyor might be more diligent and uncover further evidence that proves still another location to be proper. Thus, it is of the utmost importance that a surveyor seeks and finds all the evidence in the first instance, irrespective of costs. Many so-called lost monuments have been found on later surveys. In fact, *one of the major causes of disagreement between surveyors relates to the lack of discovery of sufficient and creditable evidence* at the time of the initial survey. If every surveyor