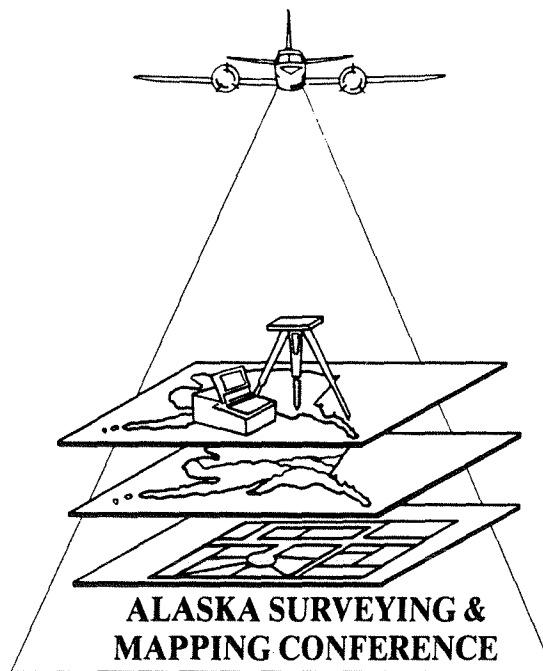


Alaska Surveying and Mapping Conference

Mineral Survey Retracements

Instructor:
John "Steve" Parrish

April 3, 1992

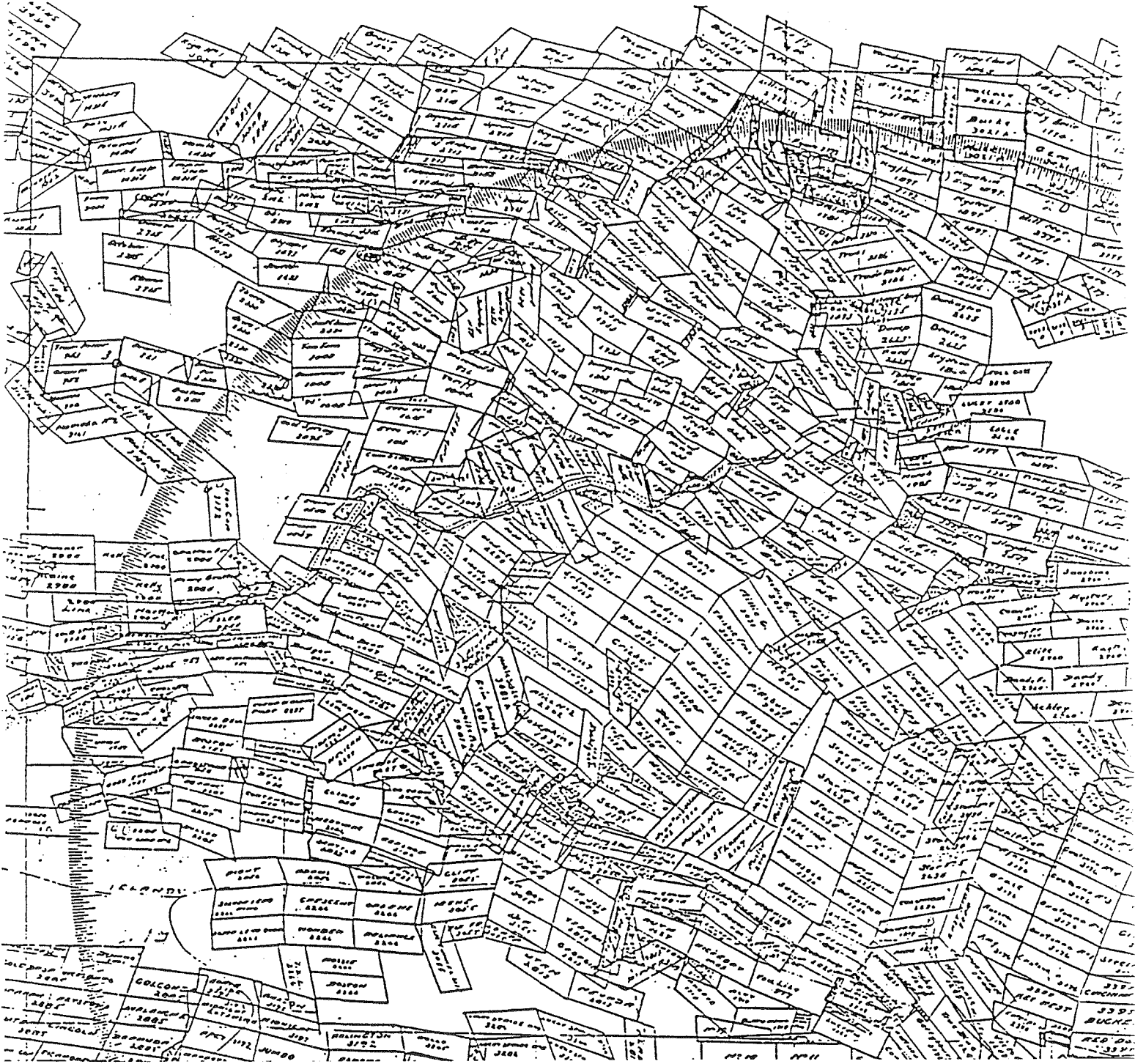


March 30 - April 3, 1992

Anchorage Hilton Hotel

John K. Bennett

MINERAL SURVEY RETRACEMENTS



a workshop by JOHN S. PARRISH, RLS

27th ANNUAL ALASKA SURVEYING & MAPPING CONFERENCE

April 3, 1992 - Anchorage, Alaska

MINING SURVEYS

ABOVE GROUND

26-1. BACKGROUND

A variety of textbooks is available containing opinions, instructions, and legal citations dealing with retracements, resurveys, restoration of original corners, and subdivision of sections of the rectangular survey system. Additional texts cover commercial subdivisions dealing with survey, resurvey, and restoration principles of lots, easements, air rights, rights-of-way, and other related urban land development practices. Riparian law fills numerous volumes and restoration of lost corners on many types of metes-and-bounds (homestead entry surveys [HES], desert land claims [DLC], small holding claim [SHC], and land grants) parcels have been challenged in the courts, resulting in some well-established common law practices being upheld and published.

In spite of the ever-increasing library of information being written as a guide for surveyors, there remains a critical void concerning resurveys of a patented mineral survey. No established common law can be found to draw on for principle or instruction; the **Manual of Surveying Instructions** (hereinafter referred to as the **Manual**) contains almost nothing on the subject and the **Mineral Survey Procedures Guide** (1980) has only one-and-a-half pages on resurveys of patented mining claims. Hereinafter, any reference to "mineral survey" will mean "patented mineral survey."

There are three typical forms of mineral surveys: (1) lodes, (2) millsites, and (3) placers. In most cases, lost corners of mill sites and placers are restored by the more commonly know "grant boundary" procedure (see **Manual** Sec. 5-44). A grant boundary solution is generally acceptable when there is an insignificant deviation found between the corner monuments remaining and the record plat/field notes. Most difficulties arise when the recovered corner monuments differ considerably from the record, and/or unrecorded gaps/overlaps are identified during the retracement phase of the resurvey work. The following discussion will center primarily around the patented lode mineral survey.

26-2. HISTORICAL DEVELOPMENT OF MINERAL SURVEYING PROCEDURES

Mineral surveys started in the early to mid-1800's in the southeast portion of the United States. During the Gold Rush days of the mid-1800's, surveys were made under various rules established by local mining districts or political entities. Survey procedures, monumentation, and recordation varied dramatically, often lacking in quantity and quality. Beginning in 1865, several federal mining laws were enacted, the most significant being the Act of May 10, 1872. This 1872 act provided the General Mining Laws that are still in force today, with the addition of certain amendments. Specific standards and procedures for surveying mineral claims were detailed and have remained essentially unchanged. Chapter 10, "Mineral Surveys," of the 1973 **Manual** consists of eight pages that briefly guides the Deputy Mineral Surveyor on survey requirements and provides only hints for a retracement surveyor to follow.

Special Instruction issued to the Deputy Mineral Surveyor by the former General Land Office (GLO) and today's Bureau of Land Management (BLM) contains detailed instructions for surveying a mineral claim for patent. Additionally, several books have been written and published providing detailed information on mineral surveys. Most of them contains similar information. **Mineral Land Surveying** by James Underhill, published in 1906, typifies this information and will be referenced on occasion throughout the discussions to follow.

Some significant and specific procedures govern surveys of mining claims that differ from the rectangular system or metes-and-bounds surveys such as homestead entry surveys, desert land claims, or land grants. Survey closure is required to be 1/2000, while lode claims may not exceed 1500 ft in length nor more than 300 ft in width on each side of the center lode line. Measurements to bearing trees are made to a cross X on the face of the tree (as opposed to the center.) The survey is paid for by the claimant and only duly authorized Deputy Mineral Surveyors can perform mineral surveys for patent. Other important aspects involve the survey's intent with respect to discovery points, center lode lines, parallelity of end lines, and extralateral rights, to name a few.

26-3. COMMON SURVEYING PRACTICES

Gathering and correctly interpreting all previous survey notes is imperative. Of equal importance is a knowledge of the actual field procedures and equipment used, though in conflict with that actually recorded. Experienced surveyors recognize differences and utilize their knowledge to recover difficult original evidence and resolve record/physical conflicts in harmony with the intent of original monumentation. It is important that surveyors make note of actual or apparent original surveying practices that conflict with recorded field notes and prescribed procedures.

Underhill's opening paragraph for Chapter 4 of *Mineral Land Surveying* offers some insight on common practices and anticipated results. As he states, "About the simplest survey that the western surveyor is called on to make is that of a lode location. It is, however, somewhat complicated by the fact that as a rule he is assisted by the claimant himself in the work and thus often lacks an efficient assistant, with the result that the character of the results suffer."

It is important to note that Chapter 5, "Surveying for Patent," contains the following: "The deputy surveyor then surveys the claim exactly as described for the location survey, except that the work is done much more carefully, and with greater safeguards." Forward thinking deputy surveyors would usually survey a location as though for patent, thus saving efforts in redoing a survey after the patent survey request was authorized. The only additional work remaining was to mark the corners and accessories with the assigned mineral survey number prior to completion of "running" field notes.

Examination of a typical set of mineral survey field notes of a lode will indicate: (1) starting at the discovery point, (2) running along the center lode line to a center end-line point (monumentation optional depending on locale), (3) measuring to corner no. 1, (4) courses and distances between each successive corner (including the opposite center end-line point), and (5) physical closure back to corner no. 1. If the field notes read differently, they would be rejected and the surveyor asked to rewrite them. In reality, the actual field procedure was probably as follows: Beginning at the discovery point; thence along the center lode line to a center end-line point; thence offsetting left and right to the lode corners; thence again from the discovery point measuring the calculated distance in an opposite direction not to exceed 1500 ft along the center lode line to the center end-line point; thence offsetting (parallel to the opposite end line) left and right to the lode corners.

In many cases, the side lines were never actually run as recorded in the field notes. A noticeable lack of topographic calls along side lines over difficult terrain is a positive indicator of that common practice. Additional support for this method is found in *Mineral Land Surveying*, where Underhill discusses survey procedures for lode locations. Excerpting from Chapter 4 he states, "...at which point the claimant having desired to end his claim, a right angle is turned off (from the center lode line), and the stakes set...on each side of the center line." Quoting further: "We now extend the line through No. 5 and No. 6 (tangent points on the center lode line), and here knowing that the survey can be completed with another sight, the previous

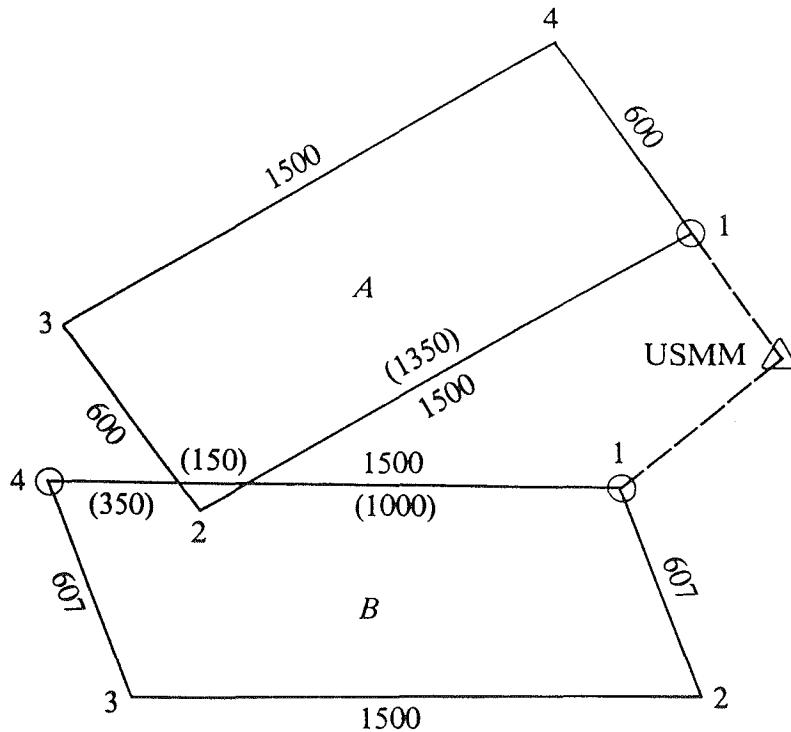
measurements are reduced to horizontals, the total subtracted from 1500 and the result laid out. Corners No. 3 and No. 4 are then set as for the westerly end." Retired and active Deputy Mineral Surveyors confirm these procedures and commonsense analysis of existing conditions found during survey retracements verify the practice.

When multiple side-by-side lodes were run, the center lode line was seldom traversed and corners set by the shortest procedures available. Underhill suggested that "In the case of groups of claims, the surveying may be often greatly simplified by a little forethought. This is evident in the case of those locations which lie side by side when one surveyed center line may serve for the whole group, the end lines being run from its two ends."

26-4. SURVEYING FOR PATENT

It is unnecessary to recite the many requirements of surveying for patent. It is appropriate, however, to strongly recommend that all practicing land surveyors possess and become familiar with the BLM Manual, the BLM **Mineral Survey Procedures Guide**, and at least one or more textbooks similar to Underhill's **Mineral Land Surveying**. These publications outline the minimum requirements for surveying mining claims and provide today's surveyor with valuable insight in understanding principles, procedures, and intent of a mineral survey.

FIGURE 26-9. Senior survey A and junior survey B showing tie between line 1-2 of A and line 1-4 of B.



Legend: \triangle USMM found
 \circ Lode corner found

26-5. INTENT-PARALLELISM, DISCOVERY, MONUMENTATION

Land surveying is more an art than a science. Recognizing the difference is important if valid and successful professional surveying services are to be provided to a client. Some simple decisions, when only one lode corner appears lost, are to apply a "grant boundary" solution; reestablish by record courses/distances; or reset from record calls to nearby lode corners.

Lode sidelines are often reestablished on the ground from calls to points on lines of adjoining lodes. Referring to figure 26-9, a surveyor may be asked to locate the line between corners 1 and 2 of lode A. Corner 2 of lode A is assumed lost and a tie to line 1-2 of lode A is contained in the field notes for lode B. These notes state that line 1-2 of lode A is intersected at a point 500 ft along the course from corner to 4 to corner 1 of lode B and is 1350 ft from corner 1 of lode A (or called 150 ft from corner 2 of lode A). Clients desiring the least expensive survey possible, coupled with some surveyors' blatant acceptance of only record ties, often result in erroneous establishments of desired deed lines.

FIGURE 26-10. Intersection point x established from record ties of survey B to line 1-2 of survey A. Corner 2A was assumed lost.

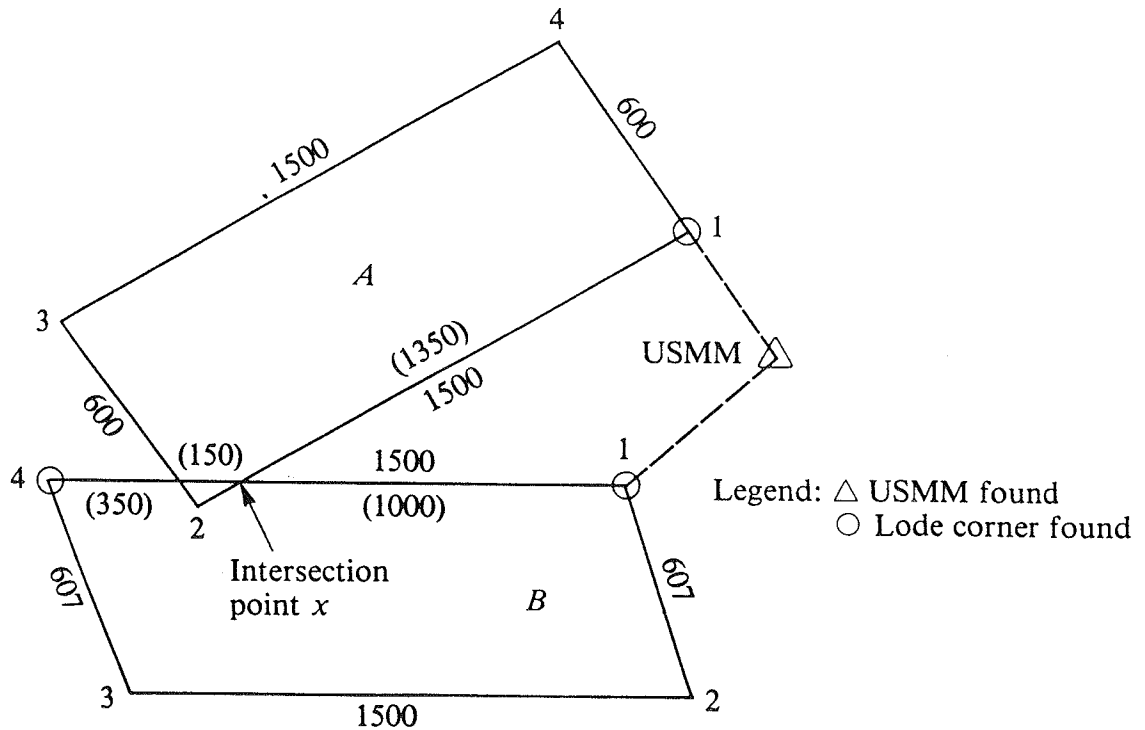
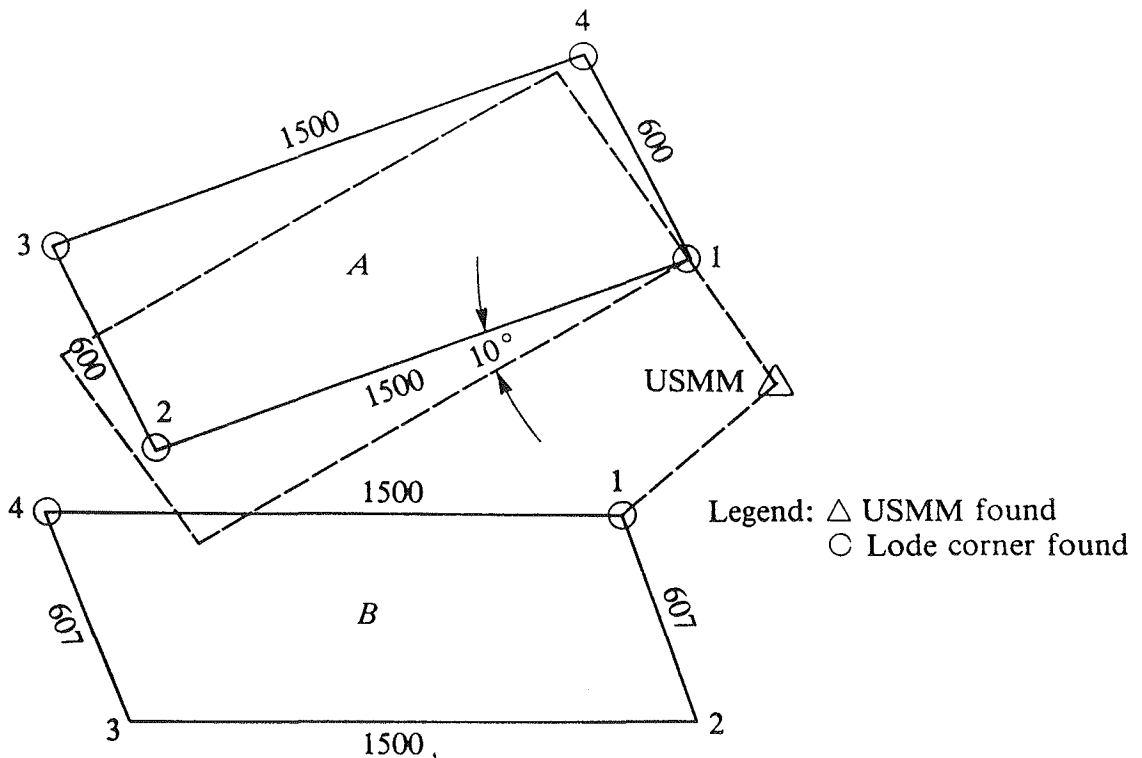


Figure 26-10 illustrates that point x has been established strictly from record and field ties to only corner 1/lode A and corners 1-4 lode B. Figure 26-11 shows that corner 3 and 4 of lode A were eventually located, and lode A actually set differently on the ground than the record indicates. The initial blunder appears to be a "computed" tie for an intersection lodes A and B after having tied only to the United States Mineral Monument (USMM). Such computed ties are common, and a junior lode surveyor is required to note conflicts with adjoining lodes whether or not actual corners are located. After recovering corners 3 and 4 of lode A, it was a simple matter to search at record distances from corner 1 and 3 to find corner 2.

FIGURE 26-11. **Corners 3 and 4 of survey A were located, which led to location of corner 2A. A 10° bearing blunder with survey A is noted. Line 1-2 of survey A was erroneously reestablished by using only the computed ties from survey B.**



A well-established principle of the configuration for a lode is that end lines are intended to be parallel. Figures 26-9, 26-10, and 26-11 demonstrate that each lode must stand on its own merits, both in monument control and intent of patent for a specific claim. Adjoining surveys can be used as secondary control, when physical evidence of a specific lode is totally lost. Actual existence of parallel end lines is similar to the supposition that all regular 1/4 corners are on line and at midpoint between section corners on either side. Seldom is this the case, but end lines are usually found to be substantially parallel. This principle, or intent, must be carefully considered during resurvey work on a lode claim.

Another important element of lode surveys is the significance of discovery points. Without a discovery point, the lode could never have existed. Claimants must have worked their discoveries sufficiently to validate a lode claim, and the location survey had to begin at the discovery point. Before a mineral claim is assigned a number and an order for survey issued with the intent for patent purposes, the discovery will be witnessed on several occasions. If there is a total lack of corner evidence, a discovery point cannot be found, improvements are nonexistent, and the ground has not been significantly disturbed by man or nature, it is suggested a search for the lode be made elsewhere. It is not uncommon to eventually locate an actual claim several miles away from map projected locations. Discovery points alone, if verified beyond reasonable doubt, can be used to reestablish lode locations in lieu of erroneous ties to secondary monuments, lines, or topographic features.

The most significant components of a mineral survey are its monuments. These controlling points form the extent and terminus of the connecting lines for a lode. Acreage is subservient to actual monuments and the area they contain. United States Code Annotated, Title 30, **Mineral Lands and Mining** states in subsection 34: "...The said monuments shall at all times constitute the highest authority as to what land is patented, and in case of any conflict between the said monuments of such patented claims and the descriptions of said claims in the patents issued therefor the monuments on the ground shall govern, and erroneous or inconsistent descriptions or calls in the patent descriptions shall give way there to." Corners and lines of adjoining surveys should be used as a last resort and only when all evidence of controlling corners for the lode being resurveyed are determined lost.

26-6. RETRACING THE PATENT

Once equipped with a better understanding of the surveying procedures and intent of a patented mineral claim, a retracement can be approached with sharpened logic and greater success. Searching through and collecting all written field notes pertaining to the patented lodes is essential. Plats are part of the notes and require a thorough search for amended, revoked, and adjoining surveys. Notekeeping styles varied greatly among Deputy Mineral Surveyors, and each state accepted differing formats.

Be sure to acquire all the original field notes. Often, only notes containing descriptions around lodes are secured, while pertinent calls to accessories, manmade structures, and natural features were recorded in the "general description" following the lode traverse notes. When reviewing notes of multiple side-by-side claims, read them carefully to determine which lode corner the call relates to. Occasionally, accessories are recorded on the face of a plat in lieu of field notes. When dealing with a corner common to two or more claims, be sure all claim descriptions are secured and carefully read. It is not uncommon to record a bearing tree with one claim and delete the reference in the notes of an adjoining claim. Species, diameters, markings, bearings, and distances sometimes conflict between notes of two adjoining surveys. If only one set of notes is used, and the correct information is contained in the second (unused) set of notes, a surveyor could fail to recover evidence of an original monument.

Many mineral surveys were done with intent to patent but later revoked for various reasons. Monuments were seldom destroyed on these revoked surveys, and valuable ties may exist to aid in recovering evidence of adjoining patented claims. Though a corner of a revoked survey does not control a patented claim, it may prove valid for locating or reestablishing corners of an adjoining claim called for in its notes.

Never attempt to reestablish a missing lode claim corner without searching out the evidences of all lode corners. A blunder along one end line or on the center lode line may be overlooked if all corners are not searched for.

Many mineral survey corners are overlooked because a surveyor has not measured from the correct point on a bearing tree. Sections 10-34 and 10-38 of the 1973 Manual provide instructions for measuring distances to bearing trees: "The exact point on the tree...to which connection is made is indicated by a cross or other unmistakable mark." Measurement to a cross on the face of the blaze or to the blaze without a cross has been standard practice for mineral surveys. **Figure 26-12** illustrates the differences between distances measured from the centers of two bearing trees instead of to the face. Tree diameters and steepness of the hillside where the corner was set contribute to success or failure in finding a rotted wood post below ground level, if distances are measured from the wrong points on the bearing trees. Bearing differences often are slight, providing little awareness of error by a retracement surveyor.

FIGURE 26-12. **Two original bearing trees. Original corner monument is wood post-rotted portion remaining below ground level.**

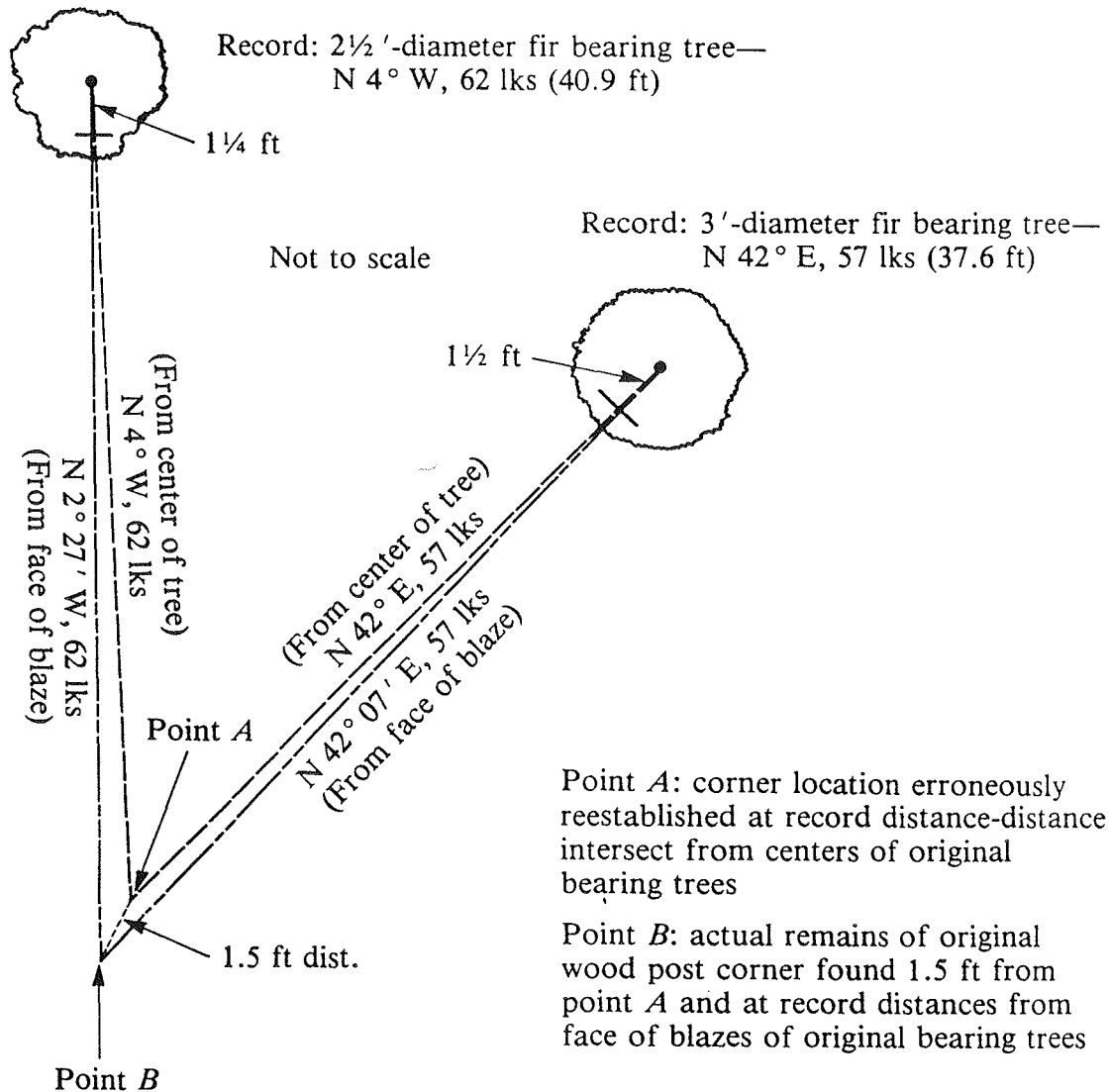
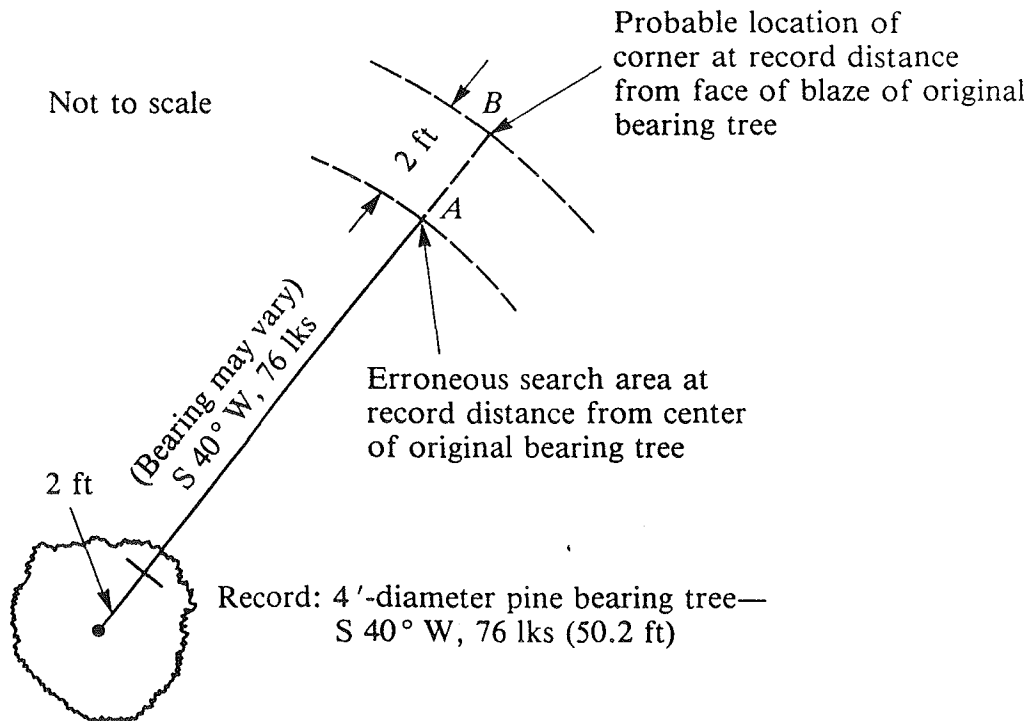


Figure 26-13 shows only one original bearing tree. Since bearings were usually less accurate than measurements, it is necessary to search left and right of the reestablished bearing off the bearing tree. With larger diameter bearing trees, a crucial mistake could be made if distances are measured from the tree centers.

Occasionally, a mineral surveyor employed crew members with experience in rectangular survey systems. These employees, through habit, may have measured distances to the centers of bearing trees, even though their instructions were to measure to the face or cross. When such a situation is suspected, it must be evidenced by existing corner to bearing tree measurements of the lode corners being retraced.

FIGURE 26-13. **A thorough search at point B, left and right of the record bearing from the bearing tree, is the most likely location to find the original corner.**



26-7. CONFLICTING PATENT LOCATIONS

Not uncommon to mineral surveys are erroneous locations of claims on maps, in descriptions, or by field-note ties included with subsequent surveys (either rectangular or metes and bounds). Searches for patented claim locations must be in an area of known mining activity. Placers are seldom found on ridges; lodes will often provide two or more discoveries; and millsites are usually located where buildings can be erected and access is easy. When all signs of such conditions are absent, start looking elsewhere for the claims.

Government surveyors (GLO, BLM, and Deputy Mineral Surveyors) were and are instructed to make actual ground ties to corners of conflicting mining claims and note crossing of claims along section lines. If these instructions were followed explicitly, such record ties could be used with confidence to reestablish apparent lost corners of mineral claims. Unfortunately, short cuts were and are still being made, leaving a challenge when locating corners of mining claims. Figures 26-14 and 26-15 are actual, characterizing situations discovered during subsequent filed investigations of lode surveys.

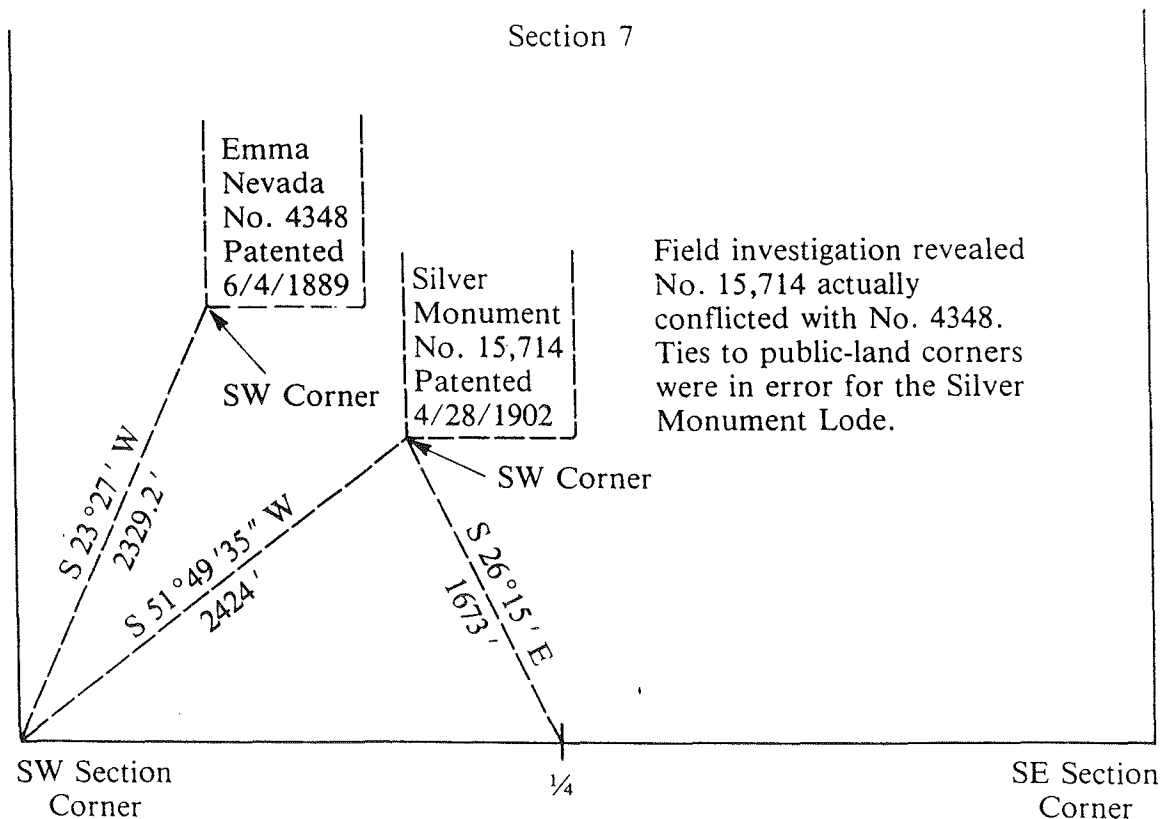
CASE STUDY OF 1883 MILLSITES: Five adjoining millsites were surveyed in 1883 and tied to their parent lode and a USMM on a ridge high above the millsites (figure 26-14). In 1922, a GLO survey of the line between sections 21 and 22 states: "...47,19 chs. Intersect line 3-4 of Allen Millsite, Survey

CASE STUDY OF 1904 IBLA OPINION: In 1904, the Interior Board of Land Adjustments (IBLA) rendered an opinion concerning the locations of two patented lode claims. A patent had been issued for the Emma Nevada Lode (Survey No. 4348) on December 14, 1886. The Silver Monument Lode (Survey No. 15,714) received patent on April 28, 1902. Both were tied to the southwest corner of section 7, with the Silver Monument Lode tied also to the south 1/4 of section 7 (figure 26-15). Later in 1902, the grantee of the patented Emma Nevada Lode filed a protest against the patent application for the Silver Monument Lode, claiming a conflict existed in the field. The protest was dismissed on grounds that no evidence of such conflict was existent by examination of notes and plats for the two lode claims. The Emma Nevada Lode grantee appealed, and a field investigation was eventually made, confirming existence of a conflict between the two lodes.

Defense for the patentee of the Silver Monument Lode stood firm on the premise that no conflict existed, due to the fact that the records did not conflict and ties to the section and quarter-section corner were an integral part of the locus (location) of a patented claim. Argument was finally reduced to the physical locations of the corners of each lode, without regard to their ties to corners of the public survey or United States Mineral monuments. The principle of "monument control" was upheld, with patent being rejected to any portion of the Silver Monument Lode actually in conflict with the Emma Nevada Lode.

Examination of the Emma Nevada/Silver Monument Lode conflict reinforces the fact that care must be used when reestablishing lost mineral claims from corners of the public survey, USMMs, or other recorded calls to adjoining claims. Similar situations are more the exception than the rule but exist frequently enough to warrant special attention when no physical evidence of the lode is locatable.

FIGURE 26-15. **"Record" bearings and distances from southwest corner and south 1/4 corner of section 7 to southwest corners of surveys No. 4348 and No. 15,714. Plats and notes did not indicate a conflict between lodes.**



26-8. RESTORATION OF LOST OR OBLITERATED MINERAL SURVEY CORNERS

Legal precedence concerning reestablishment guidelines for lost mineral survey corners is lacking, so careful consideration of the intent and original survey procedure must influence resurvey decisions. Information shown in figure 26-16 provides three solutions: (A) parallel end line/sideline, (B) grant boundary, and (C) record end line/sideline. No solution will restore the lode close to its record size.

Solutions A and B provide essentially the same results but A maintains strict parallelity of end lines with slightly more acreage than B. Bearings along the end and side lines are close to record and either solution A or B would be difficult to argue. Solution C, however, least resembles the intent of the original survey, resulting in substantially nonparallel end lines, notable disproportionate side lines, and an acreage slightly larger than patented. Parallel end lines should be the decisive factor with the given conditions.

Figure 26-17 adds a more difficult conflict to the same lode, with an apparent 2° blunder along the westerly end line. When both distances and bearings depart significantly from record, a grant boundary solution (solution B) provides a poor resemblance to the original record intent. The record distance-distance solution C still violates the intent of parallel end lines. Again, the recommended solution is A.

Figures 26-16 and 26-17 were purposely selected with final acreage being less than that contained in the patent to emphasize the principle that acreage is nearly always the last consideration. If the lode had been long on the side line, then excess acreage would have been enjoyed by the patents.

The 1980 **Mineral Survey Procedures Guide** provides brief direction for reestablishing missing lode corners where one, two, or three corners are missing. The opening paragraph appropriately states, "There is no hard and fast rule for establishing missing corners of mining claims. The method should be selected that will give the best results, bearing in mind that end lines should remain substantially parallel." Many surveyors agree with solutions to situations A, B, and C of figure 7 (p. 58 of the Guide). The Guide recommends using the broken boundary (nonriparian) or grant boundary method in many cases, but caution is again recommended if significant differences are found between the actual and record bearings and distances.

26-9. GAPS AND OVERLAPS NOT OF RECORD

Contained among the sporadic and overlapping mineral survey complexes are thousands of platted gaps and overlaps. Since mineral surveys are predicated upon a claim of mineral deposit (and associated millsites), there exists no need or provision to patent all the surface area into neat manageable blocks of land. Seldom are platted gaps or overlaps actually the same dimensions as recorded, and frequently they are much larger or nonexistent. In addition to the inequities found with the platted gap or overlap is the reality that thousands of gaps or overlaps not officially platted are discovered during resurveys of mineral claims.

Mineral claims were often surveyed adjoining each other, with corners common to two or more claims. There is no doubt that all claim lines are common (figure 26-18). When claims are offset with corners called along the lines of adjoining claims, a potential for gaps or overlaps exists. Referring to figure 26-19, the record notes and plat for lode B call a portion of line 1-4 (lode A) common with line 2-3 (lode B). Bearing and distance from corner 2 (lode B) is called to corner 1 (lode A); line 2-3 (lode B) is "along line 1-4" (lode A); corner 4 (lode A) is called along line 2-3 (lode B). With all these record calls, one would expect to find common lines between lodes A and B. Unfortunately, such common lines seldom exist. Many discrepancies are found with the record, and it becomes the responsibility of a surveyor to identify the lines of specific claims.

FIGURE 26-16. Lode corners 1, 2, and 3 located. Corner 4 missing. Recovered end line/sideline close to record bearing but 20-ft blunder found on sideline.

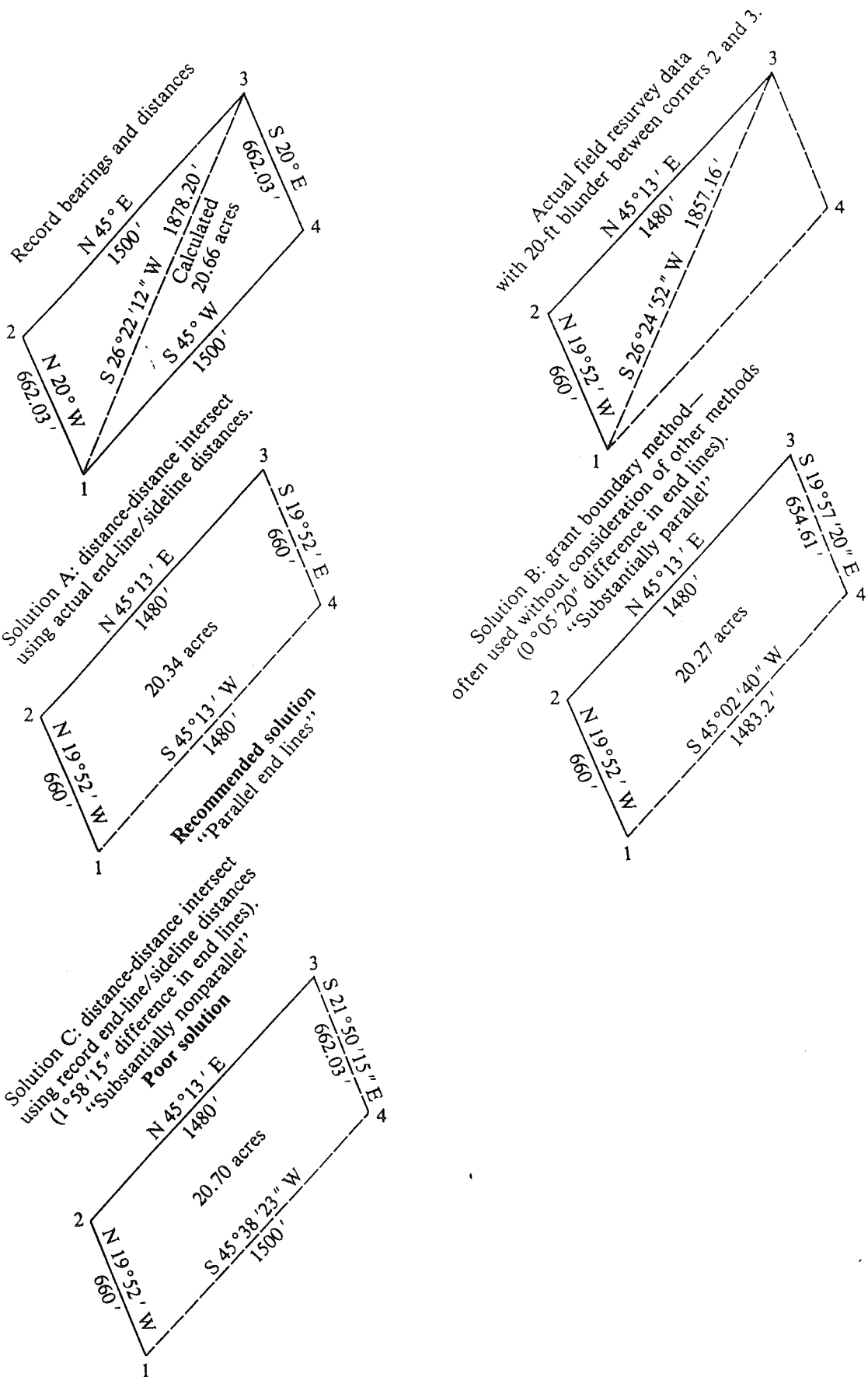


FIGURE 26-17. **Lode corners 1, 2, and 3 located. Corner 4 missing. Recovered end line/sideline substantially different from record in both distance and bearing.**

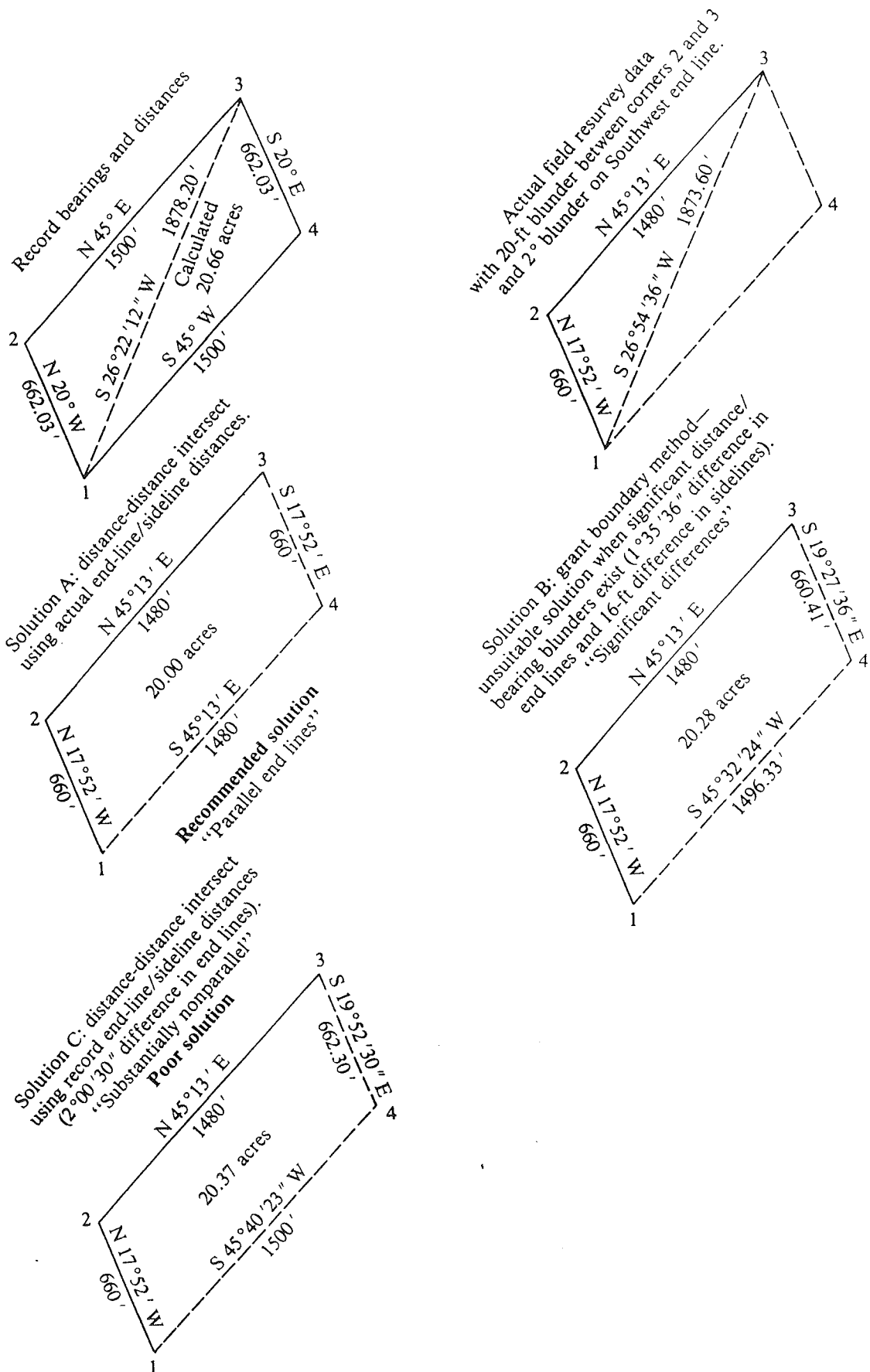


FIGURE 26-18. **Corners common to several claims. No gaps or overlaps exist.**

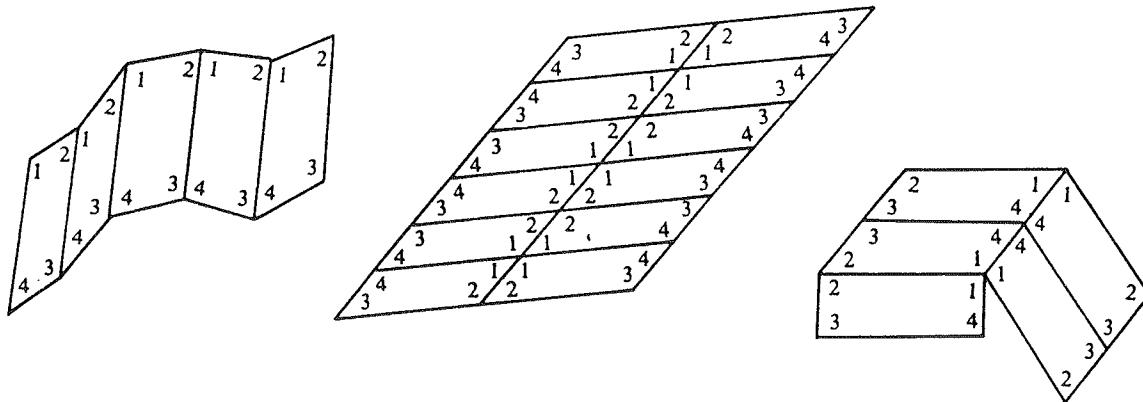
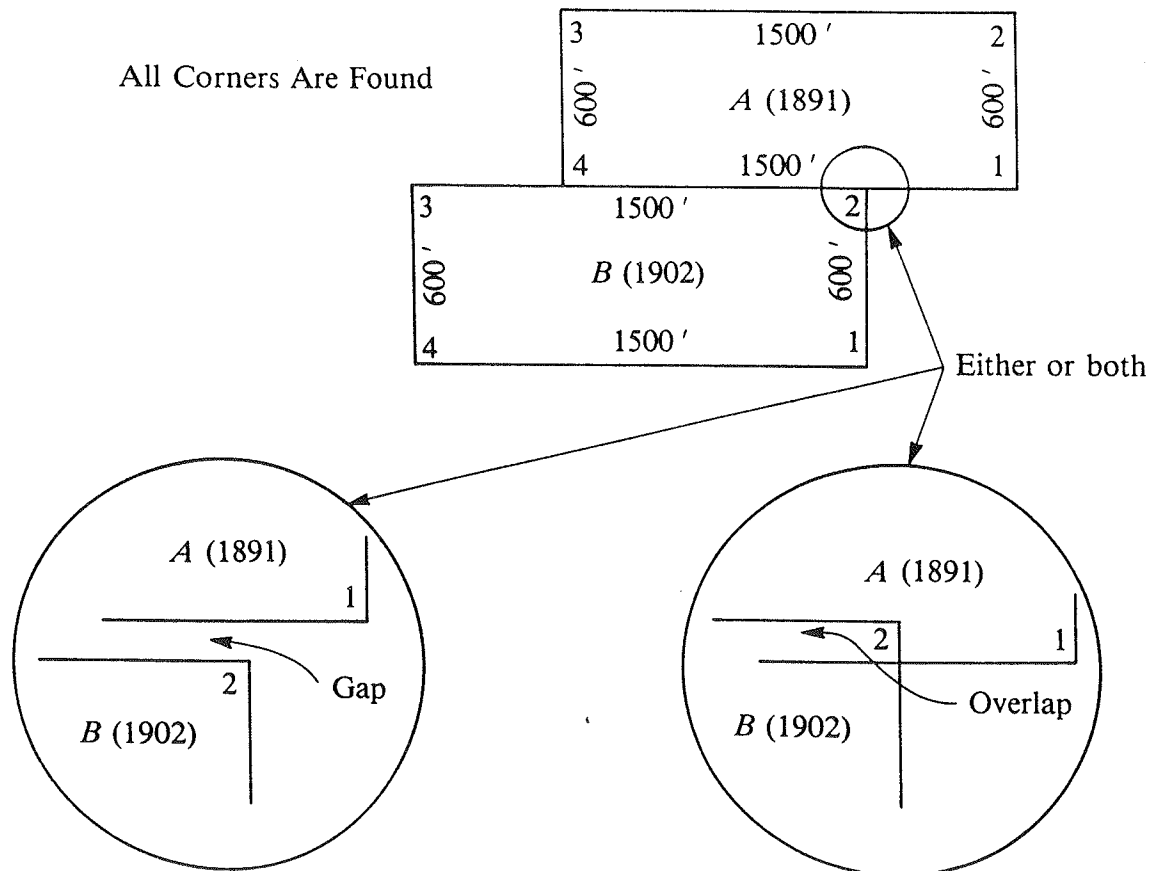


FIGURE 26-19. **Monuments of the specific patented lode control bounds for surface ownership. Gaps and overlaps are often discovered (not created) during resurvey.**



A tendency may exist to "fill in the gap" and ignore the "overlap." Analysis of conditions leading up to the development of unrecorded gaps or overlaps is necessary at this time. Lode A, in figure 26-19, was surveyed prior to lode B and patent was issued with location and acreage strictly dependent upon the positions of corners 1 through 4. If no end line or sideline monuments were set, then lode A would be delineated by straight lines between the successive corners. Lode B was surveyed several years later and patent was also issued, based strictly upon corners of lode B. If lode B actually conflicts (overlaps) with lode A, then surface ownership will remain with lode A for that portion of conflict. When lode B is discovered a distance away from lode a, then a gap is identified and title to the strip of land is vested in the owner of record adjoining lodes A and B.

CASE STUDY OF ABUNDANCE LODES: Another example of a gap or overlap situation can be found in figure 26-20, where corner 6 of Abundance Lode is found 27 ft on either side of line 1-4 of Abundance No. 2 Lode. A field survey reveals that line 5-6 is substantially parallel with line 2-3 of Abundance Lode. There is no legal justification for moving corner 6 onto line 1-4 of Abundance No. 2 Lode. Conversely, creating an angle point at corner 6, along line 1-4 of Abundance No. 2 Lode, would increase or decrease the acreage of Abundance No. 2 Lode without defensible reason.

When a mineral survey corner is lost, such as corner 4 of lode B (figure 26-21), and called for on the line of an adjoining claim, it becomes imperative to retrace all existing corner locations prior to reestablishing the lost corner. When a blunder is identified in distance and/or bearing, the claim boundaries must be reestablished with closest conformity to the original location of the claim corners. With the discovery of a 2° blunder between lodes A and B, and the relatively accurate lengths of the known end and side lines of lode B, missing corner 4 cannot logically be reestablished on line 1-2 of lode A.

FIGURE 26-20. Gaps or overlaps—monuments of the patent, control the patent (location on the ground).

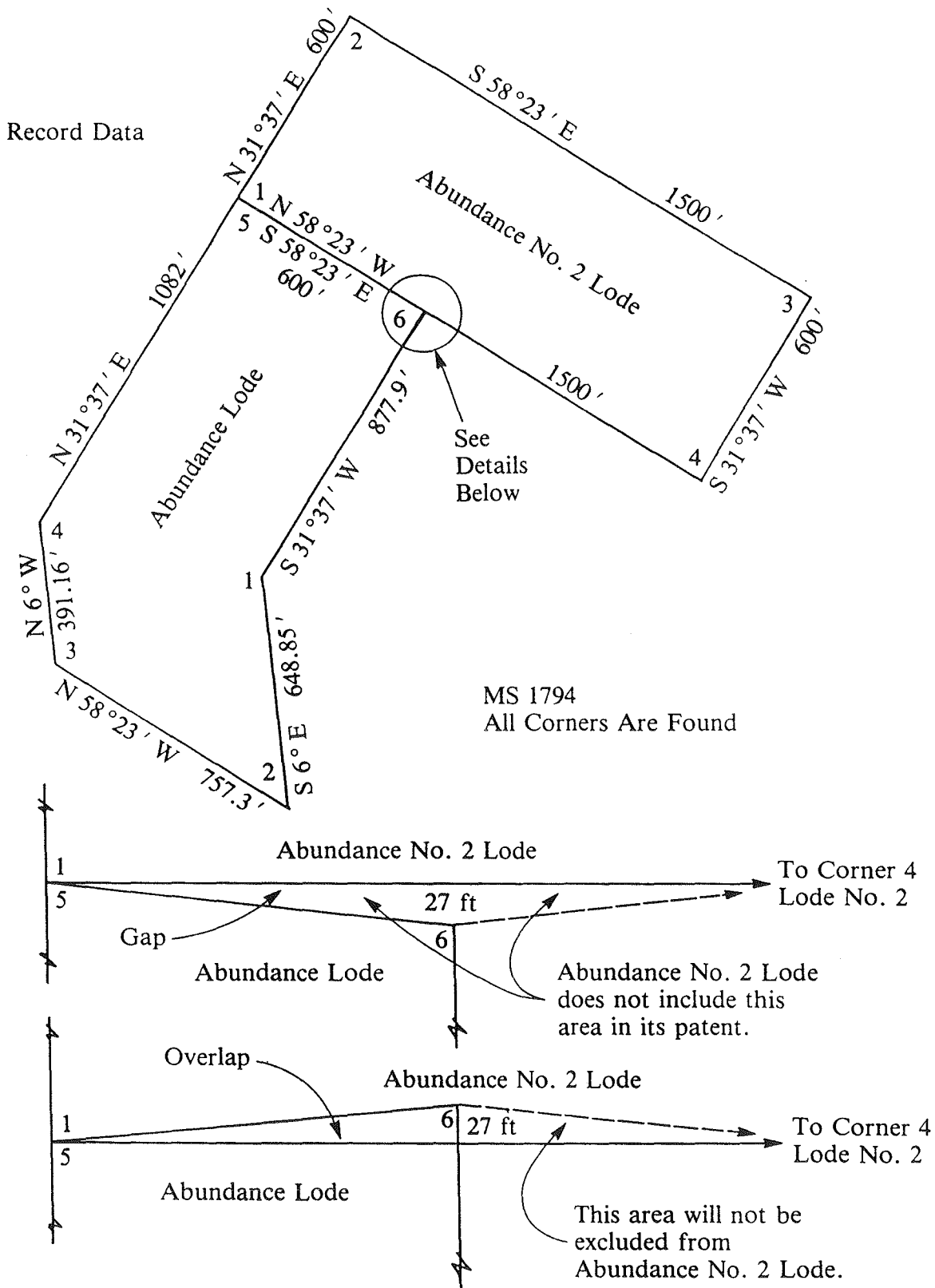
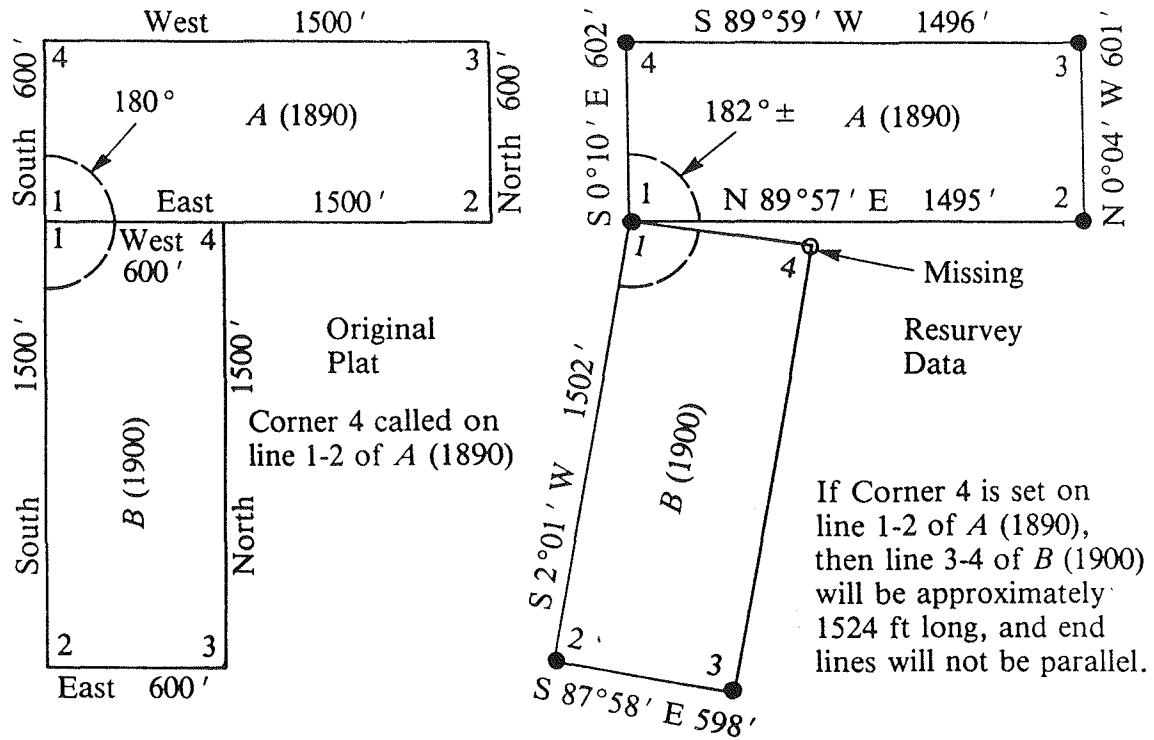


FIGURE 26-21. **Missing corner 4 of B (1900) is reestablished by a distance-distance intersect from corners 1 and 3 of B (1900), using existing end line/sideline distances of B (1900). A gap will exist between A and B.**

Missing Corner: Called for on "Senior Line"



Legend: ● Found Corner

29-10. SUMMARY

Examples have already been discussed wherein ties to USMMs and public land corners have been determined erroneously. Distant ties are more likely to have been computed, less accurate in measurement, and thus not as valuable in reestablishing missing mineral claims or claim corners. When physical evidence conflicts with record ties and no reasonable solution is apparent, it may simply evolve to the principle of "closest and best." Courts usually decide on the validity of a survey procedure based on a preponderance of evidence. If surveyors can demonstrate reasonable effort in having gathered all the evidence, logically explain their solutions, express a good working knowledge of the background and intent of an original survey, then they will likely be successful when survey projects are challenged in court.

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AMERICAN APEX LAW

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ABSTRACT

In American mining the definition of mineral rights in exploitation of vein-type deposits is complex. In explanation of this, first, a careful definition of terms will be specified. Second, an historical background will be mentioned based on early European practice. Third a sequence of mining district, state, and U.S. federal statute laws will be quoted. Fourth, the test case of the famous Pelican-Dives mining lawsuit that was litigated in Georgetown, Colorado, will be mentioned. And fifth, the litigation due to apex law interpretation at Butte, Montana, and Kellogg, Idaho, will be discussed. Finally, a summary will be given of the legal basis for U.S. mine surveyors to use in determining underground boundaries for a vein-type mineral deposit.

AMERICAN APEX LAW

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DEFINITIONS

Terms used in American mining that are important in apex law include vein, lode, lead, ledge, apex, wall rock, strike, dip, sideline, endline, and extralateral right. Paul Thrush in his *Dictionary of Mining, Mineral, and Related Terms* (U.S. Bureau of Mines, 1968) defines a vein as a zone or belt of mineralized rock lying within boundaries clearly separating it from neighboring rock. A lode is the Cornish miner's term for a vein and also derives from whatever formation the miner could be led or guided by to find ore. A lead (pronounced leed) is a synonym for a vein or lode with the connotation of the miner being led or guided as in "lode" above. A ledge is a projecting outcrop or vein that is mineralized. It also has a separate meaning of a horizontally bedded rock such as in a quarry. Apex in mining terminology means the end, edge, or crest of a mineral vein nearest the surface; usually applied to the surface outcrop of a vein. Wall rock is the country rock (usually non-economic) bounding a vein on each side. If the vein is non-vertical the hanging wall is above the miner working in the vein and the footwall is beneath him. Strike means the direction or bearing of a horizontal line within an inclined vein. Dip is the angle of the vein from the horizontal and is measured at right angles to the strike. Sideline is the mining claim boundary intended to be parallel with the strike of the vein. Endline is the mining claim boundary across the strike of the vein. The extralateral right is the key term in American apex law and means the right to mine in the vein, whose apex occurs within the surface mining claim boundaries, downdip outside the sideline projected vertically downward.

HISTORICAL BACKGROUND

Agricola in his book, *De Re Metallica*, published in Latin in 1556 and translated by Herbert and Lou Hoover in 1912, describes the extralateral rights of ancient origin as follows: "If the vein descends vertically into the earth, the boundaries similarly descend vertically; but if the vein inclines, the boundaries likewise will be inclined. The owner holds the mining right for the width of the meer [42 feet], however far the vein descends into the depths of the earth." Van Wageningen in his 1918 book, *International Mining Law* comments on *De Re Metallica* that this extralateral right only held for fissure veins and not for bedded or massive deposits. Early Spanish mining laws allowed the claim locator to additionally claim down dip alongside the original claim which included the apex only if that surface was unoccupied. The Spanish decree of 1584 allowed the miner following ore to mine outside of his boundaries (projected vertically downward) until he connected with his neighbor's workings. As soon as connection was made on the same vein, the miner was required to withdraw to within his own claim lines. The decree of 1783, also covering Spanish America, allowed additional width of claim based on the angle of dip of the vein. The extralateral right was repealed.

Sometime after Agricola and before modern times the extralateral right was abandoned in German mines. The right existed in one small area in England up to modern times in the Derbyshire lead-mining Peak District. In Australia the extralateral right existed only from 1858 to 1866 and in New Zealand from 1858 to 1877. In Canada only British Columbia had mining district regulations that might have allowed extralateral rights but these were repealed in 1897. Currently (1991) the only country that allows extralateral rights is the United States.

STATUTE LAWS

Both Dempsey and Sherwood, in their excellent 1988 papers given in England, (Bulletin of the Peak District Mines Historical Society, V.10, No.4, pp. 242-252) discuss the basis for the apex law or extralateral rights. The U.S. origin apparently stems from Nevada County, California:

"Article 2: Each prospector of a quartz claim shall hereafter be entitled to one hundred feet on a quartz ledge or vein, and the discoverer shall be allowed one hundred feet additional. Each claim shall include all the dips, angles and variations of the vein." Adopted Dec. 20, 1852.

Other mining district laws throughout the Western U.S. derive from this.

The primary item being claimed was the vein itself, not just the surface area within the mining claim boundaries; this is similar to Agricola's mention of early German practice. In Colorado the first pertinent mining law is in the territorial laws of 1874. (An Act Concerning Mines, approved February 13, 1874.) The Act is obviously modeled after the 1872 federal act and carries through, unchanged, into the state laws in 1877.

The first federal statute was passed in 1866. The secretary of the Nevada County, California, meeting, William A. Stewart, later became the U.S. senator from the State of Nevada and he was the primary author of the 1866 federal act: "... together with the right to follow such vein or lode with its dips, angles, and variations, to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition." (Act of July 26, 1866.) The 1872 federal law is the current primary statute:

"The locators of all mining locations ... shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such

surface-lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside of the vertical side-lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges. Nothing in this section shall authorize the locator or possessor of a vein or lode which extends in its downward course beyond the vertical lines of his claim to enter upon the surface of a claim owned or possessed by another." (30 US Code Sec. 26, May 10, 1872.)

Citations of case law take the following 30 pages in the current federal statute book.

PELICAN - DIVES CONTROVERSY

One of the earliest court tests of statute law occurred in Georgetown, Colorado, in the 1870's. Prof. L.E. Leyendecker gives extensive details in his Colorado Historical Society monograph (No. 1 of 1985) entitled "The Pelican - Dives Feud." John H. McMurdy, a lawyer, was developing the Dives property while Eli Streeter and Thomas McCunniff were operating the adjacent Pelican Mine. Leyendecker comments on pages 7 & 8 that "[the litigation] involved two highly productive mines - most probably located on the same silver vein on Republican Mountain" and "The apex law thus wrecked havoc in the mining community since it paved the way for untold numbers of lawsuits which benefitted only a few operators; it also led to legal forms of extortion which enriched scores of attorneys and mining experts." The Pelican - Dives Feud included the murder, on Alpine Street in Georgetown, of Jacob Snider of the Pelican Group by Jackson Bishop of the Dives group

on May 20, 1875. The litigation continued in various forms until the two mines were consolidated by William Hamill of the Dives group in 1880 and the last lawsuit against the Pelican owners was dismissed in 1884.

BUTTE

Butte, Montana, is one of the world's famous mining districts. In 1888 F. A. Heinze arrived at Butte and finally allied himself with W.A. Clark and in opposition to Marcus Daly. (Clark and Daly were the two major antagonists struggling to control the district.) Heinze, by buying mines next to major producers, then claimed a large portion of the district's ore by reason of extralateral rights. By chicanery and bribery the two major factions kept the courts busy, with Judge Clancy always deciding for Heinze. Meanwhile, underground, Heinze's miners were mining ore from between the levels of the adjacent mines. On February 13, 1905, the Amalgamated Mining Corporation bought Heinze out for \$10,500,000 to get him out of the district. Soon after, 110 lawsuits involving claims of \$70,000,000 were dismissed.

Besides Butte, the rich silver mining area around Kellogg, Idaho, was involved in apex litigation as documented in the American Institute of Mining Engineers Transactions of 1915 (Vol.LIII, pp. 555 - 562). Figure 2 of that article shows the complexity of ownership of the silver ore below the surface based on priority of filing date and the application of the apex law.

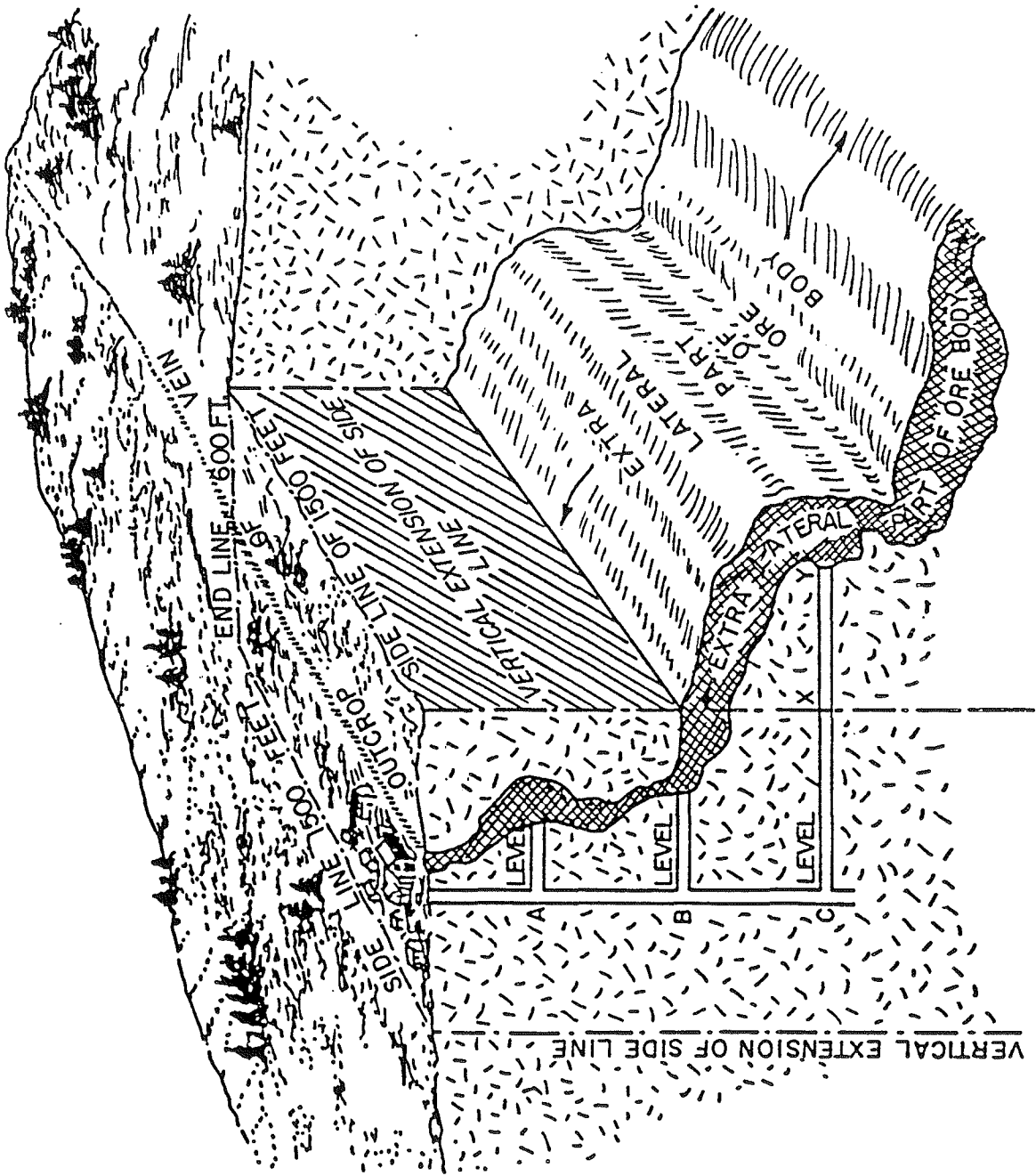
SUMMARY

The figure shown on the Wardner Vein at Kellogg, Idaho, shows the three-dimensional complexity of mining the ore in any particular subsurface area. Priority of ownership is based on the date of discovery recorded in the mining district or county clerk's records. First in time means first in right. The determination of ownership is the legal application of the apex law while the physical positioning in space is the mine

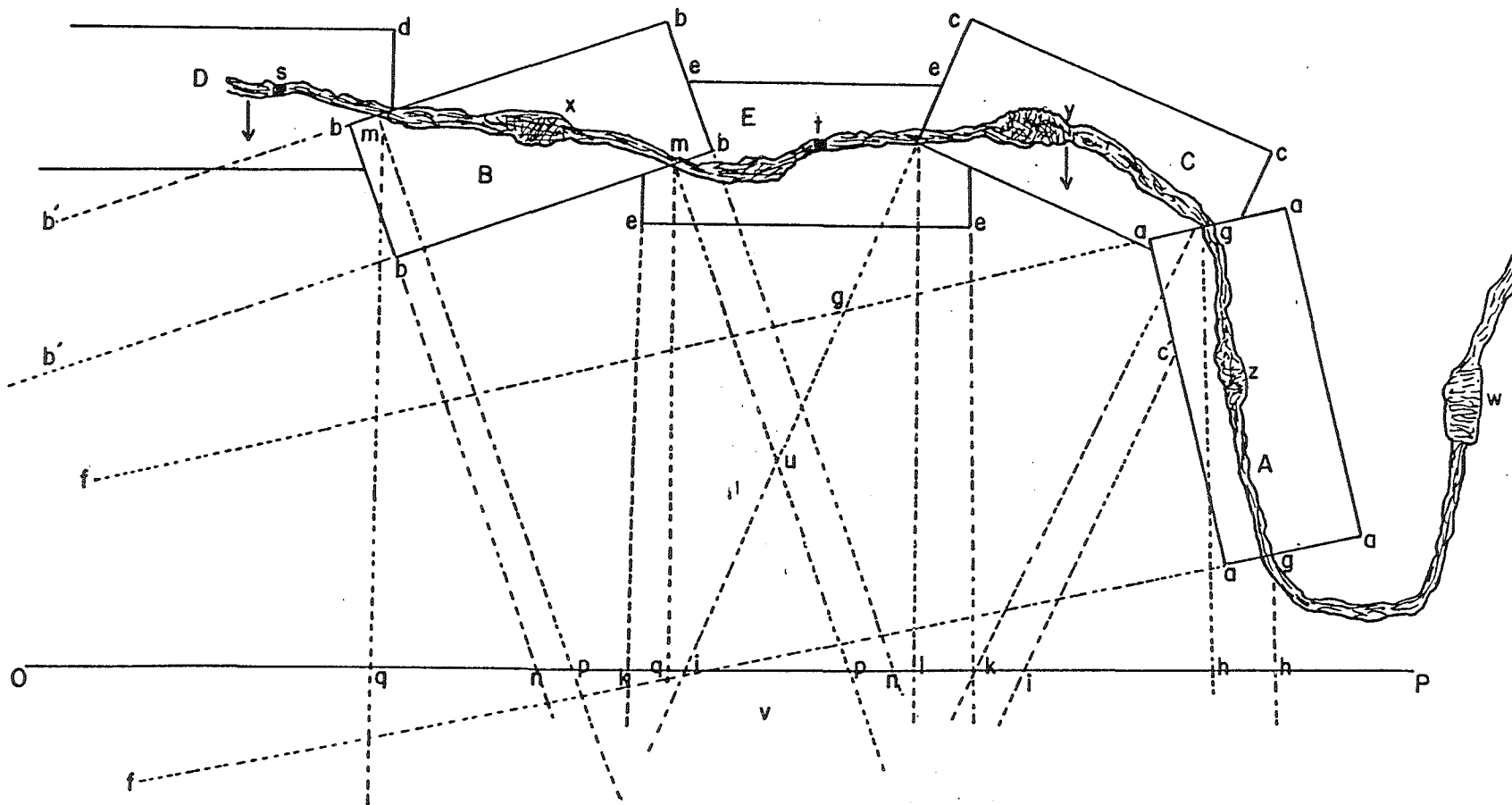
surveyor's problem of X, Y, and Z coordinates below surface. If the need arises to sink a vertical shaft deeper and then drift over to the vein under the adjoining property, the miner is technically in trespass between the vertical plane of his sideline and the vein. The miner has to acquire some sort of a right-of-way from the adjoining owner to be legally correct. It would be so much simpler for the surveyor if vertical planes through the end and sidelines were the property boundaries.

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Mining claim cutaway showing extra lateral part of orebody.



Possible extra lateral rights of overlapping claims.

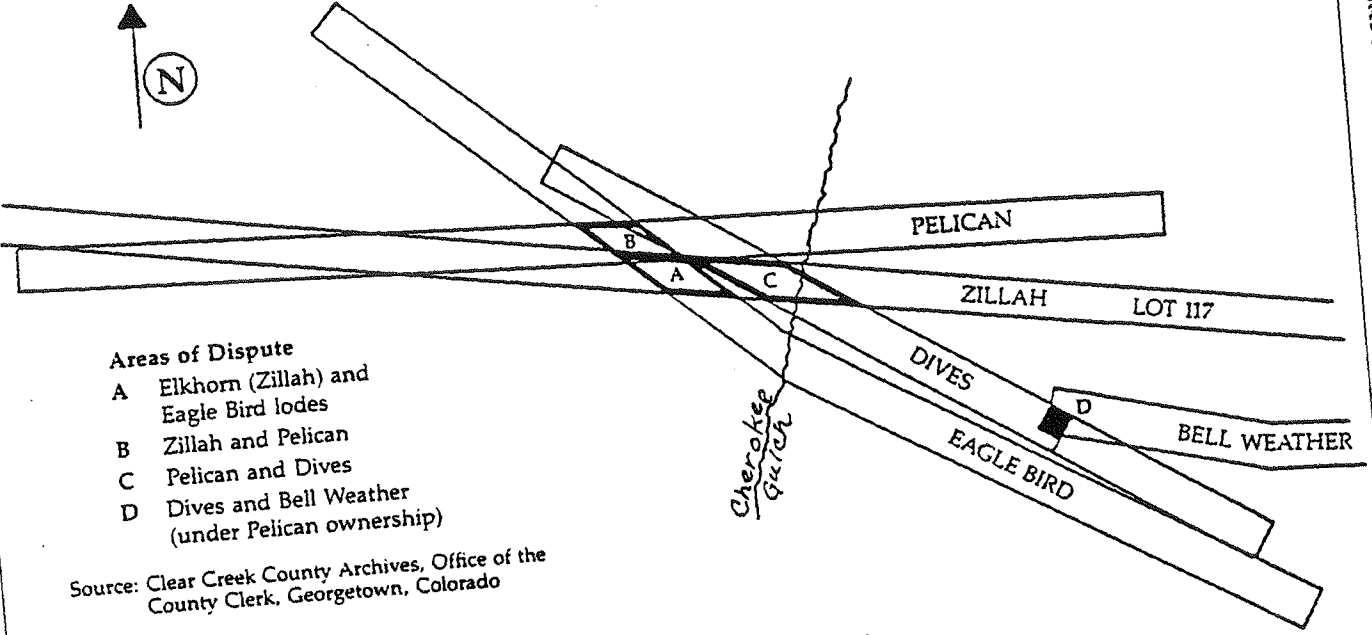


FIGURE 1. Location of Principal Lodes Discussed and Areas of Dispute

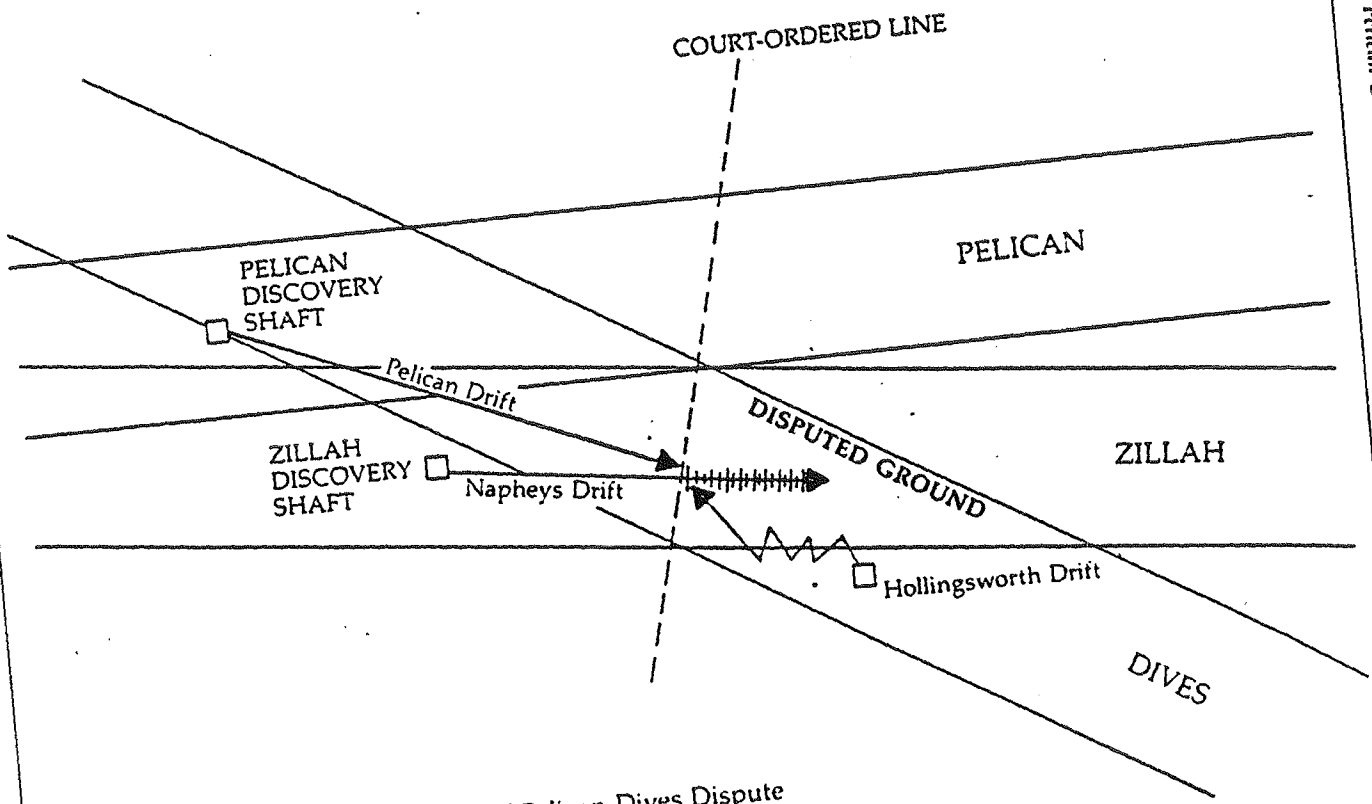


FIGURE 2. Approximate Area of Pelican-Dives Dispute and Court-Ordered Dividing Line