# *BACKSITES*

## *DAMN*

*Vaccinium ovatum*

*by*

*H. J. Newhouse*

H. J. (Howard) Newhouse surveyed in Curry county for 47 years. He was the Curry County Surveyor for 32 years. Howard passed away in August, 2000. Howard's father, S. O. Newhouse, was also Curry County Surveyor for many years. Howard's little booklet "***Backsites***" does not show a copyright and I was unable to contact his wife or son for permission to copy. It is my hope that putting this on line will be taken as a tribute to the many years of work Howard contributed to the success of Curry County and all who read it will enjoy his effort.

Howard also wrote a 200+ page book called **Rogue River Rogue** which was dedicated to the Curry County Historical Society. This book was copyrighted and contains an enjoyable collection of his memories of growing up, living and working in Curry County.

This little booklet was an enjoyable read for me and I hope you also enjoy it.

Reily Smith
Curry County Surveyor

# BACKSITES

## Introduction

If it's not in writing it's never been said.

What does a surveyor on the coastal slopes of Southwestern Oregon think of during a winter day when the rain and hail are trickling down his neck and backbone and on into his caulk boots and he can see at eye level just enough over the huckleberry brush to remember that the gas for his empty chainsaw is somewhere way back near the transit (of course)?

He remembers just that day in July when the temperature was over 90 degrees in the shade and he was standing in the hot sun at eye level with a whole hillside of hazel brush, intertwined with poison oak, and the chainsaw tool for his saw is way back near the transit where it cannot help the obvious fact that the chain has jumped.

starting corner was located and the survey commenced. The axemen had no problem keeping warm but after an hour or so I was freezing.

The line soon proceeded directly into a ten foot high, four foot diameter cedar stump, the year of its demise more or less indicated by the spring board holes. After thoughtful examination, my father with the assistance of the crew, managed to ascend the obstacle, set up the transit and proceed. In due time the next stake was set ahead, the crew then returned, assisted my father to descend and I was called forward. From the vantage point of a rear flagman a mere stump gave me no concern. I plodded up to it with no particular thought whatsoever.

On arrival my stump of no concern took on new value. At first sight it appeared to look more like 20 feet in height, not ten. Second, it didn't have any bark and the sides were like polished glass. There were only two spring board holes and they were on opposite sides of the trunk. No help for me. On observation I had no question that the top of the stump was four feet in diameter, but the base for my ascent was more like seven feet. I didn't have paws or claws so I had no way but to give the stump a bear hug and climb. By now time had passed, silence was Golden. I could hear no axe work and the "Where the hell are you", was in the air.

The double bit falling axe proved my salvation. I felled a small fir, eight feet in length and four inches in diameter. I limbed it down, leaving the side branches extending from the main trunk six inches or more and produced a sufficient ladder to climb to my buzzard's roost. The backsite was accomplished, the woods reverted to the crash of the axeman, and I never looked behind, until called ahead. My ladder was by now a fallen fir for the second time. My access to the ground was by jumping into a healthy sword fern bush. The landing was good but the oak handle of the falling axe managed to fall on the gallon glass jug of water.

About 10:30 a.m. I was in the bottom of a salmon berry side draw. The little creek was not frozen but it had ice on the banks. The axemen were out of sight over the ridge ahead and I could just see my father's head on the brim. Pretty soon I saw his head disappear. I stomped my feet,



swung my arms, and probably did everything an Indian would do in a war dance just to keep warm. I continued to look ahead, look at my Ingersoll watch every so often, and watched 11 a.m. disappear as well as 12 noon and 1 p.m.

Somewhere around 2 p.m. my father's head appeared over the brim and said "Come ahead". Running up the hill did improve my circulation and help thaw out my peanut butter sandwich. I was curious enough this time to find out why the heck I got left in the deep freeze with the salmon berry. My father was kind enough to explain. The head axeman had made a bad pass on a vine maple limb and nearly severed his ear. My father and crew tied the ear back on his head with their bandanas, hoofed it out to the Oldsmobile, drove to Gold Beach, searched out the only doctor in the county, ate their lunch while the doctor stitched up the ear and returned to the job.

The head axeman came back injury and all. He was being paid four dollars a day and he sure wasn't going to lose that. Of course I just happened to get lost in the crisis. I did stay with my salmon berries and never came ahead until called.

We worked late that day so everyone would get in most of their eight hours and about 6 p.m. we walked out about a quarter of a mile to the County Road. We put all the gear in the trunk of the vehicle except my plumb bob. I'd left it on the last setup while eating my peanut butter sandwich. Since a plumb bob was worth three days' wages I convinced the rest of the crew to wait until I could retrieve the little brass brute. God, was I glad to get home.

Ex Libris
George Fairbanks

A

# TREATISE

OF

# Practical Surveying;

WHICH IS DEMONSTRATED

FROM ITS FIRST PRINCIPLES.

WHEREIN

EVERY THING THAT IS USEFUL AND CURIOUS IN THAT ART, IS FULLY CONSIDERED AND EXPLAINED.

PARTICULARLY

THREE NEW AND VERY CONCISE METHODS FOR DETERMINING THE AREAS OF RIGHT-LINED FIGURES ARITHMETICALLY, OR BY CALCULATION, AS WELL AS THE GEOMETRICAL ONES HERETOFORE TREATED OF.

The whole illuſtrated with Copper-Plates.

THE SIXTH EDITION.

By *ROBERT GIBSON*, TEACHER *of the* MATHEMATICS.

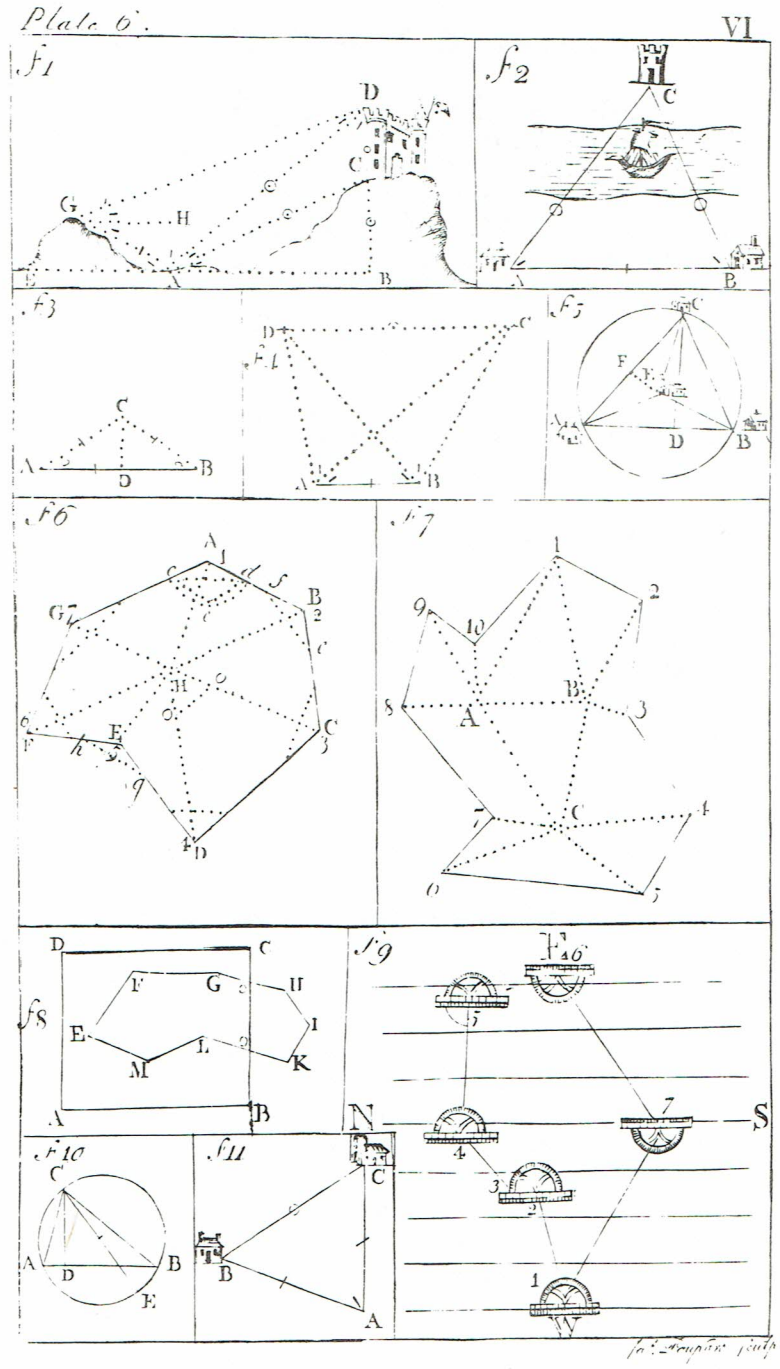
WITH ALTERATIONS AND AMENDMENTS, ADAPTED TO THE USE OF AMERICAN SURVEYORS.

*PHILADELPHIA:*

PRINTED BY *JOSEPH CRUKSHANK*, No. 87, HIGH-STREET, 1792.







66)217.75(3. 29 of four-pole chains, or

197

Ch. L.

65 6. 29 of two-pole chains.

61

## *How to take a Survey by the* CHAIN *only.*

### *PROB.* I.

To ſurvey a piece of ground, by going round it, and the method of taking the angles of the field, by the chain only.

Plate VI. fig. 6.

Let ABCDEFG be a piece of ground to be ſurveyed: beginning at the point A, let one chain be laid in a direct line from A towards G, where let a peg be left, as at *c*; and again, the like diſtance from A in a direct line towards B, where another peg is alſo to be left, as at *d*: let the diſtance from *d* to *c* be meaſured, and placed in the field-book, in the ſecond column under the denomination of angles, in a line with ſtation No. 1; and in the ſame line under the title of diſtances, in the third column, let the meaſure of the line AB in chains and links be inſerted. Being now arrived at B, let one chain be laid in a direct line from B towards A, where let a peg be left, at *f*, and





and again, the like diſtance from B in a direct line towards C, where let alſo another peg be left, as at *e*; the diſtance from *e* to *f* is to be inſerted in the field-book, in the ſecond column, under angles, in a line with ſtation No. 2; and in the ſame line, under the title of diſtances in the third column, let the meaſure of the line BC, in chains and links, be inſerted: after the ſame manner we may proceed from C to D, and thence to E; but becauſe the angle at E, *viz.* FED, is an external angle, after having laid one chain from E to *h*, and to *g*, the diſtance from *g* to *h* is meaſured, and inſerted in the column of angles, in a line with ſtation No. 5. and on the ſide of the field-book againſt that ſtation, we make an aſteriſk, thus *, or any other mark, to ſignify that to be an external angle, or one meaſured out of the ground. Proceed we then as before, from E to F, to G, and thence to A, meaſuring the angles and diſtances, and placing them as before, in the field-book. oppoſite to their reſpective ſtations; ſo will the field-book be completed in manner following.

*N. B.* After this manner the angles for inacceſſible diſtances may be taken, and the method of conſtructing or laying them down, as well as the conſtruction of the map, from the following field-notes, muſt be obvious from the method of taking them.

The form of the field-book, with the title.

A field-book of part of the land of Grange, in the pariſh of Portmarnock, barony of Coolock, and county of Dublin; being part of the eſtate of L. P. eſq; let to C. D. farmer. Surveyed January, 30, 1788.

Taken

Taken by a four-pole chain.

| Remarks. | No. Sta. | Angles. Ch. L. | Diſtances. Ch. L. |
|---|---|---|---|
| Mr. J. D's part of Grange | 1 | 1.80 | 17.65 |
| | 2 | 1.79 | 18.50 |
| Mr. L. P's part of Portmarnock | 3 | 1.76 | 28.00 |
| ſtrand | 4 | 1.41½ | 20.00 |
| * | 5 | 1.87½ | 14.83 |
| Widow J. G's part of Grange | 6 | 1.14 | 19.41 |
| | 7 | 1.89 | 24.53 |
| | Cloſe at the firſt ſtation. | | |

The ſignification of the remarks.

Mr. J. D's part of Grange bounds, or is adjacent to the ſurveyed land from the firſt to the third ſtation: Mr. L. P's part of Portmarnock bounds it from the third to the fourth ſtation; the ſtrand then is the boundary from thence to the ſixth, and from the ſixth to the firſt ſtation, the widow J. G's part of Grange is the boundary.

It is abſolutely neceſſary to inſert the perſons names, and town-lands, ſtrands, rivers, bogs, rivulets, *&c.* which bound or circumſcribe the land which is ſurveyed, for theſe muſt be expreſſed in the map.

In a ſurvey of a town-land, or eſtate, it is ſufficient to mention only the circumjacent town-lands, without the occupiers names; but when a part only of a town-land is ſurveyed, then it is neceſſary to inſert the perſon or perſons names, who





who hold any particular parcel or parcels of ſuch town-land, as bound the parts ſurveyed.

When an angle is very obtuſe, as moſt in our preſent figure are, *viz.* the angles at A, B, C, E, and G; it will be beſt to lay a chain from the angular point as at A, on each of the containing ſides to *c* and to *d*; and any where nearly in the middle of the angle as at *e*: meaſuring the diſtances *ce* and *ed*; and theſe may be placed for the angle in the field-book. Thus,

| No. Sta. | Angle. Ch. L. | Diſt. Ch. L. |
|---|---|---|
| 1 | 1.03<br>1.09 | 17.65 |

For when an angle is very obtuſe, the chord line, as *cd*, will be nearly equal to the radii *Ac* and *Ad*; ſo if the arc *ced* be ſwept, and the chord line *cd* be laid on it, it will be difficult to determine exactly that point in the arc where *ed* cuts it: but if the angle be taken in two parts, as *ce* and *ed*; ſuch chords may with ſafety be laid on the arc, and the angle thence may be truly determined and conſtructed.

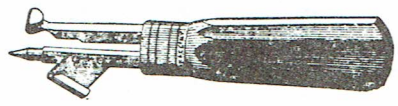
After the ſame manner any piece of ground may be ſurveyed by a two-pole chain.

We had some fun one summer in 1957 surveying at Illahe up Rogue river. I will admit it was 90 percent brush cutting and 100 degrees plus warm. Sweat was the order of the day and we adopted a new expletive emphatically pronounced - "Huckleberry".

Huckleberry was the primary undergrowth in this mountainous timbered area where we worked and was a vast sea of intertwined vegetation which seemed to be placed by Mother Nature to hinder as much as possible the forward progress of man in his conquest to remove the mighty Douglas fir for market.

Our well sharpened brush hooks, although swung with vicious aim, would bounce back time after time in frustrating tangents from our small green-leafed barrier. Huckleberry was soon adopted as a curse word but the bush never seemed to take offense and the good Father never made us say any extra "Hail Mary's".

TIMBER SCRIBE.



We were to work for Archie Boyd, landowner and Wes Morgan, sawmill man. Our job was to cut boundary lines for timber logging and most of our lines were against the U. S. Forest Service which required at least casual care.

Morgan's mill cut principally railroad ties and he shipped them north by truck over Eden ridge to the railhead at Powers, a distance of about 24 miles. On wet weather days when he had a truck load for Powers it took a D6 cat to help the truck with the adverse and around the unnumbered switchbacks to the top of Eden ridge. From the top of Eden ridge the truck could almost coast to Powers. As you see, rainy days weren't really productive from the transportation viewpoint.

If there were 6 inches of snow or better matters became less productive and sometimes came to a roaring halt. The night before we left home base at Wedderburn we loaded our vast equipment in a second-hand four-wheel drive Jeep pickup. It had four cylinders and would actually make 40 miles an hour on a truly horizontal surface.



We took two brush hooks, two 8 inch mill bastard files, 200 foot band chain with splices, Mahn transit made sometime after 1900 (It would double perfect to four minutes), caulk boots, sleeping bags, Fels Naptha soap for poison oak, some clothes, a case of beer and some groceries supposed to last around six days. Most of this stuff was put in cardboard boxes and tied securely with binding twine.

Now there was no road up either the south side or north side of the Rogue river to Agness, a distance of 26 miles. From Agness to Illahe, which was our destination, there is a county road.

The distance between the two names is about 7 miles, so if you were going to drive to Illahe you generally followed this route: Wedderburn north to Port Orford (27 miles), Port Orford north to Bandon (30 miles), Bandon easterly up the Coquille river to Coquille (18 miles), Coquille southerly to Norway (6 miles), Norway southerly to Myrtle Point (3 miles), on up the South Fork of the Coquille river 6 miles to Broadbent, Broadbent southerly to Gaylord (7 miles), Gaylord southerly to that outpost of civilization Powers (8 miles). We now leave the hard surface road and wind our way in a southerly direction 11 miles to China Flat. Here we commence to climb to the top of Eden ridge (8 miles). From the top of Eden ridge we wind our way southerly down the countless switchbacks 5 miles to Illahe. Our little excursion has covered something like 129 miles.

At Illahe we drive down to the Foster Creek boat landing which is just a piece of flat bedrock running out into the Rogue river. It has been known as a landing and river crossing since the arrival of the first white man. Here we meet our bosses and gracefully go through the unnecessary formalities up to about ankle deep.

After that we holler our fool heads off trying to raise the caretaker at the Jergins ranch across the river. He has the only boat for our intended river crossing. Whether the motor will run is debated. After some minutes and numerous familiar adjectives he appears, gives us half the peace sign and heads over.

We had too many chiefs and too much baggage for one load. So the three chiefs go over first so the proper start-

ing monuments can be identified. Self appointed Number One Chief Boyd immediately after landing proceeds directly to a local monument which he calls the "two bit apple tree". The tree is precariously located on the high bank of the Rogue river. He informs us that he knows by sworn oath by someone whose name he can't recall that this tree is on the East-West boundary of the tract we are to survey.

We are then led east over open ground to a rusty one and one-half inch iron pipe which Chief Boyd says was set by a previous County Surveyor and all known surveys in this area have used this corner without question.

Many "Oh's" and "Ah's" are now made as our magic instrument arrives on the scene. It is assembled and centered with precise accuracy over this most holy of holy monuments. We drop the magnetic needle and backsite the "two bit apple tree" which is about as east and west as backsighting on the moving mail truck across the river. With finesse we consult our maps with our chiefs who vent their theories on the inconsistency of young inexperienced surveyors.

After the sun settles west behind the nearby hills and the temperature cools we convince our chiefs that the rusty pipe is way too close to the river, indicated by reference to the Government Fieldnotes, and that the true corner is a mound of stone four feet at the base built as a pyramid with the top being a brass cap brazed to a three inch galvanized iron pipe with four large fir trees marked in the proper manner as outlined by the Surveyor General and facing the corner. We attempt to explain that certain marks were stamped into the brass cap by a personal representative of the Great White Father and tell what corner it really represents.

From our location where our discussion is taking place we advise our chiefs to allow us to proceed ¼ mile south to a point behind a large storage barn. Our chiefs vent their wrath upon God and surveyors and we proceed to chain south into a dense mass of huckleberry, azalea, and rhododendron. Our corner is found without difficulty and our chiefs are found without words.

It is late, we bid our chiefs good evening and they depart with gestures while commenting to each other on



how they had known and been to the Great White Father's starting point many times.

The crew and myself must now proceed to camp. For transportation our boat pilot has something called a World War II jeep. It functions very well on 3 cylinders and has the same number of fenders. We abandon our transit, chain, and brush hooks to the watchful care of the bear, deer, and squirrels and proceed on our way to camp.

We drive south down a trace of tracks and find camp. Life turns out to be a bowl of cherries. Camp turns out to be Claude Barton's old fishing resort. Besides an adequate kitchen with wood stove, we have running water, pantry, large living room complete with mounted deer horns, bear rug, fireplace, and modern library with novels copyrighted as late as 1931.

To add to our pleasure, we have inside plumbing, a sleeping porch, beds and mattresses for 27 people plus a gramophone with at least two Caruso recordings. Our lighting is all by kerosene Aladdin lamps. After a beer or two we decide we are in a colossal one story firetrap. We also decide not to sleep in the same bed two nights in a row and most likely next to open windows. Dinner music and food was enough to put us at ease and we reluctantly took to bed at 8:30 p.m.

Morning was always beautiful, the early sunshine, the roar of the river, deer in the yard, and the thought of breakfast. Now this meal was the one each member had to himself. The diet varied individually, day to day. Eggs any old way, bacon, sauerkraut, dill pickles, sidehill salmon liver, wieners, spuds, gravy, cabbage (boiled or fried), chili, tossed salad with lettuce and tomatoes, canned fruit, catsup, burned toast, jelly, and coffee first and last.

Lunch was a lead pipe cinch, one can of Vienna sausages and a small can of fruit accompanied with a group prayer for a creek crossing at lunch.

For big evening meals we threw in canned beef, spuds, turnips, onions, carrots and rutabagas in a pot for a mulligan. Other evenings spaghetti and meatballs with tossed salad were easy after a long hike in. Sidehill salmon and spuds filled in the rest of the gap and, believe it or not, our caretaker invited us down for dinner one night.

His sole occupation was to recover from a bad back. He always stayed under a walnut tree with a can of beer and two or three times a day turned the sprinklers on and off while his wife mowed somewhere around three acres of grass a week, took care of two log cabins, carried supplies up from the boat, put diesel in the generator, split wood, and weeded an acre of garden.

He got lonesome one night and let the gal off early so she could fix dinner for the poor hard working surveyors. After dinner we played pinochle til 11 p.m. while she did dishes.

Our surveying end of the deal could be out-lied by endless practitioners of the trade and I don't think it necessary to delve into it in great detail. The east line of the claim went up and down slopes to 37°, crossed the usual side creeks and cliffs. All these helped add adjectives to those adjectives we had already added to our favorite, "Huckleberry".

We found all our controlling corners on the east. On the south line we had to cross Rogue river for the anchor corner. We arrived at the left bank about noon. We had plenty of water to drink after our slide down the rocks, huckleberry, oak and vinemaple.

We peeled a reasonably straight willow pole and made a stadia rod, marked every foot and half foot, the same being about seven feet tall. We plumbed this on top of a large boulder, on line, with a mound of stone at base.

Our lunch consisted of the remaining bread which was now a lump of dough, three leaking spheroids called oranges, and two cans of a product called potted meat product. We attempted to rebake the bread on a nearby rock at about 110° F., opened our meat product, which gave off a very strong odor of formaldehyde. We decided to feed the fish. We had no boat for our river crossing so we walked the hot rocks about a mile upstream to where our fearless boat pilot resided under the walnut tree.

The downriver rapids are too much for our boat pilot so he takes us across to our reliable red jeep. We then drive downstream to a point opposite our sturdy stadia pole. We lined up and for good measure we triangulate. They agree within a half foot or so, and on west we go. Now the vegetation changed slightly.



There was much less fir and a previous four year snow storm had broken down all the old growth tan oak (10 to 36 inch diameter). The trees had fallen crisscross and huckleberry had grown in between. Dead tan oak is like cutting barbed wire with a butter knife. Walking out on wind-fallen tan oak is for tightrope performers with jack hammers.

We left the road at 1:15 p.m. and at 2:15 p.m. we had advanced 135 feet. The crew looked at me and I looked at them. Back to the red ghost, back to the boat landing, back to the shouting, back across the river, and back to the beer.

The surveying, however, was now working in our favor. It was less steep and quitting time usually put us near a trail leading to the cabin. We finished cutting all the boundaries. Saturday before noon we decided as a precaution to close our traverse and went back by way of road to the Great White Father's monument. We closed in good shape.

It being too late to leave for home, we stayed one more night and packed the next morning. It was raining. Across the river, we packed the Red Chariot, chugged up to the first switchback and stopped. We backed down, put it in four wheel and gained 10 feet over the first try.

We lifted the hood, which always means bad news. We put the hood down, drove another 75 feet and stopped. Through the smell of gas we traced from the carburetor the copper gas line to the gas tank. Sure enough the copper line had rubbed against the frame for so long it filed a leak into the copper pipe. No way to a garage, no copper pipe, no friction tape, so we go to the Band Aide box. By the time we are done we are all wet but on the way.

Now being low on gas we coast as much as possible from the top of Eden ridge towards Powers. On arrival we find the only Sunday function in Powers is the local tavern. We make the grand tour around town for service but to no avail. We make it around one more block and find two young gentlemen tearing down a motor in a garage. With sufficient long green we obtain gas. This of course ruins our funds to fill our abdominal cavities.

It was raining again. We voted to take the private Coos

Bay lumber road down the Sixes river. The gates were open and this shortened our route home and to dinner. We clattered along fine for 10 or 11 miles and on the incline into Eckley the Red Comet started to slow and steer to the left. Four wheel only made it worse.

We stop, we observe, we converse, we conclude we have a flat tire. Our spare is under the survey gear. All material must be removed. A fine search of the pickup bed results in no jack. A greater light flashes before our eyes and we tip the front seat forward and lo and behold, both jack and wrench appear.

We change our tire in the gentle downpour just before the flashlight fails. The gear is hastily loaded back into the bed of the truck by the blind. We continue to within about eight miles of the junction of the Sixes River road with Oregon Coast Highway 101 where we can at last head south to home.

But we are not yet ready for such a celebration because before us lies a deep and murky pool of water. We proceed through this menace and on to the opposite rise to the top of the incline and our valiant power source again fails.

Having used all of our explicatives, both old and new, we make a new examination, only to find our distributor cap and points are mighty wet. Handkerchiefs for drying are to no avail. The battery is about to surrender. As a last resort we heat the whole thing up with a large kitchen match, replace quickly, the engine turns over one more time and we proceed. We hit the intersection and head south on good old 101 at 40 miles per hour, give or take. We rejoice over our accomplishments and conquering of adversities.

Alas, one mile from the home base while enjoying the warmth of the heater our lights go out. This was solved quickly, because the gentleman riding in the center had gone to sleep, slid forward and his knee had pushed the light switch in and off. Within minutes Winken, Blinken, and Nod had taken over for the remainder of the day.



INSTRUCTIONS

TO THE

# SURVEYORS GENERAL OF PUBLIC LANDS

OF

**THE UNITED STATES,**

FOR THOSE

SURVEYING DISTRICTS ESTABLISHED IN AND SINCE THE YEAR 1850;

CONTAINING, ALSO,

A MANUAL OF INSTRUCTIONS

TO

REGULATE THE FIELD OPERATIONS OF DEPUTY SURVEYORS,

**ILLUSTRATED BY DIAGRAMS.**

---

PRESCRIBED, ACCORDING TO LAW, BY THE PRINCIPAL CLERK OF SURVEYS, PURSUANT TO ORDER OF THE COMMISSIONER OF THE GENERAL LAND OFFICE.

---

WASHINGTON:
A. O. P. NICHOLSON, PUBLIC PRINTER.
1855.

NOTCHING CORNER POSTS.

Township corner posts, common to four townships, are to be notched with *six* notches on each of the four angles of the squared part set to the cardinal points.

All mile posts *on township lines* must have as many notches on them, on two opposite *angles* thereof, as they are miles distant from the township corners, respectively. Each of the posts at the corners of sections in the *interior* of a township must indicate, by a number of notches on each of its four corners directed to the cardinal points, the corresponding number of miles that it stands from the *outlines* of the township. The four sides of the post will indicate the number of the section they respectively *face*. Should a tree be found at the place of any corner, it will be marked and notched as aforesaid, and answer for the corner in lieu of a post, the kind of tree and its diameter being given in the field notes.

BEARING TREES.

The position of all corner posts, or corner trees, of whatever description, that may be established, is to be evidenced in the following manner, viz: From such post or tree the courses must be taken and the distances measured to two or more adjacent trees in opposite directions, as nearly as may be, and these are called "bearing trees." Such are to be distinguished by a large *smooth blaze*, with a *notch* at its lower end, facing the corner, and in the blaze is to be marked the number of the *range*, *township*, and *section;* but at quarter section corners nothing but ¼ S. need be marked. The letters B. T. (bearing tree) are also to be marked upon a smaller blaze directly under the large one, and as near the ground as practicable.

At all township corners, and at all section corners, on range or township lines, *four* bearing trees are to be marked in this manner, one in each of the adjoining sections.

At interior section corners *four* trees, one to stand within each of the four sections to which such corner is common, are to be marked in manner aforesaid, if such be found.

A tree supplying the place of a corner post is to be marked in the manner directed for posts; but if such tree should be a beech, or other *smooth bark* tree, the marks may be made on the *bark*, and the tree notched.

From quarter section and meander corners two bearing trees are to be marked, one within each of the adjoining sections.





Where the requisite number of "bearing trees" is not to be found at convenient and suitable distances, such as are found are to be marked as herein directed; but in all such cases of deficiency in the number of bearing trees, (unless, indeed, the boundary itself be *a tree,*) a *quadrangular trench*, with sides of *five* feet, and with the angles to the cardinal points, must be spaded up outside the corner, as a centre, and the earth carefully thrown on the inside, so as to form a range of earth, which will become covered with grass, and present a small square elevation, which in aftertime will serve to mark, unmistakably, the spot of the corner.

CORNER STONES.

Where it is deemed best to use STONES for boundaries, in lieu of posts, you may, at *any* corner, insert endwise into the ground, to the depth of 7 or 8 inches, a stone, the number of cubic inches in which shall not be less than the number contained in a stone 14 inches long, 12 inches wide, and 3 inches thick—equal to 504 cubic inches—the edges of which must be set north and south, on north and south lines, and east and west, on east and west lines; the dimensions of each stone to be given in the field notes at the time of establishing the corner. The kind of stone should also be stated.

MARKING CORNER STONES.

Stones at township corners, common to four townships, must have *six* notches, cut with a pick or chisel on each edge or side towards the cardinal points; and where used as section corners on the range and township lines, or as section corners in the interior of a township, they will also be notched, to correspond with the directions given for notching posts similarly situated.

Posts or stones at township corners on the base and standard lines, and which are common to two townships on the north side thereof, will have *six* notches on each of the *west*, *north*, and *east* sides or edges; and where such stones or posts are set for corners to two townships *south* of the base or standard, *six* notches will be cut on each of the west, *south*, and east sides or edges.

Stones, when used for quarter section corners, will have ¼ cut on them—on the west side on north and south lines, and on the north side on east and west lines.

MOUNDS.

Whenever bearing trees are not found, mounds of earth, or stone, are to be raised *around posts* on which the corners are to be marked in the manner aforesaid. Wherever a mound of earth is adopted, the same will present a conical shape; but at its base, on the earth's surface, a *quadrangular trench* will be dug; by the "trench" (here meant) is to be understood a *spade deep* of earth thrown up from the four sides of the line, *outside* the trench, so as to form a *continuous elevation along its outer edge*. In mounds of earth, common to *four* townships or to *four* sections, they will present the *angles* of the quadrangular trench (*diagonally*) towards the cardinal points. In mounds, common only to *two* townships or *two* sections, the *sides* of the quadrangular trench will *face* the cardinal points. The sides of the quadrangular trench at the base of a township mound are to be *six* feet, the height of mound *three* feet.

At section, quarter section, and meander corners, the sides of the quadrangular trench at base of mounds are to be *five* feet, and the conical height *two and a half feet*.

Prior to piling up the earth to construct a mound, there is to be dug a spadefull or two of earth from the corner boundary point, and in the cavity so formed is to be deposited a *marked stone*, or a portion of *charcoal*, (the quantity whereof is to be noted in the field book;) or in lieu of charcoal or marked stone, a *charred stake* is to be driven twelve inches down into such centre point: either of those will be a *witness* for the future, and whichever is adopted, the fact is to be noted in the field book.

When mounds are formed of *earth*, the spot from which the earth is taken is called the "*pit*," the centre of which ought to be, wherever practicable, at a uniform distance and in a uniform direction from the centre of the mound. There is to be a "pit" on *each* side of every mound, distant eighteen inches outside of the trench. The trench may be expected hereafter to be covered by tufts of grass, and thus to indicate the place of the mound, when the mound itself may have become obliterated by time or accident.

At meander corners the "pit" is to be directly on the line, *eight links* further from the water than the mound. Wherever necessity is found for deviating from these rules in respect to the "pits," the course and distance to each is to be stated in the field books.

Perpetuity in the mound is a great desideratum. In forming it with light alluvial soil the surveyor may find it necessary to make due allowance for the future settling of the earth, and thus making the mound





more elevated than would be necessary in a more compact and tenacious soil, and increasing the base of it. In so doing, the relative proportions between the township mound and other mounds is to be preserved as nearly as may be.

The earth is to be pressed down with the shovel during the process of piling it up. Mounds are to be *covered* with sod, grass side up, where sod is to be had: but, in forming a mound, *sod* is NEVER to be *wrought up* with the earth, because sod decays, and in the process of decomposing it will cause the mound to become porous, and therefore liable to premature destruction.

POSTS IN MOUNDS

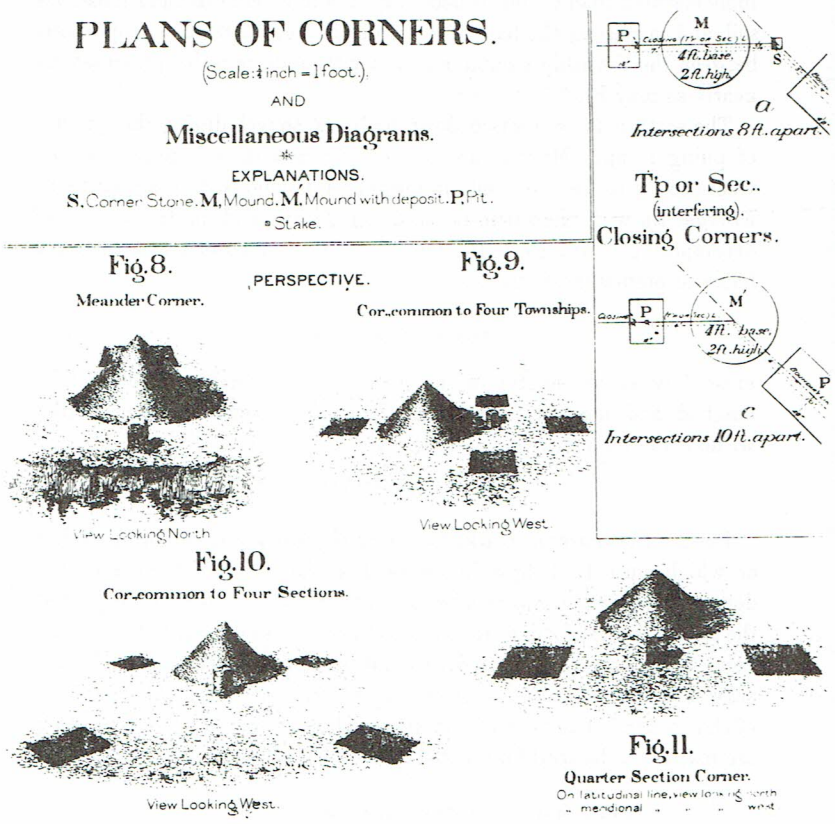
must show above the top of the mound ten or twelve inches, and be notched and marked precisely as they would be for the same corner without the mound.

MOUND MEMORIALS.

Besides the *charcoal*, marked *stone* or *charred stake*, one or the other of which must be lodged in the earth at the point of the corner, the deputy surveyor is recommended to plant *midway* between each pit and the trench, seeds of some tree, (those of fruit trees adapted to the climate being always to be preferred,) so that, in course of time, should such take root, a small clump of trees may possibly hereafter note the place of the corner. The facts of planting such seed, and the kind thereof, are matters to be truthfully noted in the field book.

WITNESS MOUNDS TO TOWNSHIP OR SECTION CORNERS.

If a township or section corner, in a situation where bearing or witness trees are not found within a reasonable distance therefrom, shall fall within a ravine, or in any other situation where the nature of the ground, or the circumstances of its locality, shall be such as may prevent, or prove unfavorable to, the erection of a mound, you will perpetuate such corner by selecting in the immediate vicinity thereof a suitable plot of ground as a site for a bearing or *witness mound*, and erect thereon a mound of earth in the same manner and conditioned in every respect, with *charcoal*, *stone*, or *charred stake* deposited beneath, as before directed; and measure and state in your field book the distance and course from the position of the true corner of the bearing or witness mound so placed and erected.








We had a call one evening in October of 1960 from Bill up Elk River. He had sold a small tract on the river and needed our attention. We arranged a date, arrived at the proper time, introduced ourselves and proceeded to the project.

The total ranch had once been surveyed about 1933 and the point of beginning of everything was a large twin rock 50 feet high on the north side of the Elk River and supposedly related to the north - south range line. It was supposed to have a large "X" carved on the west face of the west rock.

The river was shallow so we waded over to the twin rocks which were quite obvious. We then had to pull off a half acre of poison oak before we found our desired "X". It was easily identifiable, as the cross measured about one foot and was well drilled into the west face. We dropped the old needle and headed south.

About 1000 feet away we pass a rusty old U. S. Forest Boundary sign nailed to a tree about two feet east of the line on top of a 100 foot cliff overlooking Elk River. Now having satisfactorily, beyond doubt, established our basis of survey we set corner Number "1" and proceed to cut out a seven sided tract in somewhat circular form to the east, northeast, north, and northwest and so on back to the range line.

In this traverse it is emphasized by Bill to stay close to the vegetation line (willow and blackberry) and not occupy any of the open gravel bar. Bill's purpose for this is to be assured that his sons, daughters, grandsons, and granddaughters, etc. would always have the right to travel the gravel bars for rock throwing and fishing expeditions.

Of course there is no provision for access to the tract because Bill says all of his neighbors are friends. So be it. In March of 1961 we are again called by Bill for a repeat performance in our profound technique related to surveying.

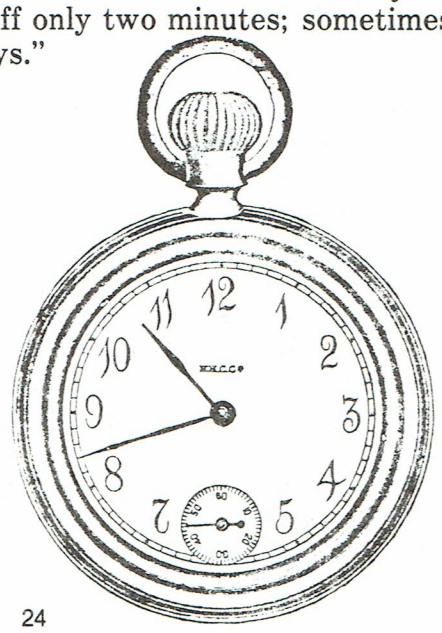
It was a warm sunny Monday morning and Bill wanted to stop on the way up to the job and check on his brother Huey. Huey had a strong liking for the juice of the grape

and Mondays weren't always his best days. We stopped at his house which had a tar paper roof, board and bat siding (without the bats), a horizontal gas barrel on legs for a stove and a table of sorts with dynamite boxes for chairs.

He had a pretty good bottle collection mixed with the bean cans in one corner but unfortunately none of the bottles were antique. Bill told Huey he might as well come along with us, so he rolled up a shaky Prince Albert do-it-yourself and got in the jeep with the rest of us. We rolled the windows down.

As the new survey pertained to our previous one we had to relocate our old corners. We couldn't find Number 7. We found Number 6, couldn't find Numbers 5, 4 and 3. We found Number 2 but not Number 1. So I said, "What the hell, we'll set up on Number 2, drop the old needle and run the courses and distances back to Number 6." We can then judge how far to rotate the bearings right or left by how far we miss Number 6.

Around the horn we went until we finally reach good old Number 6. Huey was sitting on a rotten log waiting for us. As it turned out the Gods of Fate were with us and we nearly centered right on Number 6. I turned to my head-chainman and said, "Lee, the distance is good and we are only off two minutes." Huey took a drag off Prince Albert, turned to brother Bill and remarked: "These surveyors are damn good. They're off only two minutes; sometimes I'm off three or four days."





# ELEMENTS

OF

# SURVEYING

AND

# LEVELLING;

WITH

DESCRIPTIONS OF THE INSTRUMENTS AND THE NECESSARY TABLES.

By CHARLES DAVIES, LL. D.,

AUTHOR OF A FULL COURSE OF MATHEMATICS.

A. S. BARNES & COMPANY,
NEW YORK AND CHICAGO.
1874.

## To find the true Meridian with the Compass.

**122.** 1. Drive two posts firmly into the ground, in a line nearly east and west; the uppermost ends, after the posts are driven, being about three feet above the surface, and the posts about four feet apart: then lay a plank, or piece of timber three or four inches in width, and smooth on the upper side, upon the posts, and let it be pinned or nailed, to hold it firmly.

2. Prepare a piece of board four or five inches square, and smooth on the under side. Let one of the compass-sights be placed at right angles to the upper surface of the board, and let a nail be driven through the board, so that it can be tacked to the timber resting on the posts.

3. At about twelve feet from the stakes, and in the direction of the pole-star, let a plumb be suspended from the top of an inclined stake or pole. The top of the pole should be of such a height that the pole-star will appear about six inches below it; and the plumb should be swung in a vessel of water to prevent it from vibrating.





This being done, about twenty minutes before the time of elongation, place the board, to which the compass-sight is fastened, on the horizontal plank, and slide it east or west, until the aperture of the compass-sight, the plumb-line, and the star, are brought into the same range. Then if the star depart from the plumb-line, move the compass-sight, east or west, along the timber, as the case may be, until the star shall attain its greatest elongation, when it will continue behind the plumb-line for several minutes; and will then recede from it in the direction contrary to its motion before it became stationary. Let the compass-sight be now fastened to the horizontal plank. During this observation it will be necessary to have the plumb-line lighted: this may be done by an assistant holding a candle near it.

Let now a staff, with a candle or lamp upon it, be placed at a distance of thirty or forty yards from the plumb-line, and in the same direction with it and the compass-sight. The line so determined, makes, with the true meridian, an angle equal to the azimuth of the pole-star; and, from this line, the variation of the needle is readily determined, even without tracing the true meridian on the ground.

Place the compass upon this line, turn the sights in the direction of it, and note the angle shown by the needle. Now, if the elongation, at the time of observation, was west, and the north end of the needle is on the west side of the line, the azimuth, plus the angle shown by the needle, is the true variation. But should the north end of the needle be found on the east side of the line, the elongation being west, the difference between the azimuth and the angle would show the variation: and the reverse when the elongation is east.

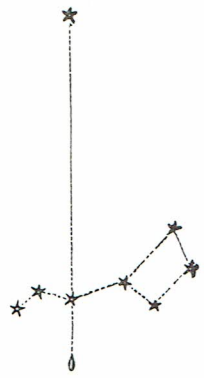
Note.—The variation of the needle should always be noted on every survey made with the compass, and then if the land

be surveyed at a future time, the old lines can always be re-run.

**123.** It has been found, by observation, that heat and cold sensibly affect the magnetic needle, and that the same needle will, at the same place, indicate different lines at different hours of the day.

If the magnetic meridian be observed early in the morning, and again at different hours of the day, it will be found that the needle will continue to recede from the meridian as the day advances, until about the time of the highest temperature, when it will begin to return, and at evening will make the same line as in the morning. This change is called the *diurnal variation*, and varies, sometimes, during the summer season, from one-fifth to one-fourth of a degree.

**124.** A very near approximation to a true meridian, and consequently to the variation, may be had, by remembering that the pole-star very nearly reaches the true meridian, when it is in the same vertical plane with the star Alioth in the tail of the Great Bear, which lies nearest the four stars forming the quadrilateral.



The vertical position can be ascertained by means of a plumb-line. To see the spider's lines in the field of the telescope, at the same time with the star, a faint light should be placed near the object-glass. When the plumb-line, the star Alioth, and the north star, fall on the vertical spider's line, the horizontal limb is firmly clamped, and the telescope brought down to the horizon; a light, seen through a small aperture in a board, and held at some distance by an assistant, is then moved according to signals, until it is





covered by the intersection of the spider's lines. A picket driven into the ground, under the light, serves to mark the meridian line for reference by day, when the angle formed by it and the magnetic meridian may be measured.

## SECTION IV.

### TRIANGULATION.

**125.** When a large extent of territory, or a long line of sea-coast is to be surveyed, it becomes necessary to consider the curvature of the earth's surface; this branch of surveying is called *Geodesic* surveying.

**126.** The operations necessary to the successful execution of a Geodesic Survey, require the minutest attention, and when performed, numerous corrections are to be applied to the measured lines and angles, on account of the various causes of error incident to such operations.

To investigate those causes of error, and to deduce rules for correcting the errors, in all cases, would far exceed the limits of an elementary treatise. We shall, therefore, attempt nothing more than a brief outline of the operations in a trigonometrical survey, in which the Plane-Table and Compass are used in connection with the Theodolite, and in which, the curvature of the earth is not considered. We shall then explain the methods of mapping, or plotting, such a survey. The example will be limited to the survey of the harbor, delineated in plate 6.

**127.** After having made a preliminary examination, or *reconnaissance* of the territory to be surveyed, suitable stations are selected at the most prominent points, and these points are marked by *staves* or *signals*.

We went back up to Illahe in October of 1961 for another timber cutting boundary line for a logger by the name of Schrader.

We didn't have to boat the Rogue river at Foster creek this time because Schrader had built a low water bridge. This consisted of three logs, two side by side parallel with the river and the third log on top of the other two. With one pile of logs on each side of the river, you float the stringers between, figure out how to raise them and start the deck. With the deck nailed down the old D-8 pushed up a pile of gravel on each end and you had a darn good bridge. Loggers in Curry county could build a bridge like this in one day providing they didn't run out of beer.

Our surveying trip was pretty well organized as before except we had a brand new blue and white Jeep station wagon and added a six-month-old Labrador dog to the crew. We found Claude Barton's complex occupied by Morgan's cutting crew so we had to stay at Lucas's lodge in Agness.

As we drove to our cabin we lamented the advance of civilization. Ma Bell had installed a telephone relay station complete with pay booth. The natives had either taken a disliking to progress or decided it needed ventilation for it was full of numerous bullet holes.

Lucas lodge is quite old and renowned the world over as headquarters of those who follow the wily steelhead. At this time Larry had six or seven cabins with cooking facilities, built like box cars and scattered under the trees. Since we were set up to cook, we bought into one of the 100° F. box cars. The main advantage this time was we got some of our rent money back by sneaking down in the evening and pulling young carrots and beets out of Larry's vast garden.



Also the Cougar Lane store was only a quarter mile away so when we arrived at night we had to drive right in front of the cold beer. Being prudent men we always looked both ways crossing the Agness airport.

Our coal black six months Lab weighed about 60 pounds and his name was Uncle Remus. We always left off the Uncle bit. Everything in the world was new and interesting to him and he soon fitted in with Larry's zoo of ducks, dogs, geese, chickens, horses, mules, peacocks and cows which wandered all over the ranch and airport.

This time we had a real surveying problem. Schrader had been running a mill on the north side of the Rogue river and about the time his timber began to run out he bought one whole square section on the south side of the river. Although it was the usual uphill, downhill, bluffs, cliffs, dead tan oak, live tan oak, madrona, myrtle, vine maple, huckleberry, pine, Douglas fir, and whatever, all we had to do was rerun the original government section lines and locate the original corners. The original lines in this contract had been run in 1882 by Wm. P. Wright, deputy government surveyor.

The Portland Cadastral Engineers who had occasions from time to time to retrace W.P.'s lines like wise old owls always told us to be sure and run a little to the right and, by gosh, they were right.

When we arrived on the scene Schrader already had two saw mills operating on the new tract on the south side of the river and had a heck of a lot of timber down, milled and hauled out. The Forest Service surrounded him completely and they just plain told him to get the darn thing surveyed or they would get an injunction.

Our first conversation with him was down at his trailer house next to the river where it was cool. We asked if he knew where any of the corners were so we could get on with the job. He had no idea where any corners were. So we asked him how he knew for sure whether either one of the mills was on the property. He replied that a government brass cap was near the mill on the north side of the river and he had sighted his compass from this corner south across the river about an airline mile away and sighted a single lone dead snag. So he built his low water bridge and then built a road up to the snag and built the

western one of the saw mills.

The eastern mill was a little more of a challenge. They got there by constructing in an easterly direction a rough logging road for hauling and naturally had to stay on a reasonable grade and contour the canyons.

He went on to say that he had a good timber cruising friend from Washington down one weekend and he paced the road from the western mill towards the east site. He allowed a little for the curves in the road and came to a nice flat ridge overlooking a rather steep creek canyon. All they had to do was level it off and dump all the sawdust and slab in the draw.

It was getting late in the day but we decided to drive up to the western mill and see what things looked like. On the way up we recognized one of Boyd and Morgan's old control lines. That meant luck was with us because that would lead us to one of the original government corners we needed.

We parked at the western mill and started to roam around the logs, ties, sawdust and whatever. Sure enough the end of the slab pile was within 3 feet of the iron pipe corner. Half the head rig in the mill was on the wrong side of the line and he had cut down one of the Witness trees. A perfect way to start a job.

They usually started the mills up around 4 a.m. on account of the heat and humidity which normally would make them shut down around 10:30 or 11 a.m. Then sometime around 2:30 p.m. or 3 p.m. they would start up again and run til 6 p.m. On some days they never started up period. That happened on our first day on the job so we started south on the west side of the section and crossed over the head rig without having to temporarily shut down the mill.

We always knew when it was getting hot by looking at our watches when the mills shut down. Those days when the mill didn't run at all we often wondered whether Forest Service rules shouldn't apply to us.

We finally got down to the southwest corner of the section and sure enough they had cut down and trespassed on the USFS about two or three acres of old growth fir. We consulted the government fieldnotes and it was easy to figure out why.



In past history the territory had been surveyed under two different contracts which resulted in a double set or, if you prefer, closing corners on this particular section line. Nothing unusual in the surveying business. They had just cut to the first corner they came to. We found the right one under a downed log.

We told Schrader on the way out that night what we had found and asked whether he had a set of government fieldnotes. No, he said, he never had time to get to Gold Beach for copies and besides that's what he had hired us for.

We didn't say anything then to Schrader but after we left the trailer we began to get worried, not because we already had found one small trespass but Schrader had already cut one mile against the north side of his section and almost a half mile on the east side of his section and he really didn't know the location of the mills. Since he hadn't logged anything against the south side of the section and part of the east and west side of the section we decided to concentrate on those lines first and at least keep him in bounds there.

Next day we started east on the south boundary of the section. It was real hot and the mills went down about 9:30 a.m. We had to climb over all kinds of fallen timber and the going was slow. Pretty soon we could hear Remus howling, crying, and all those noises a dog can make. I said maybe I better go back but Lee, my old government hunter, said forget it, he's just a pup and can't figure out how to get over the logs. As usual he was right and about an hour later Remus came galloping up and down over logs with that big old red tongue out about a foot.

Before the job was over he was as agile as a cat and could walk on 4 inch diameter downed trees and jump back and forth across logs with a great deal more confidence than we could. He was always out in front, usually on top of a big boulder or immersed up to his nose in a creek wondering what took us so long to get there.

He helped us out one hot day by doing the barking bit. This time our tongues were out about a foot and drink of water was way overdue. He was making noise close enough to the line so I strayed over and checked to see what was going on. We had porcupines in the area and I

sure didn't want to get mixed up in one of those situations. Old Remus was merely sitting in the middle of a 3 foot deep pool at the bottom of a spring.

We found the closing corner and the southeast corner of Schrader section with no trouble. So we turned and headed north along the east boundary. We had a lot of open oak and the going was pretty good for awhile. The fieldnotes didn't fit worth a damn and when we got to the area where the east quarter corner was supposed to be, nothing fit and we never found the corner.

On to the north we continued our line which proceeded to get steep. About 500 feet more and all of a sudden all we can see is daylight and blue sky. This is for two reasons: first we are on top of a fair to middling cliff and all the country to the west and east of us for nearly 300 feet has been logged. Our friend has apparently severed a strip of timber belonging to Uncle Sam over 2100 feet long and 300 feet wide.

We continued on down the bluffs hanging on to everything we can find and at one mile we arrived at the location for the northeast corner of the section. The situation has only one good thing going for it and that is that the sawmill is on the right side of the line. The rest is all bad. Our temporary northeast corner is on the south side of the creek as called for in the government fieldnotes but the creek is buried under 30 or 40 feet of sawdust and slab which spreads at least 200 feet up and down the creek canyon. This alleviates looking for witness trees, two small maples and two small oaks.

Also to add to the gloom Schrader had logged to at least 150 feet north of the creek. We didn't even stop at his place that night.

Next day we continued on north from our temporary northeast corner. It was hard going, all tanoak broken down from snow intergrown with huckleberry. We were lucky to make our half mile that day.

On the way back to Agness Morgan flagged us down and wanted us to stop for dinner, the next night. We gladly accepted. Well, it turned out to be quite a day. We left Agness early and drove to the eastern mill, walked our line downhill to our equipment and pushed on north. At noon we crossed the South Bank Rogue River trail and



ate lunch in the shade with our bare feet in the river. We only had one problem ahead of us. We had to cross that darn river and at this point it had to be nearly 600 feet wide. Now to Remus that was a picnic in a park.

We could see a small prairie up river so curiosity drew us that way first. Lo and behold, it was a homestead. The house had fallen down but the barn was still standing. Inside we found two sacks hanging from the ceiling with fishnets. We knew all the illegal angles related to that. We summed up our assets and proceeded as follows. First the four foot wide barn door went back to our line. A return to said homestead produced four fence posts from the corral. Nails we picked up from a burned smokehouse (probably had something to do with the nets). A wash tub was secured intact from the fallen cabin.

The fence posts are now nailed to the barn door for added flotation, the wash tub is nailed to the top for our clothes, boots, transit and chain. Our tripod and brush hooks are gently placed on the deck. We returned to the line and cut three poles. Two are set on the N-S line and the third is set at right angles to the first 200 feet west for our precise triangulation network.

Three very white rear ends and one very black one faced south as we pushed our Ark into the mighty Rogue and headed north across the river. The swim is quite refreshing and there are no mishaps except at one point Remus attempts to climb aboard our ship for a free ride.

We assemble on the North Bank, complete our triangulation and continue north up the hill to the well traveled North Bank Rogue River trail. There we find a Forest Service sign that says our next corner is but a mere 300 feet above the trail. With glee we chain a precise 300 feet and commence our search.

Two hours later we have neither uncovered nor recovered nor found anything resembling a corner. Time is running short, we remember our dinner date, and sorrowfully head back to the ship. The only difference now is the rear ends face north instead of south. On the south side we draw straws to see who goes up the line and gets the jeep. I lose. The other two walk the river trail downstream to where it crosses the road. Although we are a little late we arrive at Morgan's house for a much antici-

pated dinner. There was a simple note nailed to the door: "Broke hydraulic hose on cat. Gone to Powers. See you tomorrow night."



A

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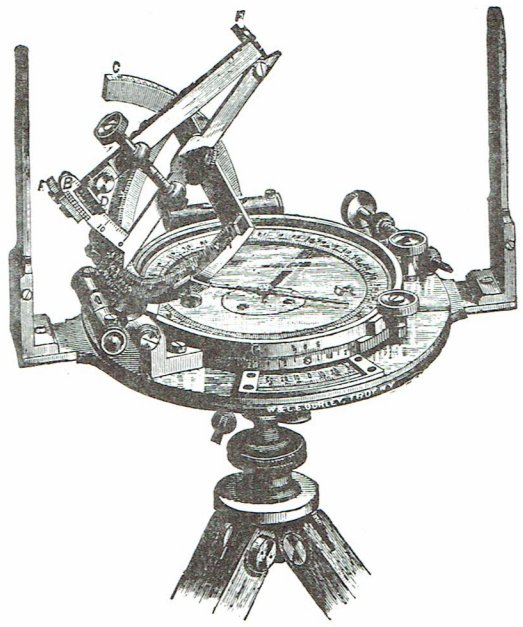

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## CHAINS.

### *Surveyors' Chains.*

***Four Pole Chains.***—The ordinary surveyors' chain is sixty-six feet, or four poles long, composed of one hundred links, each connected to the other by two rings, and furnished with tally marks at the end of every ten links.

In all the chains we manufacture, the rings are oval, are sawed, and well closed, the ends of the wire forming the hook being also filed and bent close to the link, so as to avoid the danger of "kinking."

A link in measurement includes a ring at each end.

The handles are of brass, and each forms part of the end links, to which it is connected by a nut, by which also the length of the chain is adjusted.

The tallies are also of brass, and have one, two, three, or four notches, as they are ten, twenty, thirty, or forty links, from either end; the fiftieth link is rounded, so as to distinguish it from the others.

***Two Pole Chains.***—In place of the four pole chain just described, many surveyors prefer one of two rods or thirty-three feet long, having but fifty links, and counted by its tallies from one end in a single direction.

***Snap for Altering Chains.***—We often make four pole chains so arranged, that by detaching a steel snap in the middle, the two parts can be separated, and then one of the handles being removed in the same manner, and transferred to the forty-ninth link, a two pole chain is readily obtained. This modification is only made without charge if ordered with the chain.

***Sizes of Wire.***—Our surveyors' chains are made of the best refined iron wire, of sizes No. 8 or 10, as may be preferred; the diameter of No. 10 wire being about one-eighth

of an inch, and that of No. 8 wire nearly five thirty-seconds of an inch.

*Engineers' Chains*

Differ from the preceding, in that the links are each 12 inches long; the wire, also, is usually much stronger.

They are either fifty or one hundred feet long, and are furnished with swivel handles, tallies, &c.

In place of the round rings commonly made, we have substituted in these, and our other chains, rings of an oval form, and find them almost one-third stronger, though made of the same kind of wire.

The wire used for these chains is of sizes Nos. 8, 10, and 12, is of the first quality, and the whole chain is well and accurately made.

*Steel Chains.*

Chains made of steel wire, though more costly than those which we have just described, are yet often preferred on account of their greater strength.

They are made of any desired size or length, generally of No. 10, rarely of No. 8 wire, and are very stiff and strong.

***Brazed Steel Chains.***—A very portable and excellent measure is made, by a light steel chain, each link and ring of which is securely *brazed*, after being united together and tested; the wire is also tempered.

The wire generally used by us is of size No. 12, or about seven sixty-fourths of an inch diameter; the rings are of oval form, the chain, though exceedingly light, is almost incapable of being either broken or stretched.

Our steel brazed chains have been found exceedingly desirable for all kinds of measurement, and for the use of engineers upon railroads and canals have almost entirely superseded the heavier chains.





*Grumman's Patent Chains.*

These chains, invented and patented by J. M. Grumman, of Brooklyn, N. Y., are made of very light steel wire, the links being finely tempered, and, as shown in the illustration,

so formed at the ends as to fold together readily, and thus dispense with the use of rings.

This construction gives only one-third as many wearing points as the ordinary chain, and affords the utmost facility for repairs, from five to ten extra links being furnished with each chain, which have only to be sprung into place to replace such as may have been broken; it can also be taken apart at any link, and, by having a spring-catch on either handle, be made of any length desired. These chains are made of three different sizes of wire—the first two, termed drag-chains, being of size No. 12 and 15, and used for measuring on the surface, like the ordinary chain; and the second, called the "suspended-chain," for very accurate measurements, made of No. 18 wire, and with spring-balance, thermometer and spirit-level attachments, to be held above the surface when in use, the extremities of the chain being marked upon the ground by the points of plummets let fall from the ends of the chain.

The drag-chains are all that are needed in common land surveys; for a mixed practice of village and country surveying, the spring-balance should be attached to the drag-

* No. 15 wire is about $\frac{1}{16}$ inch diameter.

chains, while for city surveying the suspended chain, with all its attachments, is the proper instrument.

We have purchased the patent for the Grumman chains, with the entire right to make and sell them, and shall be able to furnish them promptly.

### *Vara Chains.*

The Spanish or Mexican Vara, which is in very general use in Texas, Mexico, and Cuba, is 33.372 inches long. The chains are made of ten or twenty varas, each vara being usually divided into five links; a link, including a ring at each end, is, therefore, 6.674 inches. A chain of ten varas has fifty links; of twenty varas one hundred links. Each vara is marked by a round brass tally, numbered from one to nine in the ten-vara chain, and from one to nineteen, in the twenty-vara chain. Sometimes, but rarely, the vara is divided into four links; a ten-vara chain then has forty links, and a twenty-vara, eighty links.

### *Meter Chains.*

The French Meter is very generally used as a standard in South America, and chains of ten and twenty meters are often ordered; they are made either of iron or steel wire as desired, the number of links to a meter and the tallies being similar to those of the Vara.

### *Marking Pins.*

In chaining, there are needed ten marking pins, or chain stakes, made either of iron, steel, or brass wire, as may be preferred, about fourteen inches long, pointed at one end to enter the ground, and formed into a ring at the other, for convenience in handling.



## Hubbard Mound

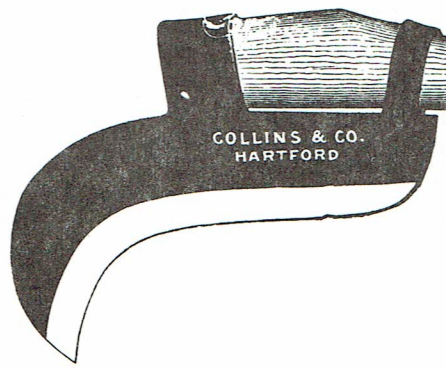
We took on a job for U. S. Plywood in September 196 to survey a piece of coastline north of Rogue river, th theory being to separate their ownership from the recer sale they had made to the State of Oregon.

The land lay all on the west side of Relocated Orego Coast Highway 101 and east of the ordinary high tideli of the Pacific ocean. In the agreement we were suppose to cut parallel line sections east and west 100 feet apar starting at the south side of the tract and continuing the north boundary of U. S. Plywood property.

We at least knew where to start in this case and b climbing on hand and foot like dogs through the hazel ar azalea arrived at the section corner. Many minutes lat we cleared enough brush to stand up and set up the tra sit. Then we began the line west to 101 about 700 feet. watched the two chainsaws hack away for an hour. checked the chain and we had moved ahead 150 feet. W could hear but not see traffic on good old 101.

Along about noon it got plain boring for this trans man, so I hiked out to the old county road and the ri drove back to Gold Beach and bought another chainsaw returned to the project and the crew still hadn't cut out the highway.

This time I parked out on 101 and I could hear the cre but I could not see them. I lined up as best I could and c back to them. They had no choice but to keep on cutti because I had the lunch. The theory on 100 foot paral lines began to lose its attraction. The second day 800 feet was the length of line we cut with three saws counting jumped chains, running out of gas, punctured oil can, dull files, and lost chainsaw tools, but we made it to the top of the bluff overlooking the beach.



Cutting our trail ahead was interesting because in going over the mounds of brush we would have people standing on apparent solid ground only to suddenly disappear into mining ditches dug by the 1855 beach miners, six to ten feet deep.

Also as we approached the beach we found a new menace. The northwest wind had blown sand into the brush and coated it very well which took completely away what little edge you had left on your chainsaw. Needless to say we talked our way out of the parallel line bit as we figured it would take us the better part of a year to do it.

The following list is the lineup of our vegetation opposition:

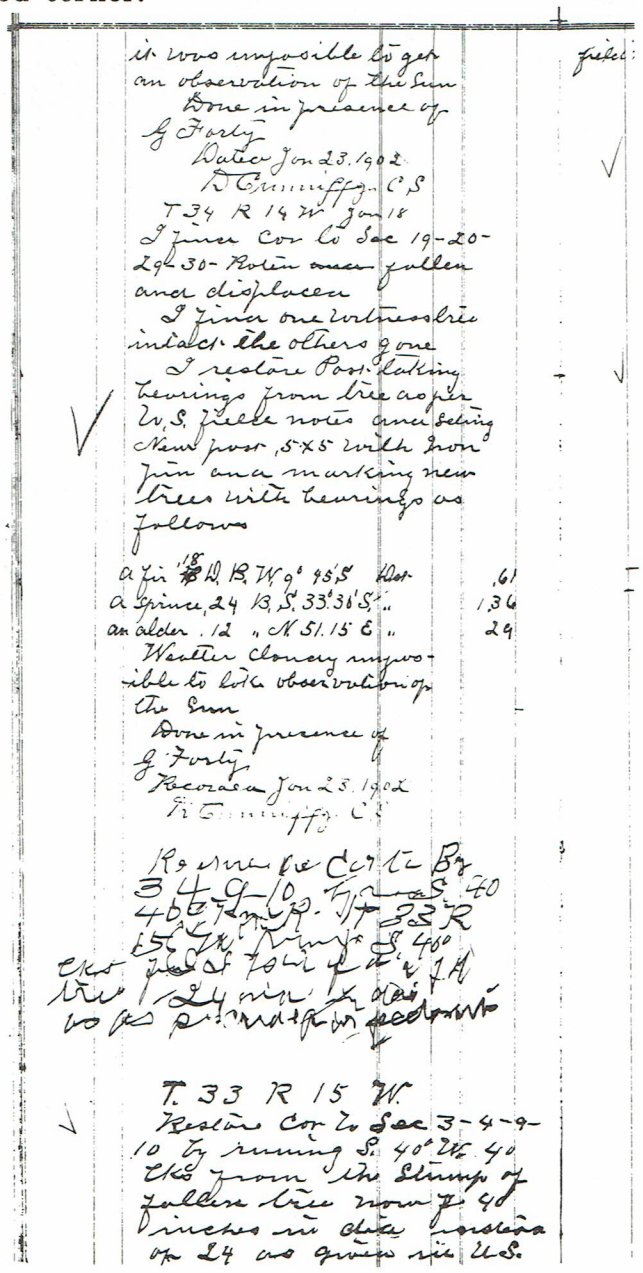
| | |
|---|---|
| Ocean Spray | Holodiscus discolor |
| Alder, Oregon or Red | Alnus oregona |
| Cascara (Chittum) | Rhamnus Purshiana |
| Salal | Gaultheria Shallon |
| Huckleberry, red | Vaccinium parvifolium |
| Huckleberry, blue | Vaccinium occidentale |
| Sitka Spruce | Picea sitchensis |
| Hazel, western | Corylus cornuta var. californica |
| Coyote brush | Baccharis piluraris |
| White Fir | Abies concolor |
| Coast Pine | Pinus contorta |
| Twin berry | Lonicera involucrata |
| California Wax Myrtle | Myrica californica |
| Silk Tassel | Garrya elliptica |
| Azalea | Rhododendron occidentale |
| Salmon Berry | Rubus spectabilis |
| Thimble Berry | Rubus parviflorus |
| Sword Fern | Polystichum munitum |
| Wild Rose probably | Rosa nutkana |
| Indian Plum | Osmaronia cerasiformis |
| Blackberry (Western Dewberry) | Rubus vitifolius |



| | |
|---|---|
| Fire Weed | Erechtites prenanthoides |
| Skunk Cabbage | Lysichitum americanum |
| Coast Willow | Salix Hookeriana |
| cut grass probably | Leersia oryzoides |
| Madrone | Arbutus Menziesii |
| Blue brush (Buck brush) | Ceanothus sanguieus |
| Currant, red flowering | Ribes sanguineum |
| Cherry probably | Prunus emarginata |
| Tan Oak | Lithocarpus densiflora |

## Restored Corners

In days gone by county surveyors were paid a fee for restoring government survey corners. The price was the same as a gallon of whisky. Below find a good example of a restored corner.



it was impossible to get an observation of the Sun
Done in presence of
G Forty
Dated Jan 23. 1902
R Cruikshank C S
T 34 R 14 W Jan 18
I find Cor to Sec 19-20-29-30- Rotten ones fallen and displaced
I find one witness tree indicated the others gone
I restore Post taking bearings from tree as per U.S. field notes and setting New post 5"x5" with iron pin and marking new trees with bearings as follows

a fir 18" D. B. W. 9° 45'S 61
a Spruce 24 " S. 33° 30' S " 1.36
an alder 12 " N. 51. 15 E " 29

Weather cloudy unfavorable to take observations on the Sun
Done in presence of
G Forty
Recorded Jan 23. 1902
R Cruikshank C S

T. 33 R 15 W.
Restore Cor to Sec 3-4-9-10 by running S. 40° W. 40 lks from the Stump of fallen tree now 40 inches in diameter on 24 as given in U.S.





*209.220 Oath taken by chainmen and markers.* Each chainman and marker employed by the county surveyor or his deputy shall, before commencing the duty assigned him, take an oath or affirmation faithfully and impartially to execute the duties of his employment. The county surveyor or his deputy shall administer the oath or affirmation of each chainman and marker.

State of Oregon }
County of Curry } ss

I Con McGeehin, do solemnly swear; that I will faithfully execute the duties of chain carrier; That I will level the chain upon uneven ground and plumb the tally pins, whether by sticking or dropping the same; That I will report the true distance to all notable objects, and the true length of all lines that I assist in measuring, to the best of my skill and ability;

Subscribed and sworn to before me this 28th day of July A.D. 1878;

Con—McGeehin

J. L. Evans
County Clerk

We had a good friend "Bill" who decided to promote a passenger boat trip up Rogue river from Gold Beach farther than anyone else had ever attempted. The terminus was about 60 miles up at a most appropriate place called Paradise Bar.

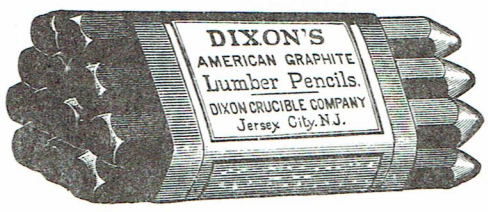
This location was a well known haven for boat drifters coming down Rogue river from Grants Pass. Accommodations for campers and steelheaders had been there for a long while. It was run by a friendly bush pilot by the name of Deke and his wife. It had a dirt surface airport, probably not too highly recommended by the FAA, but Deke's Supercub went in and out practically every good flying day for supplies and mail at Agness.

When I first looked at the runway on an aerial photo I noticed it was constructed on a curve. This was logical because in order to have sufficient takeoff length you had to follow the bend in the river. A straight shot merely aimed you into a 2000 foot mountain.

Paradise Bar just about had to be the terminus of any boat trip up river because it lay just downstream from Blossom Bar which is an indescribable pile of boiling water and boulders. Blossom Bar has probably taken toll of more boating equipment on Rogue river than any other rapid.

Glenn Wooldridge the Rogue's oldest, wiliest, and most experienced boat pilot took us up to the lower end one time. We parked the boat and climbed over the rocks a ways for a good view. We asked him if a jet boat could go upstream. He didn't think very long before he said "Yes, it can be done, but you better have a damn good reason".

Another old downstream drifter, Ruel Hawkins, (now long gone) sat up on a view point with my dad one spring sizing it up. Dad said, "Ruel, that doesn't look much worse than the others we've been over." Ruel returned, "Well, you look out here real






close. Most of that water you see out here is foam and boats don't float on foam".

No one doubted Bill's boating ability and the main thing that was going to get him up to Paradise was the recent success of jet powered units; no propeller or lower unit or rudder to drag over the rocks. With enough power and the right hull Bill could jet a boat with 10 to 12 passengers at 35 to 40 miles an hour in four inches of water.

The venture got off to a slow start but thru Bill the Paradise Bar trip was born. Somewhere along the line he purchased a piece of property at Paradise. He wasn't sure where it was and neither was the party he purchased it from. Between us we frequently discussed this property dilemma and I being terribly interested in taking this flying trip up the river agreed to do the basic survey just for the ride.

All this was quite agreeable. When it finally happened it was still summer, tourist weather, but business was slow so on very short notice we decided to go up after work on a Friday, attempt to do the necessary work on Saturday and return the same day.

All this settled, my assistant and I explained in detail our good intention, or as some might say made peace with our wives, and headed for the dock. We made the usual side trip to Oregon's well known Green Front Store and arrived at the dock about 5 p.m.

We loaded our gear in the Steelhead as she was called, had a nip and went back up the dock ramp to the resort area. Here we ran into the county assessor, a pleasant young, married, athletic chap, by the name of Pat. He was sitting on a bench with a small duffle bag and a brown paper bag very similar to ours.

We struck up a conversation, tried a sample of his false courage and discovered he was going to Paradise Bar to make the usual six year reappraisal. Bill arrived about this time, mumbled something about a battery, said sit still, went down to the dock, came back and headed to town.

In the meantime we discussed with ample adjectives properly reenforced, from time to time, how adventurous this was going to be. At 6 p.m. here comes Bill and he has something besides his battery. We are cordially intro-

duced to Laura, Annie and Melba, three of the town's ample quota of divorcees.

Bill indicates the way to the boat and the threesome with a certain amount of giggling head down the gang plank, each clutching a long familiar brown kraft paper sack.

The three of us stand there looking at Bill who has a look on his face as if the battery he is holding weighs about a ton. "God", he says, "I forgot all about them. I run into them at the Sunset Inn last night and promised them a trip to Paradise without even thinking about you guys".

Being somewhat committed we left anyway although I refrained from looking back in case the wife and the kids might have come down to wave goodbye to us. The trip to Agness, which is about half way to Paradise, went by rapidly. Bill's boat performed remarkably well and was fast enough so we could easily run down the fish ducks.

The males voted against stopping at Agness because everyone up there knew everyone, and I mean everyone. Above Agness life jackets are a must as the river changes from shallow gravel bars and riffles to bed rock and rapids; a bad pass and you sink.

Refreshments took second billing from here on as we cross Shasta Costa, Two Mile, Clay Hill, Camp Tacoma, just to name a few, and finally to Paradise. We arrive just at dusk and of course Deke and his wife are ready for anything anytime, no question asked.

Proper room assignments are made while dinner is prepared. I checked with Deke on where the nearest survey corner was and he assured me he could show it to us in the A.M. I never asked anyone what their strategy was going to be but I decided to get very drunk, eat dinner and go to bed, which I proceeded to do.

My assistant apparently arrived at some similar plan because we both woke up in the same room about 6 a.m. Deke's wife had breakfast ready for us and after chewing it down, Deke took his shotgun and we took our survey gear and headed out for the corner. The shotgun was for rattlesnakes, of course.

We passed the old main ranch house on our way and Deke, with a big smile on his face, placed a finger over his lip as a caution of silence. Later on up the hill he said Bill



likes to sleep in late. He had a twinkle in his eye with that same damn smile.

Deke got us to the corner OK and then took off as he had to fly to Agness. We took a solar observation at the corner stone and began a traverse toward Bill's claim. The hot sun cooked the first pain out of us and when we crossed a creek we soaked the rest out by dunking our heads in the first deep pool we could find.

Now the survey problem was simple enough. Three river frontage tracts all adjoining had been sold. The beginning points were all described from the stone from which we started. The first tract was supposed to have a house on it. The line between tract 1 and 2 was described as the centerline of a creek canyon. Tract 2 went from the centerline of the creek canyon down river a specified distance. Tract 3 was whatever was left over downstream to the downstream boundary of Deke's property. Bill was supposed to own Tract 2.

By 1 p.m. we reached the southwest corner of the house. We surveyed into the bottom of the creek canyon. We took a bearing of the centerline of the creek, which was well defined, straight for a considerable distance and nearly at right angles to the Rogue river. We then ascended to a bench on the opposite side of the creek and left two reference stakes for future use. We had several pages of notes and that was about all we could do until we calculated our position. We returned to Deke's for a late lunch.

Pat and Melba had gone up the trail to Blossom Bar. I don't know why, it was way too hot for hiking and there wasn't any land to appraise. Annie was sitting on the front porch like a wet hen, or maybe it was a hangover.

Laura and Bill were down at the boat and from where we were it looked like he had dismantled the whole motor. Deke said he couldn't get it to run. By now it was 3 p.m. and we were supposed to be on our way down. We packed all our gear down and crudely asked Bill how soon we were going to leave. He said he didn't know and if Laura hadn't been bailing his sweat out of the boat it would have swamped long ago.

Bill was a good mechanic and had the necessary tools. He felt it was carburetion for she would run good for a ways and then lose about two-thirds of its power. A situa-

tion like that going over Clay Hill could be suicide. At 4 p.m. Bill said to hell with it, put it together and said let's go. Deke said he would fly over us as far as Two Mile and if we made it that far we would at least be in the Agness area.

Everything Bill said was right. We would go like a bat for a couple of thousand feet and then just quit to trolling speed. Clay Hill was the key. It is a rapid constructed like a right angle. The downstream turn is to the left. You roar full bore over the first white water towards a boulder rock bar. About the time you think you are on shore you jam the boat in full reverse, back up just enough to turn left, re-aim the boat and go ahead full bore. The whole drop is about 6 feet.

We made it thru Clay Hill although I think Bill was the only one with his eyes open. We crippled along to the top of Two Mile and then Deke wobbled his wing and headed back for Paradise. Half way down Two Mile our power failed. We went right on ahead but with no power and with no power no jet, and no jet means no steering.

Bill hit the key and she started but we hit bottom anyway. We drifted into slack water. We lifted the cover on the pump intake and the mountings were pulled loose and the ribs split. We were leaking, but not bad. By running quarter throttle we could navigate. Passing Agness we made no visible impression on man nor beast. Around 11 p.m. with the moon high in the sky we limped into the dock on the lower Rogue.

Not much was said by anyone as we split up and went our various ways. Don, my assistant and I had the most equipment so we were last to leave. "Don", I said, "I don't know what your story is going to be when you get home but mine is just going to be the plain truth". He replied, "That's exactly what I was going to say." We laughed like hell all the way home.

As it turned out after we computed our survey traverse the results indicated nothing was right. We couldn't even figure out the intent of the written deeds. Tract 1 with the house wasn't even close to where it should be.

Bill's boat problem had nothing to do with the carburetor at all. The problem was a few metal filings inside the gas tank that plugged the screen on the fuel line intake



when he gave it full throttle. Typically, Bill did just what I thought he would. At a weak moment he sold his tract at Paradise. He used the same property description for the sale as was used when he purchased it.

# MANUAL

OF

# SURVEYING INSTRUCTIONS

FOR THE

## SURVEY OF THE PUBLIC LANDS

OF THE

## UNITED STATES

AND

## PRIVATE LAND CLAIMS.

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Prepared in conformity with law under the direction of
THE COMMISSIONER OF THE GENERAL LAND OFFICE.

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JANUARY 1, 1902.

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WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1902.



DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
*Washington, D. C., January 1, 1902.*

GENTLEMEN:

The following instructions, including full and minute directions for the execution of surveys in the field, are issued under the authority given me by sections 453, 456, and 2398, United States Revised Statutes, and must be strictly complied with by yourselves, your office assistants, and deputy surveyors.

All directions in conflict with these instructions are hereby abrogated.

In all official communications, this edition will be known and referred to as the Manual of 1902.

Very respectfully,

BINGER HERMANN,
*Commissioner.*

TO SURVEYORS GENERAL OF THE UNITED STATES.

# MANUAL OF SURVEYING INSTRUCTIONS.

## HISTORY OF LEGISLATION FOR SURVEYS.

1. The present system of survey of the public lands was inaugurated by a committee appointed by the Continental Congress, consisting of the following delegates:

| | |
|---|---|
| Hon. THOS. JEFFERSON, Chairman | Virginia. |
| Hon. HUGH WILLIAMSON | North Carolina. |
| Hon. DAVID HOWELL | Rhode Island. |
| Hon. ELBRIDGE GERRY | Massachusetts. |
| Hon. JACOB READ | South Carolina. |

On the 7th of May, 1784, this committee reported "An ordinance for ascertaining the mode of locating and disposing of lands in the western territory, and for other purposes therein mentioned." This ordinance required the public lands to be divided into "hundreds" of ten geographical miles square, and those again to be subdivided into lots of one mile square each, to be numbered from 1 to 100, commencing in the northwestern corner, and continuing from west to east and from east to west consecutively. This ordinance was considered, debated, and amended, and reported to Congress April 26, 1785, and required the surveyors "to divide the said territory into townships of 7 miles square, by lines running due north and south, and others crossing these at right angles. * * * The plats of the townships, respectively, shall be marked by subdivisions into sections of 1 mile square, or 640 acres, in the same direction as the external lines, and numbered from 1 to 49. * * * And these sections shall be subdivided into lots of 320 acres." This is the first record of the use of the terms "township" and "section."

2. May 3, 1785, on motion of Hon. William Grayson, of Virginia, seconded by Hon. James Monroe, of Virginia, the section respecting the extent of townships was amended by striking out the words "seven miles square" and substituting the words "six miles square." The records of these early sessions of Congress are not very full or complete; but it does not seem to have occurred to the members until the 6th of May, 1785, that a township six miles square could not contain 49 sections of 1 mile square. At that date a motion to amend was made, which provided, among other changes, that a township should contain 36 sections; and the amendment was lost. The ordinance as finally passed, however, on the 20th of May, 1785, provided for townships 6 miles square, containing 36 sections of 1 mile square. The first public surveys were made under this ordinance. The townships, 6 miles square, were laid out in ranges, extending northward from the Ohio River, the townships being numbered from south to north, and the ranges from east to west. The region embraced by the surveys under this law forms a part of the present State of Ohio, and





is usually styled "The Seven Ranges." In these initial surveys only the exterior lines of the townships were surveyed, but the plats were marked by subdivisions into sections of 1 mile square, and mile corners were established on the township lines. The sections were numbered from 1 to 36, commencing with No. 1 in the southeast corner of the township, and running from south to north in each tier to No. 36 in the northwest corner of the township, as shown in the following diagram:

| | | | | | |
|---|---|---|---|---|---|
| 36 | 30 | 24 | 18 | 12 | 6 |
| 35 | 29 | 23 | 17 | 11 | 5 |
| 34 | 28 | 22 | 16 | 10 | 4 |
| 33 | 27 | 21 | 15 | 9 | 3 |
| 32 | 26 | 20 | 14 | 8 | 2 |
| 31 | 25 | 19 | 13 | 7 | 1 |

The surveys were made under the direction of the Geographer of the United States.

3. The act of Congress approved May 18, 1796, provided for the appointment of a surveyor general, and directed the survey of the lands northwest of the Ohio River, and above the mouth of the Kentucky River, "in which the titles of the Indian tribes have been extinguished." Under this law one half of the townships surveyed were subdivided into sections "by running through the same, each way, parallel lines at the end of every two miles, and by making a corner on each of said lines at the end of every mile," and it further provided that "the sections shall be numbered, respectively, beginning with the number one in the northeast section and proceeding west and east alternately, through the township, with progressive numbers till the thirty-sixth be completed." This method of numbering sections, as shown by the following diagram, is still in use:

| | | | | | |
|---|---|---|---|---|---|
| 6 | 5 | 4 | 3 | 2 | 1 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 18 | 17 | 16 | 15 | 14 | 13 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 30 | 29 | 28 | 27 | 26 | 25 |
| 31 | 32 | 33 | 34 | 35 | 36 |

4. The act of Congress approved May 10, 1800, required the "townships west of the Muskingum, which * * * are directed to be sold in quarter townships, to be subdivided into half sections of three hundred and twenty acres each, as nearly as may be, by running

parallel lines through the same from east to west, and from south to north, at the distance of one mile from each other, and marking corners, at the distance of each half mile, on the lines running from east to west, and at the distance of each mile on those running from south to north. * * * And the interior lines of townships intersected by the Muskingum, and of all the townships lying east of that river, which have not been heretofore actually subdivided into sections, shall also be run and marked. * * * And in all cases where the exterior lines of the townships thus to be subdivided into sections or half sections shall exceed, or shall not extend, six miles, the excess or deficiency shall be specially noted, and added to or deducted from the western and northern ranges of sections or half sections in such townships, according as the error may be in running the lines from east to west or from south to north."

5. The act of Congress approved February 11, 1805, directs the subdivision of the public lands into quarter sections, and provides that all the corners marked in the public surveys shall be established as the proper corners of sections, or subdivisions of sections, which they were intended to designate, and that corners of half and quarter sections not marked shall be placed, as nearly as possible, "equidistant from those two corners which stand on the same line." This act further provides that "The boundary lines actually run and marked * * * shall be established as the proper boundary lines of the sections or subdivisions for which they were intended; and the length of such lines as returned by * * * the surveyors * * * shall be held and considered as the true length thereof, and the boundary lines which shall not have been actually run and marked as aforesaid shall be ascertained by running straight lines from the established corners to the opposite corresponding corners; but in those portions of the fractional townships, where no such opposite or corresponding corners have been or can be fixed, the said boundary lines shall be ascertained by running from the established corners due north and south or east and west lines, as the case may be, to the * * * external boundary of such fractional township."

6. The act of Congress approved April 25, 1812, provided "That there shall be established in the Department of the Treasury an office to be denominated the General Land Office, the chief officer of which shall be called the Commissioner of the General Land Office, whose duty it shall be, under the direction of the head of the Department, to superintend, execute, and perform all such acts and things touching or respecting the public lands of the United States, and other lands patented or granted by the United States, as have heretofore been directed by law to be done or performed in the office of the Secretary of State, of the Secretary and Register of the Treasury, and of the Secretary of War, or which shall hereafter by law be assigned to the said office."

7. The act of Congress approved April 24, 1820, provides for the sale of public lands in half-quarter sections, and requires that "in every case of the division of a quarter section the line for the division thereof shall run north and south * * * and fractional sections, containing 160 acres and upward, shall, in like manner, as nearly as practicable, be subdivided into half-quarter sections, under such rules and regulations as may be prescribed by the Secretary of the Treasury; but fractional sections containing less than 160 acres shall not be divided."





8. The act of Congress approved May 24, 1824, provides "That whenever, in the opinion of the President of the United States, a departure from the ordinary mode of surveying land on any river, lake, bayou, or water course would promote the public interest, he may direct the surveyor general in whose district such land is situated, and where the change is intended to be made, under such rules and regulations as the President may prescribe, to cause the lands thus situated to be surveyed in tracts of two acres in width, fronting on any river, bayou, lake, or water course, and running back the depth of forty acres."

9. The act of Congress approved May 29, 1830 (secs. 2412, 2413, R. S.), provides for the fine and imprisonment of any person obstructing the survey of the public lands, and for the protection of surveyors, in the discharge of their official duties, by the United States marshal, with sufficient force, whenever necessary.

10. The act of Congress approved April 5, 1832, directed the subdivision of the public lands into quarter quarters; that in every case of the division of a half-quarter section the dividing line should run east and west; and that fractional sections should be subdivided under rules and regulations prescribed by the Secretary of the Treasury. Under the latter provision the Secretary directed that fractional sections containing less than 160 acres, or the residuary portion of a fractional section, after the subdivision into as many quarter-quarter sections as it is susceptible of, may be subdivided into lots, each containing the quantity of a quarter-quarter section, as nearly as practicable, by so laying down the line of subdivision that they shall be 20 chains wide, which distances are to be marked on the plat of subdivision, as are also the areas of the quarter-quarters and residuary fractions.

The last two acts above mentioned provided that the corners and contents of half-quarter and quarter-quarter sections should be ascertained, as nearly as possible, in the manner and on the principles directed and prescribed in the act of Congress approved February 11, 1805.

11. The act of Congress approved July 4, 1836, provided for the reorganization of the General Land Office, and that the executive duties of said office "shall be subject to the supervision and control of the Commissioner of the General Land Office under the direction of the President of the United States." The repealing clause is, "That such provisions of the act of the twenty-fifth of April, in the year one thousand eight hundred and twelve, entitled 'An act for the establishment of a General Land Office in the Department of the Treasury,' and of all acts amendatory thereof, as are inconsistent with the provisions of this act, be, and the same are hereby, repealed."

From the wording of this act it would appear that the control of the General Land Office was removed from the Treasury Department, and that the Commissioner reported directly to the President; but, as a matter of fact, the Secretary of the Treasury still had supervisory control, for the act of Congress approved March 3, 1849, by which the Department of the Interior was established, provided, "That the Secretary of the Interior shall perform all the duties in relation to the General Land Office, of supervision and appeal, now discharged by the Secretary of the Treasury * * *." By this act the General Land Office was transferred to the Department of the Interior, where it still remains.

12. In 1855 a manual of instructions to surveyors general was prepared, under the direction of the Commissioner of the General Land Office, by John M. Moore, then principal clerk of surveys, and the act of Congress approved May 30, 1862 (sec. 2399, R. S.), provided "That the printed manual of instructions relating to the public surveys, prepared at the General Land Office, and bearing the date February twenty-second, eighteen hundred and fifty-five, the instructions of the Commissioner of the General Land Office, and the special instructions of the surveyor general, when not in conflict with said printed manual or the instructions of said Commissioner, shall be taken and deemed to be a part of every contract for surveying the public lands of the United States."

13. The instructions contained in this volume are issued under the authority given in the clause in said act providing that "The instructions of the Commissioner of the General Land Office * * * shall be taken and deemed to be a part of every contract for surveying the public lands of the United States."

14. The following comprises so much of the general laws relating to the survey of the public domain as it is deemed necessary to incorporate in this volume, reference being made by chapter and section to the codification of the Public Land Laws, prepared pursuant to acts of Congress approved March 3, 1879, and June 16, 1880, and by section number to the Revised Statutes of the United States.



# PIONEER HISTORY

OF

## Coos and Curry Counties, Or.

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Heroic Deeds and Thrilling Adventures of the Early Settlers.

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Published Under the Auspices of the Pioneer and Historical Association of Coos Co.

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ORVIL DODGE, Historian.

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SALEM, OREGON.
CAPITAL PRINTING CO.
1898.

HERMANN, HON. BINGER. Mr. Hermann was born in Lonaconing, Pennsylvania, in 1843. The son of that Dr. Henry Hermann, who, as narrated elsewhere in this work, founded the colony of Baltimore immigrants on the headwaters of the Coquille. The son received a suitable education in various country schools, and at the Irving college in Winchester, Md., graduating from the latter institution at the age of seventeen. In 1879 the Hermanns set out with about twenty other families, like themselves of German descent and after a long voyage came to Port Orford, and eventually found their way to the fertile and beautiful country on the South Fork of the Coquille, and there located permanently, colonizing the region, and doing their utmost to bring out its capabilities. Binger Hermann, in 1860, being then eighteen years old, opened a school for the instruction of the neighboring youths, it being the first ever established in the Coquille valley. A short time later we find him pursuing his profession of teaching in Yoncolla valley, and in Canyonville. Successful as a teacher, he was not satisfied with the inducements the pursuit offered, and in 1865 he turned to the profession of the law and began preparation for that arduous yet successful career which he has since followed. In 1866, he was admitted to the bar, and in the same year received his first civic honor in being elected to the lower branch of the legislature of Oregon. Shortly after, Mr. Hermann proceeded to San Francisco and entered the law office of Hon. John B. Felton, the great civil lawyer, and continued there his studies in jurisprudence. In 1868 he was elected joint senator for Douglas, Coos and Curry counties, and three years later was appointed by the president receiver of the Roseburg land office. In 1882 Mr. Hermann was elected to congress and continued in that position until 1897, when he was succeeded by Thomas H. Tongue, who was elected by a small majority. It was believed that Mr. Hermann would have been elected by a large majority had he been nominated, because of his indomitable energy in the legislative halls of his country, not only in matters of general importance, but his prompt attention to private business for his constituents, made him the most popular man in Oregon. The old soldiers of the war of the rebellion hold Mr. Hermann in high esteem because he has fought manfully for their right and sought justice for them at the capitol. The people of Coos county are proud of the fact that Mr. Hermann is a pioneer of their county, and they point with





pride to the improvements at the two harbors on our coast and consider them monuments to his name, as they were built during his services at Washington. For the purpose of recording the facts in regard to the services of Oregon's most energetic congressman we append some statements made by the press in January, 1892:

"Hon Binger Hermann has been at work in his usual energetic manner, which gives assurance that the interests of Oregon will be looked after. The following bills have been introduced, all of which have been recommended by the board of engineers, and approved by the chief engineer, Casey; to re-imburse the settlers and purchasers on the even numbered sections of public lands within the limits of the congressional grants in case of forfeiture of the odd-numbered sections; to provide life-saving stations at or near the mouth of the Nehalem river, Oregon, and for life-saving crews, etc; appropriating $100,000 for public buildings at Salem, Oregon; to provide for the establishment of a life-saving station at the mouth of the Siuslaw river, Lane county, Oregon, and for a crew thereat; providing for the commencement of the work on project prepared and recommended by the board of United States engineers for a breakwater at the harbor of Port Orford, Oregon, and appropriating $300,000 therefor; pensioning soldiers who served in the Indian wars; for a public building at Baker City, Oregon, to cost $3,000; the compensation of the registers of the land offices and receivers of public moneys in each land district; providing for an appropriation of $750,000 to be expended in continuing the improvements at the entrance of Coos Bay, Oregon, and further sum of $27,300 for the improvements of the inner harbor of Coos Bay by the removal of shoals and by dredging; appropriating $300,000 for improvements to Siuslaw river, Oregon; appropriating $50,000 for continuing the improvements at the mouth of the Coquille river, Oregon; and a further sum of $26,000 for improving the navigation of the upper Coquille river from Coquille City to the town of Myrtle Point, by obtaining a permanent channel of not less than four feet depth at low tide; appropriating $100,000 for the improvement of the entrance of Nehalem river, Oregon; appropriating $100,000 for the improvement of Tillamook Bay and bar, or particularly for the improvement of "dry stocking" bar by closing the dike of one of the channels of Hogquarton slough as the outlet thereof; also improving Junction bar and to obtain deep water to the sea by connecting north and south channels, by dredging a channel 200 feet wide at the bottom and six feet deep at low water; appropriating $165,000 for the improvement of the entrance of Yaquina Bay; appropriating $500,000 for continuing the work on the canal and locks at the Cascades of the Columbia river; appropriating $6,000 for improving the Willamette river above Portland, removing the snags, scraping the bars and deepening the channel way to the head of navigation, and in protecting the banks and avoiding the breaks at Independence, Salem, Corvallis, Harrisburg and other points on said river, and a further appropriation of $55,900 for improving the navigation at Ross Island, and the sum of $78,000 for improving the navigation of Clackamas Rapids, and a further sum of $5,000 for improving the navigation on the first bend above Corvallis and in the clearing of chute thereat." At the beginning of his administration President McKinley appointed Mr. Hermann to the very responsible position of commissioner of the general land office, and he now resides at the capital with his family.

In February of 1974 a subject of local interest emerged. Commercial and sports access to the Port of Gold Beach was nearly dammed off by the surfacing of a sand and gravel island between the harbor jetties.

Lots of talk resulted, both serious and in jest. Regardless of the conversation little material action could be taken by the Port Commission and the Corps of Engineers was on dead center. In order to draw some attention, the Gold Beach Rotary club decided to land and lay claim to the island. To insure success the attempt was made at low tide. I decided to make the whole thing even more legal, we should file a mining claim which was properly done and recorded in the county courthouse.

The press was put on notice and covered the project well during the entire occupation, which included planting trees, setting up a tent, posting mining claim notices, surveying the boundaries, providing law enforcement, and building an outhouse.

Besides the local Curry County Reporter the Rotary club made page one of the Southwestern Oregon area Coos Bay World and even managed the Portland Oregonian.

Not allowing the momentum to slow we created a subdivision plat, obtained title insurance, received a tax statement, and issued quicksand deeds for the lots to all comers.

What we sent to Washington, D.C. was politely acknowledged and eventually our treasured homestead disappeared under the attrition of wind, waves, and the Corps of Engineers.



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## Location Certificate - Lode Claim

STATE OF OREGON )
County of Curry ) ss.

Know All Men by These Presents, That Richard L. Larkin Ellensburg, Oregon Territory the undersigned, a citizen of the United States, or who has declared his intention to become such has this 6th day of Feb 1974, located and claimed, and by these presents do locate and claim by right of discovery and location, in compliance with the mining acts of Congress, approved May 10, 1872, and all subsequent acts, and with local customs, laws and regulations many linear feet and horizontal measurement on the basic lode, vein, ledge, or deposit along the vein thereof, with all its dips, angles and variations, as allowed by law, together with many feet on the principle side and nearly as many feet on the opposite side of the middle of said vein at the surface, so far as can be determined from present developments; and all veins, lodes, ledges, or deposits and the surface ground within the lines of said claim to many feet running opposite the principle from the center of discovery x and y feet running contrary from the center of discovery, all the way; said discovery on the ℄ being situated upon said lode, vein, ledge or deposit, and within the lines of said claim, in Jefferson Mining District, County of [redacted] Curry State of ~~Oregon~~ Jefferson described by metes and bounds as follows, to-wit:

A whale of a tract of land located in Curry County, State of Jefferson, sometimes known as Oregon, U.S.A. Consisting of acres adjacent to the City of Wedderburn, North of the incorporated City of Ellensburg, sometimes called Gold Beach. Those areas consisting of swamp, water, and roads are not to be considered.

Commencing at a heap of stone near where the boat landed and nearly a stone's throw from the end of a large rock about so oig.

Thence in a straight line along the lower peboles, approximately in line with the direction of the sun at 5 o'clock P.S.T. to a heap of driftwood adjacent to a large clam, now visible.

Thence in a different direction a long ways,(maybe somewhere South of an airplane flying low just beyond us), to a point opposite the boat that is directly opposite of us.

Thence parallel with the previous defined line, and diagonally opposite with the first described parallel, to a point opposite of a tent with adjacent facilities, to a squarish sort of a jog.

Thence in an equal contrary direction to a certain heap of stone about 2 boat lengths from the first of the last two boats now anchored.

Thence to the point of beginning which is to be determined by some skilled and competent surveyor.

Said lode was discovered Feb 6, 1974

Date of location Feb 6, 1974

Richard L. Larkin
Walter E. Schroder
Mark Cook & Co.
Donald C. Byrne
Larry W. Rammer
Locator.

*But not for long*

# New river island claimed by Rotarians

By SHARLENE NELSON
Correspondent, The Oregonian

GOLD BEACH — A new island at the mouth of the Rogue River has created some fun as well as problems.

The island appeared after the floods two weeks ago, according to Bob Strain, port manager. Made of sand and gravel washed down by the river, it stretches in a crescent shape on the ocean side of the jetties. About two acres in size, "it blocks the channel and is a hindrance to fishing boats," said Strain.

But the Rotary Club had different ideas about the island. The club said, "it appeared spontaneously." Wednesday, seven members boated to the island, hoisted an American flag and an Oregon flag, and claimed it.

They named it Rotary Island, noting they are the only Rotary Club to own an island. Then they planted trees, set up a tent, built a fire and had the new island surveyed by a registered land surveyor. "And they were all sober," said Strain.

Strain indicated that this was motivated partly in jest, but mainly to call attention to the need for removal of the island.

The Corps of Engineers has been notified. "They are surveying within the project depths and widths to restore the channel," said Strain.

When the island is gone, the Rotary Club will lose its new claim, but they won't be faced with prospects of a tax bill for waterfront property.

THE WHITE HOUSE

WASHINGTON

*The President appreciated your thoughtful message. I am pleased to express his thanks and to convey his best wishes.*

Roland L. Elliott

ROLAND L. ELLIOTT
SPECIAL ASSISTANT TO THE PRESIDENT

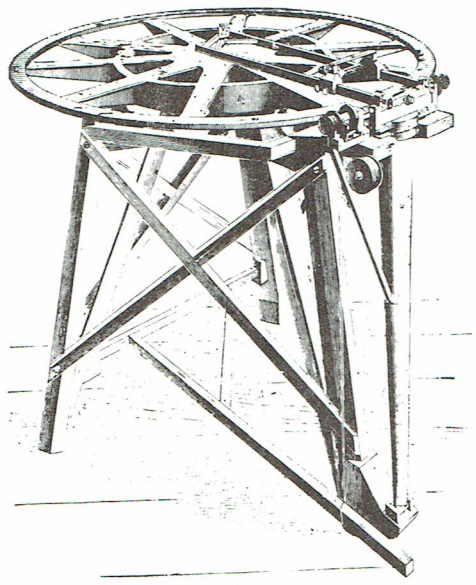
# Graduations

With the possible exception of the resolving power in the optical system, there is no consideration in the construction of an azimuth instrument so vital as that which relates to the division of the circle.

Our present accurate methods of sub-dividing the circle have come down to us by deliberate stages from the astronomers and navigators of antiquity. Olaf Roemer, who invented the astronomical transit in 1689, attached to it a full vertical circle in 1704 which he also graduated, according to the prevailing custom, by hand. In Smith's *Optics* (1738) and in the *Trans. Phil. Soc.* are contained descriptions of the manual methods used by Geo. Graham in 1725 and by John Bird in 1767, who were conceded to be the most notable manual graduators of that period.

Where the greatest accuracy was sought, only indifferent results were obtained until Tobias Mayer of Gottingen introduced the compound center and the method of repetition in 1752.

The invention of the automatic dividing engine by Jesse Ramsden of London in 1768 created a tremendous excitement in the intellectual world. His first engine, which is still preserved in the British Museum, stands there as a perpetual monument to his consummate skill as a mechanician of the first order.



Ramsden's First Dividing Machine

Although he curiously neglected to construct it upon a central axis of revolution, it is sufficiently important from every other consideration to induce us to insert here a cut of the engine* which he fashioned with his own hands.

The Automatic Dividing Engine, illustrated on page 8, represents one of those built, calibrated and corrected ** under the personal supervision of our Mr. Saegmuller, in which the error of spacing ranges between a vanishing nothing and two or three seconds.

It will be impossible on the smaller vernier-reading instruments to detect an inherent error of this size, particularly under the process of repetition in which a more formidable discrepancy might be entirely overcome.

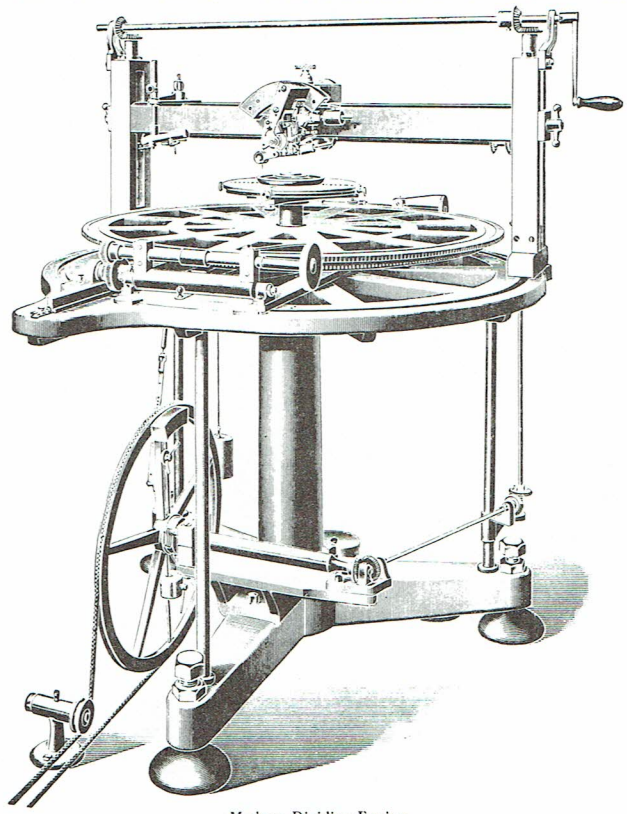
There previously existed an impression that any desired degree of accuracy could be attained by continued repetition; but it has been discovered that nothing is gained beyond certain limitations, due to systematic errors in the process of clamping successively from one axis to the other.

**From Report of Smithsonian Institute, 1890.*

***See Monograph by G. N. Saegmuller, U. S. C. & G. S. Report, 1879, pp. 192 etc.*



For the larger Theodolites and Meridian Circles, however, in which single seconds are to be observed by micrometer microscopes, this degree of accuracy must be still further corrected by our own select process, which Prof. J. G. Porter of the Cincinnati Observatory, after twenty thousand observations, has found perfect within four-tenths of a second.



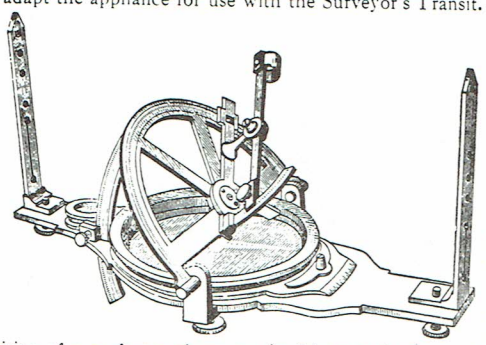
Modern Dividing Engine

By general consent, the polished surface of solid silver is regarded as a most satisfactory basis of graduation provided it can be kept from tarnishing under the influence of sulphurous gases, which permeate all atmospheres in the vicinity of industrial plants, coal or sulphuret mines or railroads. To overcome this defect we add a sufficient amount of nickel, which also produces an alloy of greater density and resistance, but in no instance do we attempt to graduate on brass and silver-plate the surface except in the case of our continuous variation plate, which is of secondary importance and is protected somewhat by the glass cover of the compass box.

We have prepared a series of illustrations showing five systems of numbering and nine systems of graduation. Any system of numbering may be applied to any system of graduation in connection with our Tachymeters or Theodolites; but our Transits are furnished uniformly with minute graduation and numbered exclusively as in System V.

mind. He presented to the engineering profession the sun's position in the solar system as an unchangeable reference from which the meridian might at all times be determined.

We insert herewith a cut of Burt's original instrument* as it was used up to 1851. Since that time there have been many modifications which might properly adapt the appliance for use with the Surveyor's Transit. The most popular one we illustrate in connection with Figure 043 p. 32. This design and method date back to 1867. The angular value of the sun's diameter being about 31′ 37″, it is necessary to center his image very accurately between the "time" and "equitorial" cross-lines at the opposite end of the lens-bar with a pocket magnifier. Some authorities are not highly impressed with the possibilities of a perfect performance in this operation†, or of setting off with precision the allowances for declination on the arc provided.



If an error of one minute in setting the proper declination can cause an error of twelve minutes in azimuth, the analogy that exists between the lens-bar and a sight-vane should be amplified in proportion when the telescope of the transit is substituted for the terrestrial sights of the compass.

In 1880 our Mr. Saegmuller began working on this proposition when he designed a small astronomical telescope of about 8-power with solar diaphragm and otherwise provided with a small bubble, so that, when applied to a transit telescope, corrections for declination and latitude could be laid off on the more accurately divided circles of the transit itself.

One of the first models‡ was submitted to the late Prof. J. B. Johnson of Washington University, who made upward of one hundred observations that induced him to report favorably upon its simplicity, its accuracy of pointing, the excellence of results and its reasonable cost.

We insert a cut of the improved model provided with a 12-power telescope and an arched connection between the standards of sufficient height to permit a maximum plus or minus declination of 23° 30′ to be laid off without interference.

The attachment is also illustrated in connection with Fig. 066 and may be applied to any of our instruments above the 4-inch or 4½-inch models. It has often been used for precipitous sighting in mines, in which case the small clamp-and-tangent operating on the polar axis serves for the alignment adjustment and the longitudinal bubble preserves parallelism of auxiliary sighting.

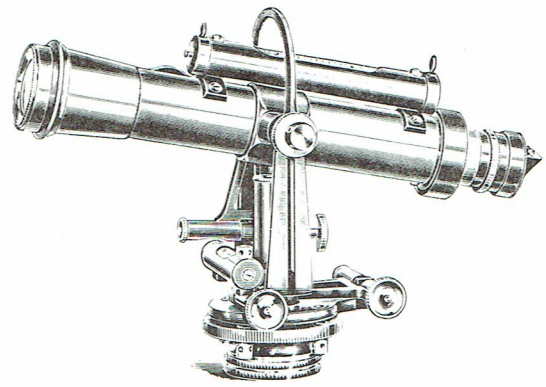
In this case, as in solar work, it is essential that the polar axis shall be adjusted to right angles with the line of collimation and the horizontal axis of the main

*History of the Solar Compass, John Burt, Detroit, 1878.

†See Baker's Surveying Instruments p. 63.

‡Patented May 3, 1881. Our patents No. 917799 of April 13, 1909 cover all the latest improvements.





Saegmuller Equatorial Solar Attachment
with Swivel Adapter Base.

**Price,** complete, with eyepiece prism, - - - **$51.50**

telescope. It is equally important that it shall be centered exactly over the intersection of these two elements and coincident with the vertical axis of revolution. We have provided for these requirements in our solar table, which is carefully centered before leaving our works.

The solar table is also adaptable for use with a vertical pillar supporting a top auxiliary telescope, as used for shaft surveys, or for slope stake work, as explained in the succeeding article. When not in use for either purpose, it is covered with a silvered disc, upon which is engraved a bulls-eye with three concentric circles for over-head plumbing. We shall furnish the centering target with any of our instruments without extra charge, when so requested, but when applied to instruments of other manufacture a charge of $2.50 will be made.

We publish annually a "Handbook for Engineers" containing the Ephemeris Tables, together with directions for using the solar attachment, which will be supplied gratuitously upon request.

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## Bausch & Lomb 10-inch Theodolite

### Schedule of Prices

| | | |
|---|---|---|
| *Nicho* | No. **1006** 10-in. Alt-Azimuth with 10-in. vertical circle, ½° graduations on solid silver, degree line on both limbs numbered, micrometer microscopes, x42, for both limbs reading to 1″; with 7½-in., 2″ chambered control bubble with glass encasement | **$960.00** |
| *Nilar* | Filar micrometer, 100 threads per inch, 100 divisions on drum | **40.00** |
| *Neore* | 7½-in., 2″ chambered striding level with glass encasement | **52.50** |
| *Niago* | Simplex diagonal eyepiece, x50 | **18.00** |
| *Nodal* | Extra orthoscopic ocular, x20 | **5.00** |
| *Noxic* | Axial perforation with electric dry battery | **22.50** |
| *Nicholas* | **Price**, complete as illustrated on p. 87 | **$1098.00** |

Where the observation of vertical angles are of less importance and do not require repetition, we are prepared to furnish a modification of this design with a somewhat less bulky superstructure and a 7-in. vernier-reading vertical limb according to the following schedule:

| | | |
|---|---|---|
| *Nichod* | No. **1016** 10-in. Alt-Azimuth with 7-in. vertical circle graduated to read to 10 sec. by double opposite verniers | **$575.00** |
| | Filar micrometer, diagonal eyepiece, one extra orthoscopic eyepiece and chambered striding level as listed above | **115.50** |
| *Natomas* | 2½-in., 20-sec. control bubble with tangent adjustment | **20.00** |
| *Nacosa* | Attached magnifiers for vertical circle | **15.00** |
| *Noxic* | Electric axial illumination | **22.50** |
| *Nichol* | **Price**, as described, without stand | **$748.00** |

## Bausch & Lomb 12-inch Theodolite

*"Geodetic"*

There is perhaps no other geodetic operation in which the choice of method, the instrumental perfection and the skill of the observer enter so directly into the results, as in the astronomical determination of the azimuth of a triangulation base.

The accuracy of the angle and base-line measurements and the strength of the figures, and not the length of the lines, are what determine the excellence of the work.

The primary triangulation of the United States has an average closing error of about 1″ per triangle, and the lines vary in length from about 4 to 180 miles. In the clear atmosphere of California with a telescope of 3-in. aperture and 60-power eyepiece, observations were made between two stations 192 miles apart. This is the record for length of sight in all geodetic operations.

We have constructed instruments with circles of greater diameter; but experience has shown that beyond 12 in. no further advantage can be secured in favor of accuracy; and it has also been determined that the process of continuous repetition, beyond certain limitations, induces cumulative errors of small amount.

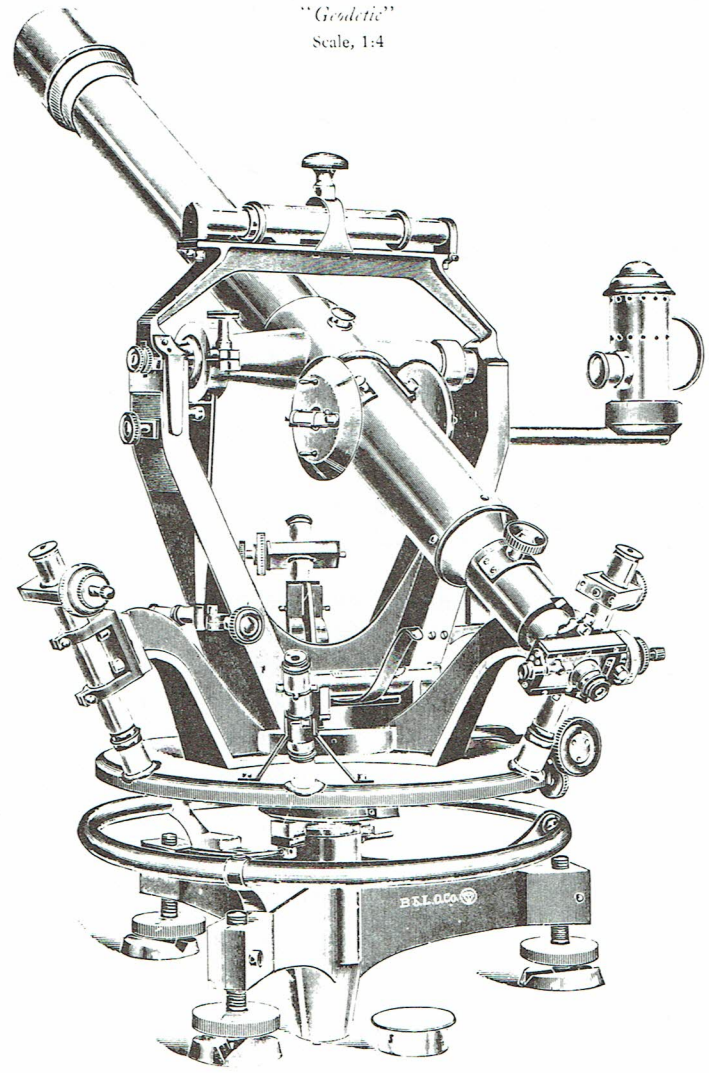
This instrument is made to order only, and we shall be pleased to furnish complete specifications on request. For further information regarding its use and construction, consult U. S. C. & G. S. report for 1894, pp. 265-274; 1897, p. 378, etc; also Breed & Hosmer, Vol. II, p. 35; Smith's revision of "Johnson's Surveying", p. 594; and "Gillespie's Surveying" by Staley, Vol. II, p. 37.



## Bausch & Lomb 12-inch Theodolite

*"Geodetic"*

Scale, 1:4




*Nabob* No. **1201** 12-in. Theodolite for primary triangulation.
**Price, complete as illustrated** without stand - **$1250.00**

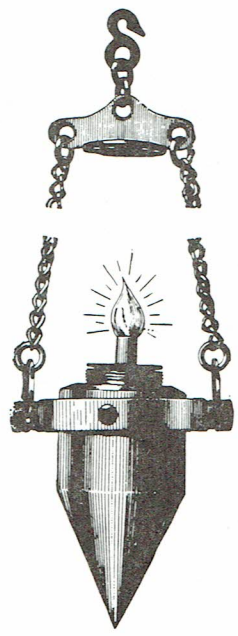
Specifications and further information on request.

I got a telephone call one evening in August of 1963, while attempting to enjoy my after dinner popcorn. It was from a person I never heard of. He claimed to own property above Illahe on Rogue river and wanted an estimate for a survey job. Somewhere in the conversation we arrived at a mutual agreement and I made plans to travel.

I had some leverage on the job since I had completed Schrader's trespass project in Section 16 and this new one was right next door and upstream in Sections 9 and 10.

Don and I loaded up the CJ 5 with the usual goodies. Then, over the usual wheel tracks through Bandon, Myrtle Point, Powers, and down to Illahe.

We got down to the sand about 2 p.m. after paying our respects to Ernie. You had to do that because you drove through his front yard to get to the boat landing. Thank God, Ernie was a friend.



Down on the beach in the Illahe sun we drew a temporary blank. All that was visible were three or four Rogue river boats with jackass lifts, partly filled with water in the stern. We had a caucus with the horseflies, turned the jeep around and parked in the 100° shade.

Neither of us was sleepy so we finally got out and toured the beach. We walked up the road a couple of hundred feet towards Ernie's and just below the road grade we found two guys up to their necks in blackberry vines.

They looked OK and we almost passed them by until we decided to strike up a conversation. We ate lots of blackberries, passed the time of day, and after awhile decided maybe one of these guys was the one we were supposed to work for. Tom and Glenn seemed to know what they were doing and we finally loaded up the boat and headed up-

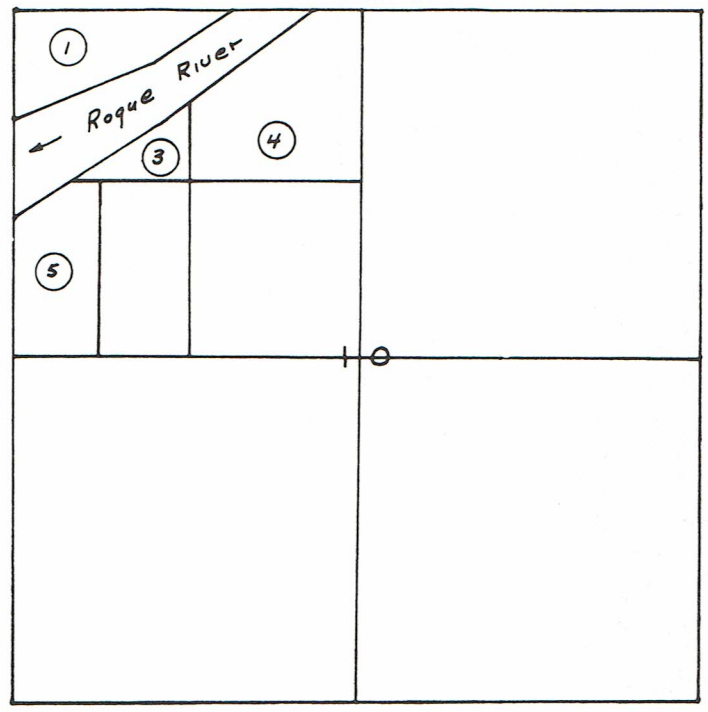


stream.

We arrived at Payton Place and Don and I hauled our gear up the bank and set up camp outside. Tom and Glenn retreated inside the cabin and before long we could smell dinner. It was perfect. Not dragging any weight and being unmeasured qualities, Don and I slept outside on the ground.

Later on we had some moments about Glenn because he was such a darn good boat pilot, cook, fisherman, and story teller. It wasn't until two or three days had passed that we realized we had the Rogue's most famous guide all to ourselves.

We pushed the lines out each day in the good old huckleberry which had managed to grow up through all the down and dead tanoak. Dead tanoak at this age needs a hacksaw, not an axe. Part of the job was to establish the boundaries of Lot 5 (Diagram 1.) which according to Wright's 1881 Government survey looked thus:

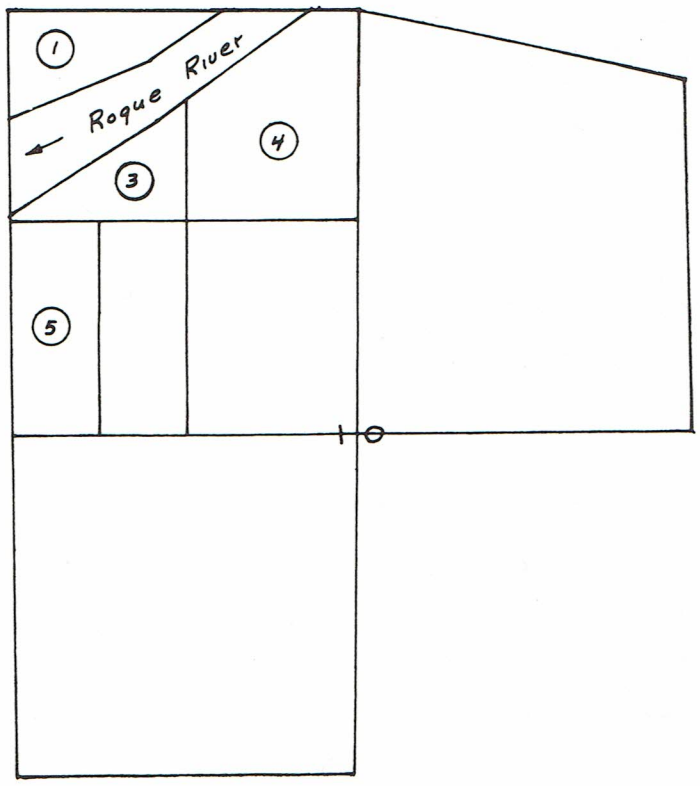


As it turned out from the measured retracements, with proportional distances, Lot 5 ended up as shown in Diagram 2.

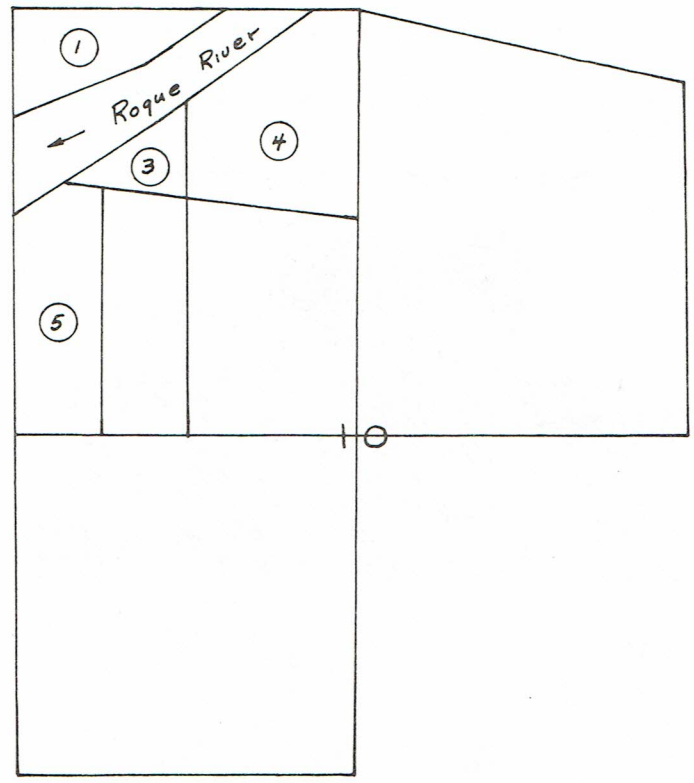
Lot 5 not having any river frontage bothered me to no end and client Tom even more. On top of that, the open field, orchard, and pioneer homestead weren't even on Lot 5.

I was curious enough to raise this question with the Bureau of Land Management in Portland, Oregon on November 22, 1963. (Alas, my birthday and the assassination of President Kennedy all the same day.) At the time, Tillman and Zirpel felt the proportion method was right but it raised enough doubt in their minds that they inquired to the Surveyor General in Washington, D.C.. Thanks to them the Broken Boundary Theory found its way to Curry county, Ore.

This method affected Section 10 only and provided a reasonable, legal means to satisfy and protect the interests of all parties and fulfill the intent of the original gov-






ernment survey.

Examination of Diagram 3 will show the configuration of Lot 5 as the end result of the Broken Boundary method. Lot 5 now has river frontage and 90 percent of the open ground, orchard, and homestead it originally occupied.

I think the highlight of the affair was the computations I did from time to time in the morning at the cabin. Brother bear would show up at the nuisance grounds at 10 a.m. after everyone had left and it quieted down. He would sit on top of the old tin cans like the king of the jungle and eat the left over breakfast hotcakes.

The bees, of course, disagreed on his ownership and buzzed in a swarm around his head. This was fatal for the bees because brother bruin would swing the hotcakes through the air with gusto and eat bees, hotcakes, and all with passion.

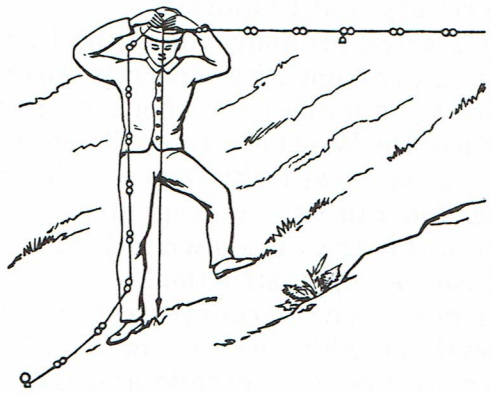
## Chapter I - Book of Genesis

In the beginning God created heaven and earth. This to my knowledge is the earliest reference to the Oregon-California line.

In my 20 years plus in Curry county there has not been a single year go by without some individual producing the well worn rumor of resurveying and changing the California-Oregon border.

I decided to research the record in detail, once and for all, and since I've accomplished that fact my blood pressure has been secure in matters related to this boundary.

After our creator produced heaven and earth, the United States of America and Spain decided to settle and terminate all their differences in North America by treaty and furthermore determine with precision the limits of their territories. The time, February 22, 1819. The principles of this construction were President James Monroe, John Quincy Adams, King Ferdinand VII and his Envoy Extraordinary and Minister Plempotentiary Lord Don Luis de Onis. The map on which the vital boundaries were delineated was prepared by Melishe's. The boundary line between Spain and the United States west of the Mississippi ran the course of the southern bank of the Arkansas to its source in Latitude 42° North and thence parallel of Latitude to the South Sea.



Mexico became independent of Spain in 1822 but reaffirmed the 42° boundary in 1828. It faded away as an international boundary with the proclamation of the treaty of Guadalupe-Hidalgo, July 4, 1848, extending American sovereignty to the lands lying south of the parallel. Two things happened fairly rapidly after that. On August 14, 1848, President Polk signed the bill establishing the Oregon Territory, bounded on the south by the 42° parallel of North Latitude from the continental divide to the South Sea (Pacific Ocean), and President Filmore signed the bill admitting California on Sept. 9, 1850.

Now a lot of paper work had been accomplished but very little of what had been said and recorded had ever been marked on the ground. The Modoc Indians claimed some land as tribal domain. The homesteaders didn't really know what land they owned or to which state or territory they belonged, and consequently paid taxes to the one that was to their best advantage.

Mining interests were involved when it couldn't be determined on which side of the line two principle areas, Sailor Diggings and Althouse, lay. The politicians got into it, naturally. William Waldo ran as Whig candidate for governor of California in 1853 and a portion of his votes came from Sailor Diggings and Althouse which eventually were found to be in Oregon.

In 1854 Seneca H. Marlette, California surveyor general, after eight futile attempts finally managed to engage Thaddeus P. Robinson, Klamath county (California) surveyor to make a try at establishing the line between the Oregon Territory and California.

Robinson started his endeavor at the U. S. Coast Survey Station in Crescent City, and ran north by traverse up the beach to an initial point about one third mile north of the mouth of the Winchuck river. From the initial point he turned to a course at right angles to the meridian, that is due east, and ran on the tangent to the parallel. An illustration of this trick is shown in Figure 3 in the 1902 Manual of Surveying Instructions.

Robinson described the country as once covered with a heavy growth of white cedar timber which has been swept down by fire and tornado and now lies in heaps upon the ground, which, together with the broken con-



tours on its surfaces and the half burnt manzanita and live oak brush, renders it almost impossible and entirely uninhabitable.

Robinson managed to run fifty miles inland before his funds gave out. His survey did settle the location of Sailor Diggings and Althouse. They were in Oregon. Whether Robinson had some misgivings about his line I don't know but he for some reasons set no monuments to perpetuate the location of his endeavor.

Actually Robinson picked a pretty good time to quit as the bloody Rogue River Indian uprising was beginning to gather momentum and it had very little to do with a petty argument between white men over a boundary location.

For some time Robinson's location of the Oregon-California line apparently was accepted without question. Some events on the Oregon side of the line tend to substantiate this. To more fully appreciate this on the local level we must retreat into the past and see what prompted the surveyors to enter into Western Oregon.

One reason was the Donation Land Claim Act. It was intended as a method of reward to settlers who would migrate to Oregon. It was first proposed in Congress in 1824 by John Floyd, a Virginia physician and friend of Thomas Hart Benton. His bill created a territorial government, provided for the military occupation of Oregon, and offered a grant of land to induce settlement. It passed the House but no action was taken in the Senate.

Successor to Floyd as protagonist for acquisition of Oregon was Lewis Linn, a senator from Missouri from 1833 to 1843. Linn's background was similar to Floyd's, both were physicians with frontier experience. Linn sponsored a series of bills to provide for the American advance into Oregon country again with the support of Thomas Hart Benton. Linn did not live to see his bills become law and seven more years passed before the Donation Land Act was passed in 1850. The Oregon area eventually named two adjoining counties in honor of Benton and Linn.

The principal provision granted 320 acres to any white settler (including halfbreed Indians) who was a citizen of the United States (or declared his intention by December 1, 1851) residing in Oregon at the date of passage or

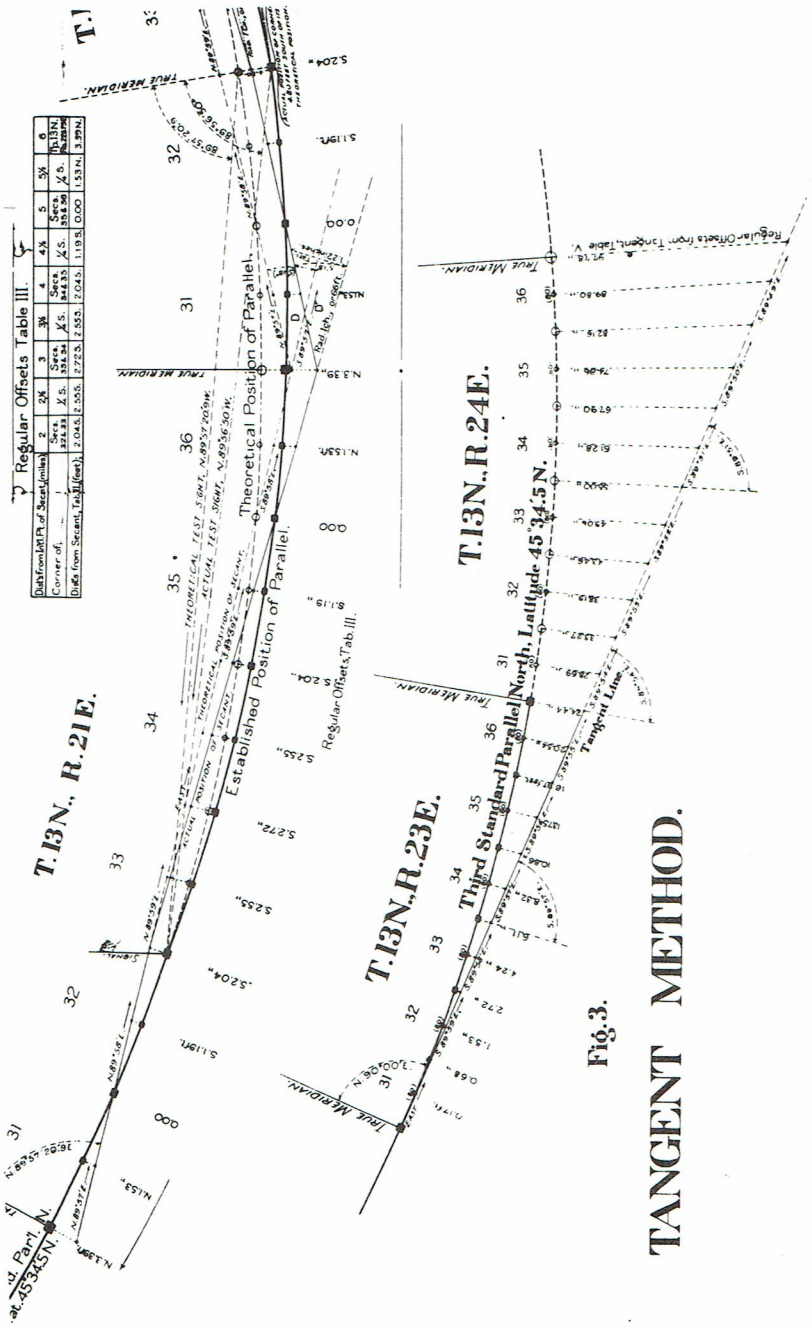



Fig.3. TANGENT METHOD.



arriving there by December 1, 1850, provided the individual would reside on and cultivate the tract for four years. A married man received 640 acres, one half to be in his wife's own right.

A grant one-half as large was made for those arriving in Oregon territory between December 1, 1850 and December 1, 1853, that is, 160 acres to a single man and 320 acres to a man and wife.

The Donation act also granted two townships, amounting to 46,080 acres west of the Cascades, one north and one south of the Columbia River, as support for a university.

Of the 29 men listed as early settlers and Indian fighters in Southwestern Curry County only seven took advantage of the Donation Land Claim Act. This bit of information is extracted from Orval Dodge in the Pioneer History of Coos and Curry County. What specifics are available on these gentlemen are listed as follows:

(1) Aug. F. Miller DLC # 37 322 acres
Born 1821 Germany
Married Sarah Oct. 1848
Arrive Oregon Sept. 1853
Staked Claim April 1854 - Affidavit J. W. Taggart
Run Ferry and public house 1853-1854
Present City of Brookings covers nearly all this claim.

(2) Hiram Tuttle DLC # 38 161 acres
Born 1832 Michigan
Arrive Oregon May 1853
Staked Claim June 1855 - Affidavit
Christian Tuttle
Thomas Van Pelt
Thomas J. Sharp
James W. Taggart
Indian War - Private March 1856 - Period served 1 month 19 days
Chetco Mobile Estates is on this claim
Victor pg. 635 - 1894

(3) Christian Tuttle DLC # 39 153 acres
Born 1827 Michigan
Arrive Oregon July 1853
Staked Claim August 1853
Affidavit - Thomas Van Pelt
Indian War 3rd Sergeant - March 1856
Period served 1 month 19 days
Benham Lane divides this claim and that of James W. Taggart #40
Victor - pg. 635 - 1894

(4) James W. Taggart DLC # 40 160 acres
Indian War Private March 1856 - Served 4 months 10 days
Benham Lane divides this claim and that of Christian Tuttle
Victor - page 635 - 1894

(5) Thomas Sharp DLC # 41 159 acres
Pedrioli Drive intersects Ocean View Drive within this claim

(6) Edward Laughlin DLC # 42 317 acres

(7) Robert S. Johnson DLC # 43 160 acres
Leslie Woodruff bulb farm was located on this claim now owned by A. E. Anderson.

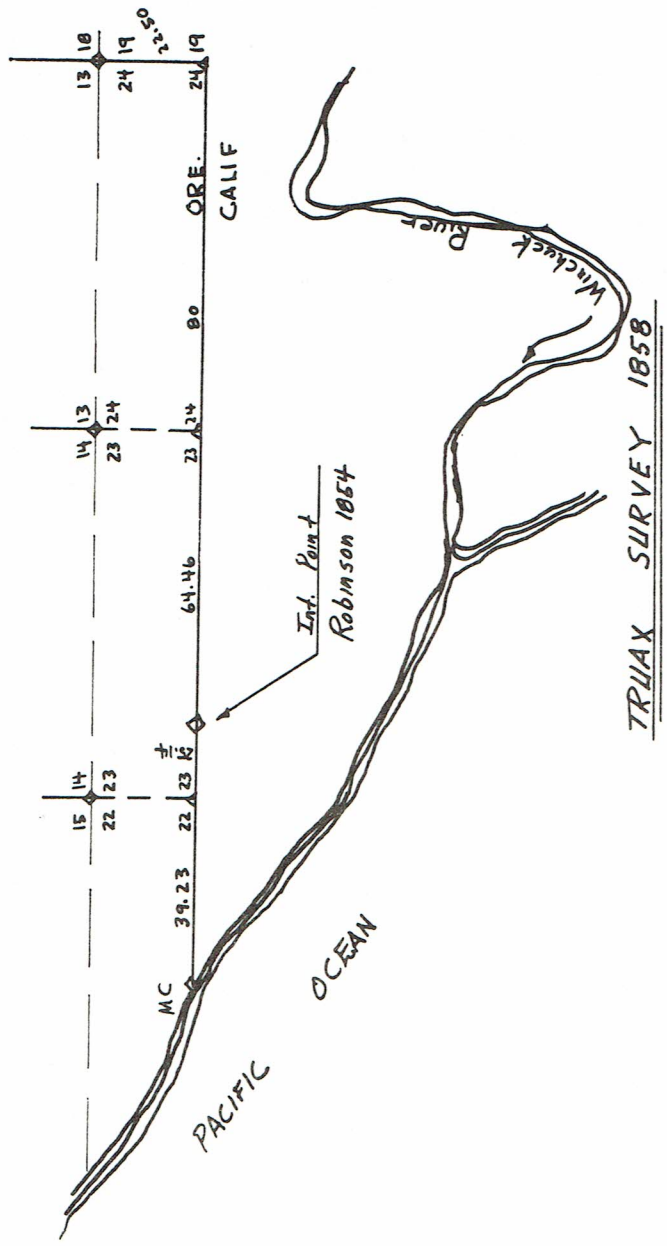
Two gentlemen fulfilled the surveying requirements for these Donation Claims during 1857. They were the brothers Daniel and M.O.C. Murphy. I have no other information on the brothers other than their survey fieldnotes and plats. Of all the area government survey contractors their work is the most reproducible and whatever errors they made are consistent. This can probably be blamed on the equipment and terrain more than anything else.

While the Murphys took care of the Donation Land Claims in southern Curry county, it was Sewall Truax who carved out the first coordinate portion of the public land surveys in this area. Truax was born in Canada and



was listed in the U.S. census of 1855 as being 25 years old. This information comes from the Jacksonville Museum, Jacksonville, Ore., which also has him down for Jackson county's first county surveyor. Some of the not so familiar names for coastal brush he brought along were hissup, jack oak, lilac, whortle, chinquapin, balm, and spice.

Truax, no doubt, had information on Robinson's survey for when he brought his line down to Robinson's effort he had no questions about hooking up and using it for the Oregon-California line. The following fieldnotes and sketch show how it was done in 1858:






Thence South between Sections 19 and 24. Chains 22.50 Intersect the California Line and set a Post for Corner of Fractional Sections 19 and 24.

Thence at the Corner of Fractional Sections 19 and 24, where the Coast Meridian intersected the California Line.

I then run West, on the California Line.

80.00 chains Set Corner to Fractional Sections 23 and 24.

23.26 chains A Post marked 1/4 S on the California survey.

40.00 chains Set quarter Section Corner; Drove a charred stake and raised a mound of earth, as per instructions.

64.46 chains Initial point of Robinson's survey of the California Line.

80.00 chains Set Corner to fractional Sections 22 and 23, in prairie; drove a charred stake and raised a mound of earth, as per instructions.

West, on the California line on South boundary of Fractional Section 22.

9.00 chains Road, to Crescent City NNW and SE.

39.23 chains Intersect shore of the Pacific Ocean and Set a meander Post. Drove a charred stake and raised a mound of earth, as per instructions.

Things apparently lay dormant until March 2, 1867 when the United States Congress passed an act to survey the Oregon-California line between the 120th Meridian and the Pacific Ocean. Joseph S. Wilson, commissioner of the General Land Office, entered into a contract with Daniel G. Major to do the job.

Major came with pretty high powered survey credentials; 46th parallel between Oregon and Washington Territory and meridional boundary between Idaho Territory and Oregon. He signed the contract in Boise City, Idaho Territory but assembled his equipment in San Francisco, California before moving to Camp Bidwell in Nevada for a long series of solar, lunar, and celestial observations.

A fine detailed article on the entire line is found in the Oregon Historical Quarterly March 1971.

Mileposts were the monuments set on the boundary line and were not common to section or quarter section

corners of the public land surveys. These monuments or memorials consisted of flint quartz, marked trees, willow stakes, glass stopper, quantity of bones, white glass jar, charcoal, iron heel, wood stakes, charred stakes, mule shoes, marking iron, marked stones, juniper cuttings, tin box, deer's head, deer horns, empty cartridge shells (usually within a mile or two of the deer head or horns), eight champagne bottles (usually flanking or lying near four of the five roads crossed), one white glass pop bottle, eleven black glass bottles, one black glass bottle marked USA Hospl. Dept., and last but not least the spinal link of a whale entombed at the extreme Western end of the line. Major's line measured 212.35 miles long.

Upon Commissioner Wilson's approval of the returns, Major's line became an official survey subject to legislative approval by Congress and the States of California and Oregon. No such legislative action seems to have been taken, and the line has been recognized as the boundary through these some 100 years of implied acceptance.

Only one of Major's many stations is exactly on the 42nd geodetic parallel, MP 184 ½, though his marked courses crossed the line at four places. However, how closely the "zigs" counterbalanced the "zags" is shown: Area gained by California 21,242 acres; Area gained by Oregon 22,951 acres.

It remained for J. C. Tolman, deputy surveyor, under Contract No. 199 dated July 22, 1873 to decide that in consequence of losing much time in tracing the lines and looking up the old corners of the previous survey which are now almost obliterated and the threatening appearance of the weather, it being so late in the fall season, I determined to correct the survey and correct this Township with the State Line only so far east as would include the settlements.

80.00 Set post for Corner to Sections 23, 24, 25 and 26 South, on a true line between Sections 25 and 26.

32.22 Intersect State boundary as established by Daniel G. Major, astronomer in 1870.

This connection with the state line is made 30.18 chains east of a monument near the coast on the State Line (the nearest monument I could find). Marked on the east side



212 M 28 C.

To further verify the acceptance of Major's Oregon-California Line A. H. Cleveland under Contract 350, May 1880 indicated in his notes the following:

Beginning at Corner of Sections 18, 19, 13 and 24, as re-established from Section work, I run South, on true line between Sections 19 and 24.

22.50 Corner on Old California State Line.

80.00 Set post at Corner to Sections 19, 24, 25 and 30.

32.26 Intersect State Line between Oregon and California.

Last but not least:

Resurvey of the Oregon-California State Line from the Pacific Ocean to the 192 mile corner by Fred W. Rodolf and Aubrey H. Bond. Survey commenced May 6, 1915.

I commence at the 212 mile 28 chain 32 link corner, which is a Port Orford cedar post. (This is not the original post established by Deputy Major.)

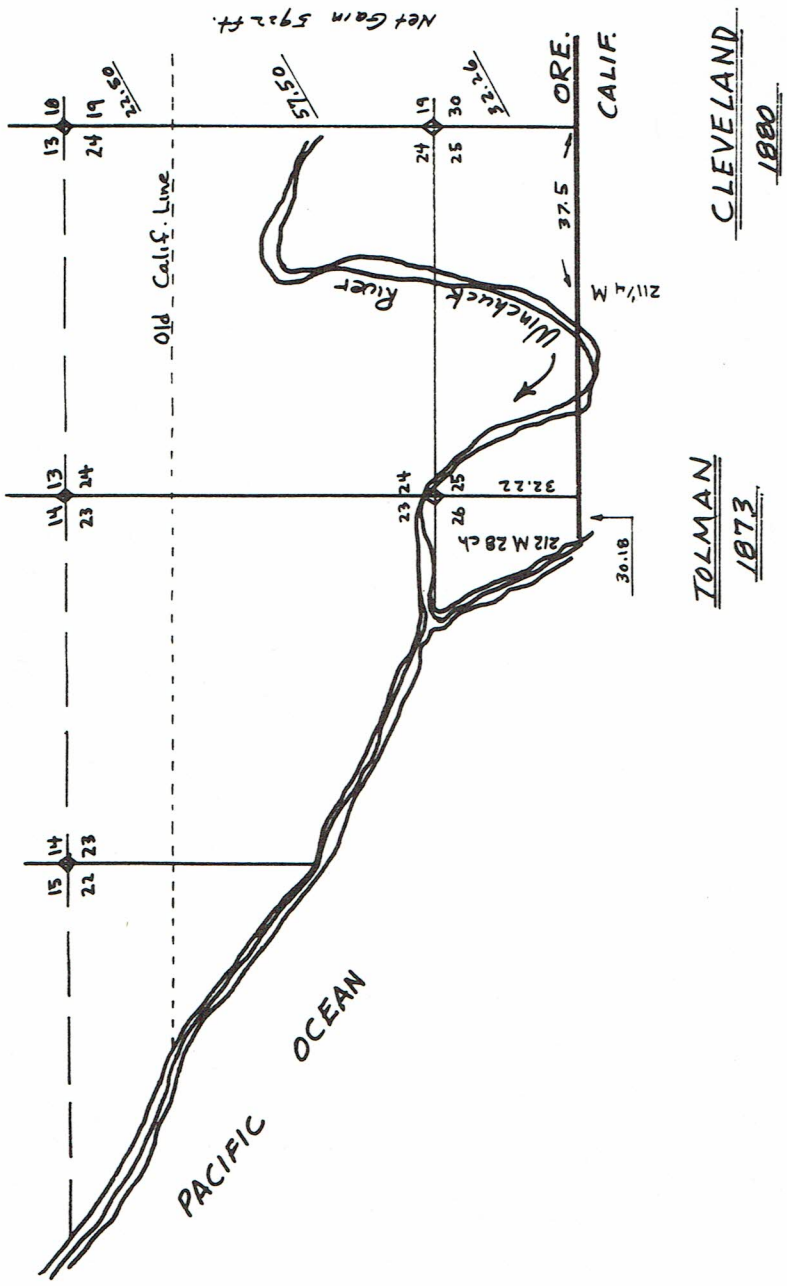
I re-establish the 212 mile 28 chain 32 link corner. Thence I run on a true line East.

0.01 chains or 7 feet Fence bears North and South across front yard of house.

0.50 chains or 33 feet Enter front door of house, occupied by John White.

0.94 chains or 62 feet Leave house, cross open field used as sheep pasture.

And so that takes us into the east on the last government retracement in Curry county.



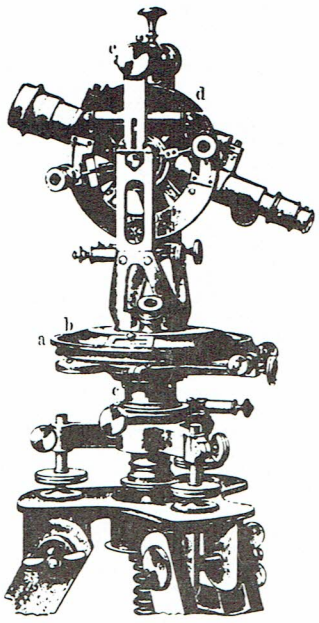




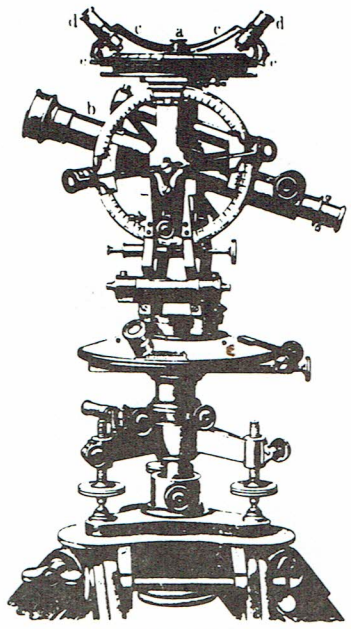

**Theodolit** (hierzu Tafel »Theodolite und Universalinstrumente I u. II«; ein von englischen Schriftstellern im 16. Jahrh. verstümmeltes Wort arabischen Ursprungs), das für die Geodäsie wichtigste Instrument zum Messen von Horizontalwinkeln. Es besteht aus einem Metallkreis, dessen Rand (Limbus) die Teilung in 360° (alte Teilung), bez. 400° (neue Teilung) trägt. Zentrisch zum Hauptkreis und an vertikaler Achse drehbar ist ein zweiter Kreis (Alhidaden- oder Zeigerkreis) vorhanden, dessen Rand die Nonien zum Ablesen der Horizontalwinkel trägt. Der Alhidadenkreis trägt zwei Lager für ein um eine horizontale Achse drehbares Kippfernrohr. Die horizontale Lage der Achse und der Kreise wird nach Libellen durch Stellschrauben, deren Füße auf der Stativplatte stehen, herbeigeführt. Man unterscheidet einfache Theodolite, bei denen nur der Alhidadenkreis drehbar, und Multiplikations- (Repetitions-) Theodolite, bei denen auch der Hauptkreis drehbar ist. Letztere gestatten ein Vielfaches des Winkels zu bilden, aus dem durch Division der von Ablesungsfehlern befreite Winkel erhalten wird. Zur Erhöhung der Genauigkeit der Ablesung werden bei größern Instrumenten Mikroskop-Mikrometer statt Nonien angebracht. Wird mit dem T. auch ein Vertikalkreis verbunden, der die Messung von Höhenwinkeln gestattet, so heißt er Universalinstrument oder (besonders bei größern Dimensionen) Altazimut. Solche Instrumente finden in der Astronomie und Geodäsie vielfache Verwendung. Fehlt der Horizontalkreis und dient das Instrument nur zur Messung von Höhenwinkeln, so wird es Vertikalkreis genannt. Ist an einem T. außer Vertikalkreis eine Bussole und ein distanzmessendes Fernrohr vorhanden, so heißt er ein Tachymeter (Schnellmesser). Ein ähnliches Instrument war der jetzt nicht mehr benutzte Katersche Kreis.

Fig. 1 der Tafel II zeigt einen einfachen T. von F. W. Breithaupt u. Sohn in Kassel. Der Hauptkreis a von 10—12 cm Durchmesser ist mit dem Untersatz b fest verbunden; drehbar ist der Alhidadenkreis c samt dem Fernrohr d und dem Vertikalkreis e. Die Horizontalstellung von a erfolgt an den Stellschrauben f des Dreifußes g, der auf dem metallenen Stativkopf h aufsteht. Mittels der Stangenschraube i und der stark gepreßten Spiralfeder k wird der T. nach vorherigem Zentrieren auf dem Stationspunkt festgehalten. Bei der Winkelmessung werden mit dem Fernrohr d beide Winkelschenkel nacheinander einvisiert und die jedesmalige Angabe am Nonius l abgelesen. Die Differenz beider Ablesungen ergibt den gesuchten Winkel. Das scharfe Einvisieren wird mit Hilfe der Feinstellschrauben m, die Horizontalstellung unter Beobachtung der Dosenlibelle n und der Röhrenlibelle o herbeigeführt. Beim Multiplikationstheodolit (Tafel I, Fig. 1) ist sowohl der Hauptkreis a als der Alhidadenkreis b durch Zapfen in der Zentralbüchse c drehbar. Hierdurch können beide Kreise vor dem Einvisieren des ersten Winkelschenkels auf Null eingestellt werden. Durch mehrmaliges Messen in beiden Lagen des Fernrohrs kann ein beliebig großes Vielfaches des Winkels gebildet und durch Division der mittlere Wert des einfachen Winkels gefunden werden. Die Nullstellung des Vertikalkreises wird durch die Röhrenlibelle d, die horizontale Lage der Drehachse des Fernrohrs durch die aufsitzende Reiterlibelle e kontrolliert. Fig. 2 der Tafel I zeigt einen Magnettheodolit von Tesdorpf in Göttingen, der auch als Tachymeter brauchbar ist. Auf der Fernrohrachse steht eine abnehmbare Bussole a, deren hochkantig auf einer Pinne schwingende Magnetnadel an beiden Enden schräg geneigte dünne Aluminiumplättchen trägt, auf denen ein feiner Indexstrich eingezogen ist. Am äußern Rande des Bussolengehäuses befindet sich eine Kreisteilung, deren Nullinie in der Visierebene des Fernrohrs b liegt. Zentrisch zur Teilung ist im Glasdeckel der Bussole ein drehbarer Arm c angebracht, der auf jeder Seite je ein kleines Einstellmikroskop d und darunter die Nonien e trägt. Die Mikroskope werden auf die Indexstriche der Magnetnadel eingestellt und die Streichwinkel an den Nonien auf Minuten genau abgelesen. Für astronomische und geodätische Beobachtungen geeignete transportable Universalinstrumente zeigen Fig. 3 und 4 der Tafel I. Bei Tesdorpfs Instrument (Fig. 3) hat der Horizontalkreis a 35 cm, der Vertikalkreis b 30 cm Durchmesser, die Schraubenmikroskope c, c geben direkt 1 Sekunde an. Das Objektiv des exzentrisch liegenden Fernrohrs e hat eine Öffnung von 54 mm und eine Brennweite von 65 cm. Die Teilkreise a und b sitzen auf Reibung auf den Achsen und können gedreht werden, um denselben Winkel an verschiedenen Stellen der Teilung zu messen. Auf der Drehachse des Fern-

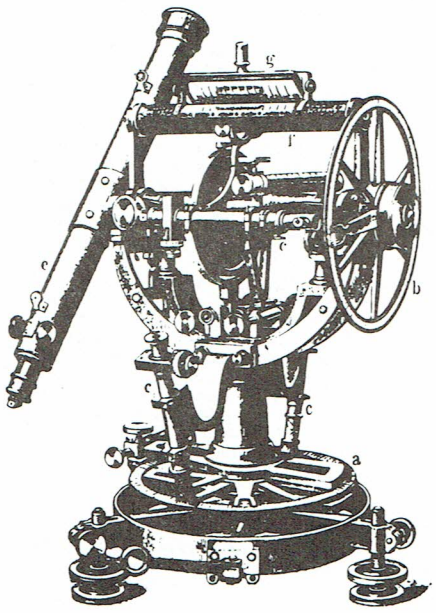
# Theodolite und Universalinstrumente I



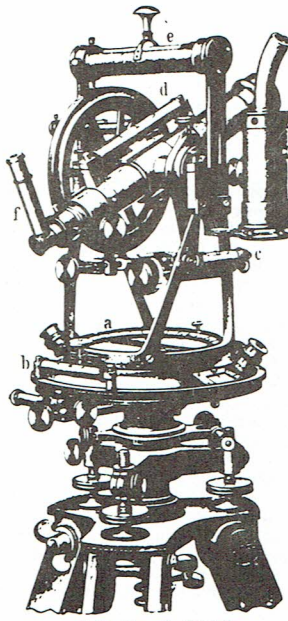
1. Multiplikationstheodolit.



2. Magnettheodolit von Tesdorpf.



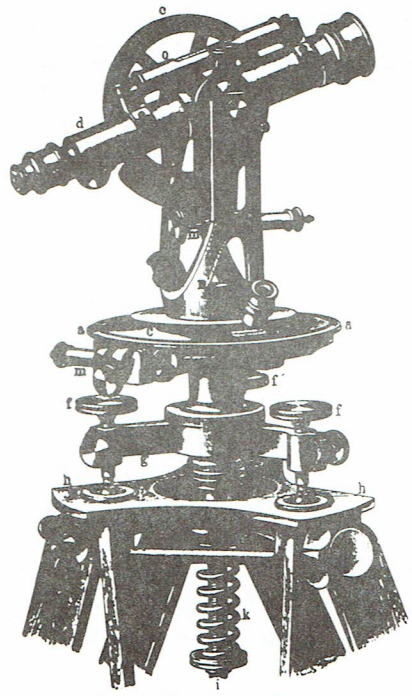
3. Universalinstrument von Tesdorpf.



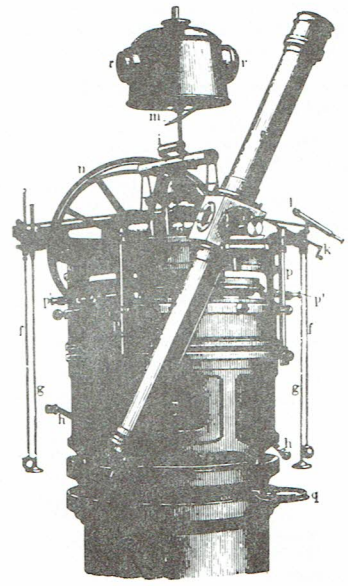
4. Breithaupts Transit.



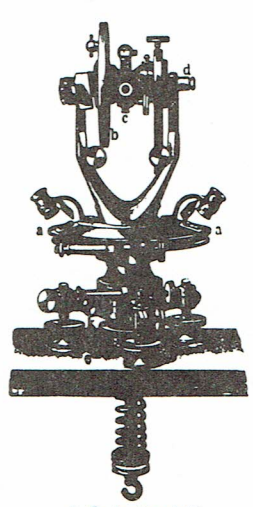
# Theodolite und Universalinstrumente II.



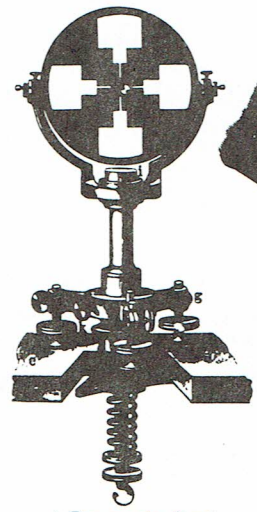
1. Einfacher Theodolit von Breithaupt.



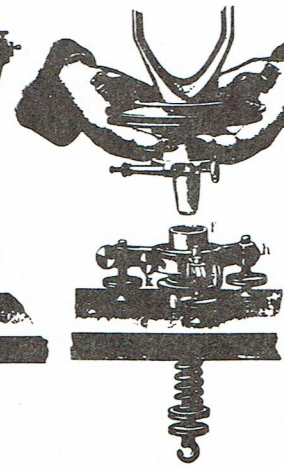
2. Altazimut der Straßburger Sternwarte von Repsold.



3. Grubentheodolit.



4. Transparentes Signal.



5. Steckhülse.

3–5. Grubentheodolit von Breithaupt.

rohrs steht eine durch Tuchumhüllung geschützte, empfindliche Röhrenlibelle f, deren Angabe im Spiegel g beobachtet werden kann. Breithaupts Transit (Fig. 4) ist ein größerer Multiplikationstheodolit, Horizontalkreis 20 cm, Vertikalkreis 14 cm Durchmesser, die mit Nonien auf 10 Sekunden abgelesen werden. Die Bussole a liegt zwischen den Fernrohrträgern. Die vier Libellen b, c, d, e gestatten eine sehr scharfe Einstellung. Um steile Visuren und Zenitbeobachtungen ausführen zu können, ist das Okular f gebrochen. Die Beleuchtung des Fadenkreuzes bei Sternbeobachtungen während der Nacht erfolgt durch die Lampe g. Kleinere transportable Universalinstrumente versieht man häufig mit einem gebrochenen Fernrohr, indem die untere, nach dem Okular hin gelegene Hälfte des Rohres zugleich die eine Hälfte der horizontalen Drehungsachse bildet; in der Verlängerung der obern Hälfte ist lediglich ein Gegengewicht angebracht. An der Brechungsstelle ist ein Prisma eingesetzt, das die vom Objektiv kommenden Strahlen total reflektiert und unter einem rechten Winkel ablenkt. Das Okular und das Auge des Beobachters befinden sich bei dieser Anordnung immer an derselben Stelle, am Ende der Drehungsachse, was sehr bequem ist, namentlich für Beobachtungen in großen Höhen. Größere Universalinstrumente für astronomische Beobachtungen werden fest aufgestellt, wie das Altazimut der Straßburger Sternwarte von Repsold in Hamburg (Tafel II, Fig. 2). Auf dem Pfeiler a erhebt sich ein eiserner Zylinder b; die obere Hälfte c desselben trägt die in zwei Lagern ruhende Stahlachse d und das dazu senkrechte Fernrohr e und ist um eine vertikale Achse drehbar; man kann daher das Fernrohr, da es auch um die horizontale Achse drehbar ist, auf jeden Punkt des Himmels richten. Die genaue Einstellung und Klemmung des Fernrohrs erfolgt durch die Schlüssel f, g, die auf feine Schrauben wirken. Zum Umlegen des Instruments dienen die Kurbeln h, zur Prüfung der Horizontalität der Umdrehungsachse das Niveau i, dessen Luftblase durch das Fernrohr l mit dem Spiegel m beobachtet wird. Der Höhenkreis n und der Azimutalkreis o wird mit Hilfe von Mikroskopen p, p' abgelesen. Der Nadirpunkt des Höhenkreises wird mit dem Quecksilberhorizont q bestimmt. Die Beleuchtung des Fadenkreuzes, des Niveaus und sämtlicher Mikroskope liefert die Lampe in dem großen Kessel r, die überdies durch die beiden Klappen r zwei Miren im Garten erleuchtet.

Der Grubentheodolit von Breithaupt in Kassel (Tafel II, Fig. 3) ist ein kleiner Repetitionstheodolit, dessen a und b 8 cm, mit kleinem zentrischen Fernrohr c; für starke Neigungen der Visierlinie kann ein zweites Fernrohr bei d auf die Drehachse aufgesteckt werden. Der T. erhält seine Aufstellung auf einer Spreize e und besitzt die eigenartige Vorrichtung der sogen. Steckhülse f (Fig. 5). Diese bedingt das Vorhandensein zweier weiterer Dreifüße g, h, die ebenfalls auf Spreizen aufgestellt werden. Der jeweilig mittlere Dreifuß trägt den Theodoliten, während die beiden äußern Dreifüße die transparenten Signale, deren eines in Fig. 4 dargestellt ist, aufnehmen. Diese werden von der Rückseite durch Grubenlichter beleuchtet. Da die Stellung des vordern Signals mittels der Dosenlibelle i bereits reguliert ist, so kann nach erfolgter Winkelmessung der T. nach Öffnen der Klemme k aus der mittlern Steckhülse herausgehoben und in die vordere eingesetzt werden (Fig. 5). Dieses Verfahren gestattet ein schnelles und äußerst scharfes Winkelmessen. Vgl. Jordan, Handbuch der Vermessungskunde (5. Aufl., Stuttg. 1904—07, 3 Bde.); Bauernfeind, Elemente der Vermessungskunde (7. Aufl., das. 1890); Fuhrmann, Die Theodolite (Leipz. 1896); Ambronn, Handbuch der astronomischen Instrumentenkunde (Berl. 1899, 2 Bde.).





Moore Mill and Lumber Company was forced into road condemnation across the Foster Brothers South of Edson Butte in Northern Curry County in the Fall of 1956. We got to survey the road location for the court case and get in a little camping on the job.

We researched the project for the necessary corner ties and found that William Wright had originally surveyed the Township in 1882 just after one of the big coast burns. More recent surveys by private practitioners were scattered and rumor had it that we were going to have to use a lot of imagination or find Wrights WeeGee board. The old subdivider must have had it pretty good because he was getting fourteen dollars per mile and according to his plat zipped through 62 miles, 14 chains and 51 links in 22 days.

Even though we were going to camp in the wilderness we figured on lots of company because a lot of ranchers, loggers, bullbucks, chairman of the board, lawyers, disinterested parties and cadastral crews were supposed to be around. Actually all we saw in the week we were there was a couple deer, a few sheep and some rats which is what this story is mostly about.

Before we left on the project we were given very specific details on how to get there. First you go up Highway 101 to a highway sign that says Willow Creek. If the trucks are coming out of the road North of the creek take that road. If not then return South of the creek and take the Grouselouse road. You'll know it because its shorter and steeper and doesn't have any gravel on it. Either way be sure and drive on the left hand side of the really steep grades because thats the way the log trucks come down but not necessarily pickups and bulldozers.

The Grouselouse road and the Willow Creek roads eventually come together just before the first cable gate, which has a sing with lots of bullet holes which by carefull study says Keep Out Tresspassers Will Be Prosecuted to the Fullest Extent of the Law along with some blue crayon words on the border that says something to the effect like Screw You.

Also be sure to take a hacksaw or a cable cutter because Moore Mill opens the gate plenty early but always locks it around 3:30 p.m. and the Fosters lock it any time they feel like it. Also you can be sure its the main gate because it has a higher density of

beer cans adjacent to it and if its late in the afternoon you will see a lot of damp puddles in the dust.

Keep on the traveled road until you get to the log landing but don't bother to ask anyone there where to go because they get there in the dark, in the morning, and don't know where they are anyway. Once you get to the landing look around and you will find a paper plate nailed on a stump. This locates where the old road goes to Edson Butte lookout. If its plugged up you can usually get the catskinner to open it. Keep on this road most of the way through a prairie until it forks. The one on the left goes to the lookout and the other goes down to the homestead where we are going to build the new road.

On the road down the hill you come to an old grader blade where you will cross a newly chopped line by the government surveyors which is way off. Keep on going a couple hundred yards and you will find a rusty yellow tag nailed on a rotten stump and Shorty says the corner is around there somewhere.

I guess we did pretty good for it was a little after 2:00 p.m. when we found the yellow tag on the stump. The section corner we wanted was something else and by 5:00 p.m. all we had found was a yellow jacket nest and some poison oak. We decided to go on down to the homestead and set up camp. There was a picket fence around most of it split out of Port Orford cedar.

The house was vacant and the front door adjar. Since it was getting dusk Shenie slipped on down the hill with his trusty 250-3000 to see if he could find some fresh liver for breakfast. The rest of us found the front room inside the house empty except for a two or three inch cover of sheep manure. There was a stairway going up so we checked that out and found a bedstead and springs. The bedstead was made out of cedar, the walls were paneled out of cedar, the shakes on the roof were made out of cedar, in fact the more we looked around everything was made out of cedar.

Downstairs the door leading to the combination dining room and kitchen was closed and wouldn't open so we went around the side of the house and looked in a window to see why. We couldn't get the sash open because the cedar house had settled on its cedar foundation and was no longer plumb. So we did what any other prudent person would do. We selected a cedar picket and broke the damn thing.

Once inside we found the kitchen door nailed shut with a cedar plank. On further examination we found cedar shelves,



cedar table and chairs and a cedar drainboard and sink. The sink had a cedar trough which went out through the wall into the backyard above the spring. The cookstove was made out of cast iron so we tested it out by building a fire in it.

We took down the plank holding the door shut and proceeded to move in. The front room didn't appeal to us and we didn't want to bother walking upstairs so we decided to move the bedstead downstairs and into the kitchen. No matter what position we assumed we could not get the darn thing down the stairwell or out the window. We took time out and assessed our position over a couple of beers and voted to widen the staircase. This was carefully accomplished with a sledgehammer and ax.

We paused in our moving efforts to conjur up a dinner, cooked over our rusty stove and soon sat down under the Coleman light for a bite to eat.

After dinner, in the quiet of the evening, except for the chirp of the crickets and rustling breeze through the broken window we carried on a conversation relevant to how ambitious and ingenious our former occupant must have been. In all our discussion we could only find one flaw with the house. For some reason, in order to get the stovepipe into the front room he had to come through the ceiling almost in the middle of the kitchen and by right angles through the wall into the living room. Since neither the stove or the pipe was around we didn't dwell on the subject further.

We decided it was time for bed so we finished installing the bedstead in the kitchen and rolled out the sleeping bags. Shenie then decided it was too crowded the way things stacked up in the kitchen so he took our shovel and graded himself a place in the front room.

Bathed in the moonlight filtering through the cracks and windows we settled down in our sacks for some much needed sleep. Pretty soon out in the front room the darkness was shattered with a burst of light. There was a helleva bang and we could see splinters floating down the stairwell. This prompted an inquiry from the kitchen group as to what might be going on and could we be of any assistance.

In return we were informed that we were not the only ones occupying space in this abode but were probably going to have to make arrangements to share it with a yet to be determined legion of pack rats.

We rallied around in the kitchen and located our flashlights and proceeded to load two pistols for further defense. However, all was quiet and as the smell of gunsmoke gradually drifted out the window we started to doze off again. Even though half asleep I still thought I could hear something rattling on the drainboard next to the head of the bed so I reached over for my flashlight. I don't think I got ahold of it the first time because as I remember it, it felt furry. Anyhow when it finally lit up I had an eyeball to eyeball confrontation with Mr. rat. His eyes were a shiney bright brown.

By the time I cocked the gun he had run up the wall and was peaking down through the hole in the ceiling from the kitchen chimney flue. I got off a kind of shakey shot and woke up the rest of the defense. He was sure fast on his feet because we spent most of the whole night trying to match up lead with fur. Somewhere around 3:00 a.m. we must have agreed on a truce because the next thing we knew sunlight was drifting in the window and the clock said 6:00 a.m.

Breakfast being consumed we spent a leisure day in the cool forest deeps and damps drafting a careful narrow survey line with transit and chain which would someday be widened with an enormous yellow bulldozer into a full blown dirty turnpike crowded with grissly powered desiel trucks belching blue smoke, eager to find a load of Douglas fir.

After three evenings of warfare the score was five to nothing in our favor. We seemed to be winning less interuptions in our sleep but on more careful analysis we found the war chest was dwindling and probably wouldn't last all week. Since it was a long trip out and not wanting to fight the gate we looked around for another solution.

Lee looking around for a possible variety in our diet amongst some old glass jars and rusty can goods upstairs stumbled on something that might work. It was a can of lye. This always worked, he said, during his trapping days when he lived alone in the woods. All you had to do was sprinkle it around in a circle on the floor. The rats would wander through and get it on their feet which would eventually start to sting and they would try to lick it off and this would cause severe gastronomical distress. Since most of the activity was upstairs we started the chemical warfare there.

After dinner we sat back and chuckled over our flanking movement in this phase of the war. Before long we heard some



noise. We sent up a search beam to see what it was, and there on the ceiling, in the cracks, was forming brown spots and in the center of those brown spots, drops of liquid which when they fell made one kind of noise when they hit the floor and another kind of noise when they hit the table. Of course they made no noise at all when they hit the sleeping bags, but unless immediately attended to with ample water produced holes.

To late the chemical engineer portion of my education flashed before my eyes and I remembered hydroscopic. Dry lye when exposed to air absorbs moisture from the air and dissolves.

Faced with this crisis something quickly had to be done. For all of us to retreat to the front room was to humilating and out of the question. Thank goodness the circle of lye, upstairs, was not to large in diameter. We determined this area of critical concern by measuring it with our galvanized wash tub, which we had found outside the day we arrived. Up until now it had been relegated to hold our trash. The bales were still on the tub so we merely had to nail it to the ceiling.

That night the rats did run through the lye and the next night they were gone. Upstairs was a battleground broken up with cedar splinters and broken glass.

The last day we were on the job my father arrived to see how we were doing. We found him in the kitchen, sitting in a chair, sampling a beer and gazing intently at the ceiling. We managed to contain ourselves until after dinner before we explained how we spent our Edson Butte evenings without television.

## A Simple Problem
## A WATER FILING ON ELK RIVER

In 1972 I prepared a water filing on a tract of land adjacent to Elk River in Curry County, Oregon. The water system was a single 3/4 inch plastic pipeline, the diversion a three foot diameter concrete tile buried 12 feet deep, adjacent to a creek, in a steep canyon draining into Elk River. Gravity sent the whole thing to the homestead.

The location was not difficult you merely worked your way up an old logging road over grown with alder, salmon berry, nettles, and blackberry. However in preparing the map for the filing some interesting conclusions had to be explained. First the diversion was in the Southeast quarter of the Southeast quarter of Section 1, Township 33 South, Range 15 West. The water applied for use was in the Southwest quarter of the Southwest quarter of Section 31, Township 32 South, Range 14 West. The only known monument was in the Southwest quarter between Sections 6 and 7 in Township 33 South, Range 14 West. The diversion was only 1400 feet North and 3700 feet West of the 1/4 Section corner between 6 and 7, Township 33 South, Range 14 West. Also Section 6 of Township 33 South, Range 14 West consisted of only 4 government lots. Oh well it was only a water filing.