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Item 26

REPORT ON THE

WHITE CAPS GOLD MINING COMPANY

BY

JOHN L. DYNAN

REPORT ON WHITE CAPS GOLD MINING COMPANY

-by-

JOHN L. DYNAN

February 6, 1934

SITUATION AND PROPERTY:

The property of the White Caps Gold Mining Company is at Manhattan, Nevada, 42 miles north of Tonopah, the railroad shipping point. The property consists of 8 patented mining claims and 7 unpatented mining claims, containing a total area of 177 acres. A map is attached showing the property and the important features of the surface geology.

HISTORY:

The first company to work the present White Caps ground was organized in 1906, and the first production was made in 1911. A cyanide mill was operated in 1913-14, and treated 19,909 tons containing $381,053.49 in gold. At about 150 feet below surface the oxidized ore changed to a base sulphide, high in antimony and arsenic, and the mill could no longer be used,

The company was reorganized in 1915, and development work actively carried on. A new mill of 100 tons daily capacity was started in September 1917, in which the ore was roasted before cyanidation. This mill was operated until January 1920, treating 59,056 tons of ore averaging $12.17 per ton, or $718,723.62 gross content. Of this $470,595.10 was recovered as bullion, a recovery of 65.5%.

During 1920 and 1921 development work was continued in the mine, reaching the 800 Level. During this period some arsenic rich ore was shipped to smelters, payment being received for both gold and arsenic content.

In 1922, after further tests of the ore, the mill was again started, and ran until early in 1924. During this period 39.277 tons were milled, averaging $11.28 per ton or $443.318.58 gross content. Of this $348,718.47 was recovered as bullion, a recovery of 78.6%. Since early in 1924 no ore has been milled. A reorganization and refinancing was effected in 1925.

Development of the mine was continued, reaching the 1300 foot level. Little work was done on this level, due to bad ground and the company's poor financial position. Shipments of higher grade ore to smelters were continued. At the end of 1931 company work was stopped and throughout 1932 and 1933 the mine was operated by leasers. 1933 was the most successful year the company has had, resulting in a profit of $10,000 from leasing operations.

A table is attached showing the production made by the mine in different years.

ORE MILLED

Year	Tons	Bullion	Gross Value
1911-5	19,909	No data	$381,053.49
1917-8	14,778	110,107.98	197,381.05
1918-9	32,862	234,597.44	323,249.12
1919-20	11,416	125,889.68	198,093.45
1922	11,754	94,032.30	125,376.40
1923	21,890	209,619.66	257,853.50
1924	5,633	45,066.51	60,088.68
	118,242		$1,543,095.69

ORE SHIPPED

1920	1498,418		$48,025.72
1923	242,343		11,190.38
1924	609,550		24,158.62
1925	83,047		2,328.72
1926	150,241		5,007.42
1927	5569,440		161,691.58
1928	5767,725		130,135.92
1929	4420,665		100,264.70
1930	3163,007		52,659.22
1931	1954,911		38,994.98
1932	4795,686		159,108.80
1933	6453,034		208,973.91
	34708,067		$942,539.97

TOTAL	152,950 Tons @ $16.25	-	$2,485,635.66

HISTORY: (Cont.)

Leasing operations, however can not continue indefinitely, as the best ore in the mine is mined out by the leasers with no adequate development work being done to find new sources of ore. Also, under leasing operations, with shipment of ore to Tonopah, freight to smelter, and treatment charges, amount to about $15 per ton, so only high grade ore can be mined. The only chance, therefore, for a really profitable mine is to develop ore bodies of such size as to warrant milling operations on the property, and to overcome and avoid the difficulties and mistakes that have made past operations unprofitable.

To do the development work required to search for such orebodies means that new money must be raised. The purpose of the investigation embodied in this report is to see if raising and expenditure of the necessary sums is warranted by the existing conditions.

GEOLOGY:

The geology of the Manhattan district has been studied by the United States Geological Survey. The results of their study are published as Bulletin No. 723. "Geology and Ore Deposits of the Manhattan District, Nevada", by Henry G. Ferguson.

The country around Manhattan consists of sediments, deep seated intrusions of granite and alaskite, and volcanic flows which in many places cover the earlier rocks. Faulting has been complex and the faults are numerous.

The sediments consist of shales, in many places altered to schist; quartzites; and limestones. In the White Caps type of ore deposit the ore is confined to the limestone. In the area here under consideration the most prominent rock formation is a schist of great thickness. This schist and interbedded limestones is called the Gold Hill formation. Three beds of limestone occur interbedded with this schist. They were mapped in considerable detail, during the apex litigation of 1917-18, and have been given local names. The lowest of the three beds is known as the Pine Nut limestone. It is an impure white limestone, up to 30 feet thick, and to date has been of no economic importance. Above it is about 150 feet of schist, and then comes the Morning Glory limestone. This consists of about 40 feet of white to blue gray crystalline limestone. This formation also, to date, has produced no ore, although it is indistinguishable in appearance, in most cases, from the ore bearing limestone. Above the Morning Glory limestone is about 200 feet of schist, with some interbedded quartzite.

On top of this schist is the White Caps limestone, which is the ore bearing formation. It is a pure, blue-gray crystalline limestone, up to 60 feet thick. Above this is an additional 2500 feet of schist containing some beds of quartzite, sandstone, and limestone.

At the base of the Gold Hill formation is a black shaley limestone known as the Zanzibar limestone. ?

GEOLOGY: (Cont.)

There has been movement on the contact, and according to Ferguson, this is a reverse or overthrust fault, the older rocks lying above the fault having been thrust up over the younger rocks below, so that the normal order of superposition is reversed. Ferguson calls this the Zanzibar overthrust fault. The dip of this overthrust is slightly flatter than that of the White Caps limestone, so they should intersect at 1800 to 2000 feet in depth. Ferguson suggests (page 113) that the solutions which deposited the ore may have come up along the overthrust until they met the White Caps limestone, then ascended through that formation along cross fractures. At the present time this is a theory only, but a theory that gives hope of the ore extending to considerable depth below the present bottom levels of the mine.

Large masses of granite and alaskite, intrusive into the Gold Hill formation, outcrop in the district, but so far have not been found in the workings of the White Caps mine. The volcanics have not been exposed either, although in a few places in the mine some highly altered rock has been considered as a possible dike rock.

This review of the formations of the district shows that from the economic standpoint the White Caps limestone is the one formation of paramount importance. This formation runs through your property for a length of 2000 feet, broken into smaller blocks by faults, as shown on attached map. It has been developed in the lowest mine workings, and from all available evidence should extend much farther in depth. This limestone strikes almost northwest and southwest, and dips to the southwest at angles varying fromm 20° to 60° averaging about 50°.

x East

The White Caps limestone also extends long distances through adjoining and neighboring properties. In the White Caps Extension, adjoining on the east, it has been traced for a length of 2700 feet. No ore was found in the small amount of work done on the property.

In the Manhattan Consolidated, which adjoins the White Caps on the west, the limestone extends for 1000 feet. In the Nevada Coalition, which is next west of Manhattan Consolidated, a length of 2700 feet of this limestone has been found. In these last two properties, ore has been found in a number of places. One shoot, of particular importance to the White Caps company, outcrops just west of the end line of your Pine Nut claim, about 1400 feet west of the White Caps shaft. The dips of the limestone block and its limiting faults are such that this ore shoot should be in the White Caps property on the 565 and deeper levels. This shoot is here known as the Consolidated Ore Shoot. The ore occurs as irregular masses replacing the limestone. The size of the oreshoots varies and may be as large as 180 feet by 30 feet in horizontal section, as on the 565 Level, East Ore Shoot of the White Caps mine. The limestone is cut, not only by the major faults, which displace the blocks, but also by numerous cross fractures, of little or no displacement. These trend quite uniformly about North 15 degrees East, and are vertical or nearly so. They appear to have had great influence in determining the position of ore shoots, for it is usually along these cross fractures that the limestone is mineralized. Where the fractures are numerous, and closely spaced, there is the best chance for a large and uniform ore shoot.

GEOLOGY: (Cont.)

Mineralogically, the ore is very complex, and it is this which has caused the past metallurgical difficulties, with poor extraction in the mill. The principal gangue minerals of the ore are quartz and calcite. The principal sulphides are pyrite, stibnite, realgar, orpiment, and arsenopyrite. No gold is visible and it is not known to a certainty how it occurs. The stibnite is practically barren. The character of the ore varies at different places in the mine. In places the ore consists of coarse white calcite, quartz, massive realgar and a little orpiment. Ore of this nature has contained up to 25% of arsenic. Another type of ore consists of very fine black quartz, replacing the limestone. Realgar is usually scarce in this ore, but stibnite is usually present, either in small amount or abundant. What arsenopyrite is present is in small amount, and usually requires the microscope for identification. The black quartz type of ore seems to be becoming more prominent as depth is gained, with diminution of the stibnite and realgar. This is in line with experience in other mines, as realgar and stibnite are generally accepted as shallow minerals.

MINE DEVELOPMENT

The ore mined to date in the White Caps mine has come from three main ore shoots, known as the East, Shaft, and West ore shoots, respectively. Each ore shoot is in a separate block of White Caps limestone, and these blocks are separated by large faults, as shown on accompanying map. The main shaft starts on surface in the schist, between the limestone blocks containing the East and Shaft ore shoots. This shaft has levels at 120,210, 310, 440, 565, 670, and 800 feet. The East ore shoot has been developed and mined on each of these levels. The Shaft ore shoot has been worked on each level down to and including the 565. The West ore shoot has been opened on the 310,565, and 800 levels.

Below the 800 level the mine has been developed by an incline shaft, sunk near the East Ore Shoot. Levels were run at 900, 1100, 1200, and 1300 feet. Of these, the 900 level only is now accessible. It has just recently been pumped out. Unwatering is still in progress and should soon uncover the 1100 level. On the 900 level, the East Ore Shoot was developed and mined. Many of the workings are now caved, so that the extent of the ore shoot can not now be determined. The maps also show the East Ore Shoot to have been developed on the 1100 and 1200 levels. On the 1300 level the map shows only a small amount of work, not enough to define the size of the ore shoot or limestone block. Shortly after the opening of this level, the incline shaft was abandoned and the pumps pulled, allowing all workings below the 800 to fill with water. It is only within the last few months that an effort has been made to unwater and reopen these levels. The only information available about this level is in the annual report of the Company for the year ended December 31, 1926. In this report it is stated that a crosscut southwest of the shaft penetrated an oreshoot which assayed about $50 per ton across a width of 34 feet. It also stated that this oreshoot dipped north and had no apparent connection with ore shoots on levels above.

Previous to abandonment of the incline shaft, the 1100 level was run westward for about 1500 feet. The first 600 feet of this was mapped and shows the presence of the White Caps limestone and the East Ore Shoot. The only

available on the western part of this level is from the mine foreman, who states that ore was developed on the West Ore Shoot. There are no figures available as to how much ore was shipped from these lower levels, from the incline shaft. The mill was not running while these levels were being worked, and ore mined had to be good enough to ship to a smelter. Under these conditions it is probable that a considerable amount of ore of milling grade remains on these levels.

ORE SHOOTS

The largest and most productive ore body in the mine has been the East Ore Shoot. This occurs in a block of White Caps limestone which outcrops 200 feet northeast of the White Caps Shaft. This limestone block is 350 feet long on surface, and is bounded on the northwest by the White Caps Fault and on the southeast by the East Fault, both of which faults dip to the southeast. The mineralized areas in this block, as developed to date, are as follows on the various levels.

310	level	3600 square feet in horizontal section
440	"	6000 " " " " "
565	"	5400 " " " " "
670	"	5500 " " " " "
800	"	2160 " " " " "
900	"	2100 " " " " "
1100	"	1500 " " " " "
1200	"	Unknown
1300	"	"

These mineralized areas are not all commercial ore. As depth is gained, the ore shoot pitches away from the White Caps fault and towards the East Fault, so that from the 440 level down the ore is against the East Fault. On the 1200, from a study of the map, it appears that the ore may have broken through the East Fault into the next adjacent block of limestone to the southeast. To have this condition, the displacement on the East Fault would have to be smaller here than it is on upper levels, so that the two blocks of limestone would not be separated. It may well be that on the 1100 also a part of the East Ore Shoot is in the block southeast of the East Fault, and that this accounts fore the smaller mineralized area on the 1100 as developed to date. This is a condition that should be carefully investigated when these levels are unwatered. If the East Fault is post mineral, as seems likely, then the East Ore Shoot should exist on both the northwest and southeast sides of the fault. Hitherto it has been on the footwall or northwest side. The condition noted above, on the 1100 and 1200 levels, seems to indicate it may there be, in part, on the southeast side. If so, in a few more levels it will probably be entirely on that side, in another block of limestone. There should then be nothing to hinder this ore shoot from going to much greater depth in its new limestone block. This may be of great importance to the future of the mine. It can be tested on the 1100 level at small expense by dutting through the East Fault and then running a crosscut northeast. One hundred feet of work may be enough to determine this.

The next ore shoot to be considered is the Shaft Ore Shoot. This is a small shoot, occuring in the block of limestone which outcrops 200 feet

ORE SHOOTS: (Cont.)

northeast of the White Caps Shaft. This block is 300 feet long on surface. It is bounded on the southeast by the White Caps fault, on the northwest by the Morning Glory fault, which strikes North 15 degrees East and dips 55° east, The mineralized area in this block is 1700 square feet on the 310, where there are two branches, and 1200 square feet on the 440 level. Just above the 500 level, this shoot cuts off against the Morning Glory Fault. The block of limestone will also cut off, coming to a point below the level in the angle between the White Caps and the Morning Glory faults. It appears unlikely that this shoot will go any deeper. There are still good chances for more intensive exploration of this limestone blodk to open more ore, as is, in fact, now being done by leasers, on the 565 and 310 levels.

On the 200, 310, and 440 levels this shoot is cut off on the west, not by the Morning Glory fault, but by a more steeply east dipping fault (70 degrees) known as the West Fault, which on its dip joins the Morning Glory Fault at the 565 level. On the 440 and levels above, there should be a block of White Caps limestone, between this West Fault and Morning Glory Fault. It should be displaced to the south where the Shaft Ore Shoot ends against the West Fault. It should be a productive block, as the blocks next east and west of it have produced good ore. This possibility can be easily tested, at small expense, by a raise or diamond drill hole from the 310 level.

The third shoot of importance is the West Ore Shoot. This occurs in a limestone block which outcrops in the gulch southwest of the White Caps Shaft. No ore shows in the outcrop of this block. It is bounded on the southeast by the Morning Glory Fault. On surface, proceeding west, the limestone is cut by numerous faults, and a very complicated condition exists. On the 310 level, however, there is a practically continuous block of limestone from the Morning Glory Fault westward for 500 feet. Most of the ore mined to date has come from an area within 200 feet of the Morning Glory Fault. In this area a shoot of ore has been followed from the 800 to about 80 feet from the surface. Leasers are still mining ore, much of it of exceptionally good grade. This block can also be observed on the 565 and 800 levels, where it has been productive. On these levels it is somewhat more disturbed by faulting. The 800 face can not be observed, as the drift is blocked by caving. On the 500, for 250 feet west of where ore has been mined, the limestone is well fractured. Right in the west face there is a strong fracture, showing mineralization, from which an assay of 0.40 ounce gold per ton was obtained.

There is every reason for believing this block will produce much more ore, both in depth below the 1100 level, and by more intensive development on upper levels. Also, there is no indication that its western limit has been reached, as the west face on the 565 looks promising. Drifting to the west from this point is a piece of work that can be carried out at small expense, and may have very important results. This drift should be advanced to the western limit of your property. In addition to the good looking present face, the Consolidated Ore Shoot, referred to above, should be picked up. It is about 700 feet, on the strike of the limestone, from this face to where the limestone will pass out of your property.

ORE SHOOTS: (Cont.)

We have now considered the three main ore shoots developed to date, and have seen that they occur in limestone blocks having a total combined length of 1150 feet. This leaves 850 feet of the 2000 feet of White Caps limestone traversing the property still practically unexplored. It is true there are no known outcrops of ore in these blocks, but there was no outcrop of the West Ore Shoot, which has been very productive. This additional length of limestone should be explored, preferably at a new and deeper level, such as 1500 feet.

SUMMARY AND RECOMMENDATIONS:

To sum up briefly, your property is traversed by 2000 feet of White Caps Limestone, exploration of 1150 feet of which to a depth of 1100 feet (1200 and 1300 levels excluded because of limited work) has developed three main ore shoots which have produced 152,950 tons of ore averaging $16.25 per ton, a gross value of $2,485,635.66. On account of poor metallurgical results and high mining and development costs, operations have nevertheless been carried on at a heavy loss, made up by assessments and refinancings. The question now is, do conditions warrant raising new money for further development of the mine?

After considering all the evidence presented above, it is my belief that the ore should continue to considerable depth below the present deepest workings. I also believe there are good chances to develop new ore shoots by further lateral exploration of the limestone. From the viewpoint of further ore supply I think there is no question of the advisability of continuing development.

The metalurgical question is beyond the scope of this report. There are few mines, however, where an adequate ore supply is developed, where satisfactory metallurgical treatment can not be worked out. The milling problem will be very much simplified, if, as seems probable, the arsenic and antimony continue to decrease in depth. It should also help if the mine is developed well ahead of mill requirements, so that a more careful grading and selection of ore to be sent to the mill can be had. Much trouble has been caused in the past by sending to the mill ore high in antimony and arsenic, made necessary by the demands of the mill for tonnage.

Costs of development should also be much less than in the past. The geology of the mine has been well worked out, and the position of the porductive limestone blocks located. I think much money could be saved by sinking small winzes on ore shoots, before driving long crosscuts to pick them up on new levels. In this way main levels could be spaced 200 or 300 feet vertically, and the expense of driving long crosscuts at 100 foot intervals saved.

Another factor of great importance is the new gold price. Practically all the mines production has been at the old price of $20.67 per ounce, the ore averaging about 0.78 ounce gold per ton. At the new price of gold, $35.00 per ounce, this same grade of ore is worth $27.30 per ton, which is an exceptionally good grade of ore.

It is my recommendation, therefore, that development of the mine be

SUMMARY AND RECOMMENDATIONS: (Cont.)

mntinued, a new level established at 1500 feet, and the limestone thoroughly explored at that depth, by drifting on the various fault blocks.from end to end, and crosscutting them wherever favorable fracturing is found. To do this, a new vertical underground sub shaft should be sunk from the 800 foot level. It should be so situated that if developments on the 1500 are favorable the shaft can be raised through to surface, coming out at a point favorable for a permanent mining plant.

In addition to this main campaign, there are many pieces of development work which should be done on the present levels. One of the most important is the westward extension of the 565 level, to pick up the Consolidated Ore Shoot and develop possible new shoots. On some level all the limestone blocks east of the East Fault should be prospected. The new shaft should be connected by a crosscut with the present 1100 Level workings and that level reopened. There is small doubt that considerable ore will be found on it. A winze can be started at any time to prospect the West Ore Shoot below the 800 level. This work can start on ore. The probable missing limestone block, between the West and Morning Glory Faults, on the upper levels, can be prospected for at small expense. In addition to these, there are many smaller development jobs that offer good promise of finding ore.

COST OF PROGRAM:

This work can be done with the company's present equipment, except for such small tools and supplies as may be needed. The double drum hoist now at the head of the incline can be moved to the new vertical shaft. The greatest element of uncertainty is the amount of water met in sinking, whaich is not likely to be great, as the present unwatering operations will soon have the water below the 1100 level.

A tentative estimate of the cost of doing this work is as follows:

Sinking 3 compartment Vertical Shaft, 800 to 1500 level, and 100 foot sump, Total 800 feet shaft sinking	$60,000
2000 feet drifting on 1500 level	20,000
1000 " crosscutting "	10,000
2 Raises on Limestone, 1500 to 1100 Levels, 1500 feet	20,000
Hoist station, Sheave Raise, etc. on 800 Level	5,000
Crosscut to new shaft site on 800 level	5,000
Lateral development on present levels	20,000
	$130,000

I believe the expenditure of this sum is warranted, and recommend that it be raised, and the above program of development carried out. It should develop an ore reserve adequate to put your property on a paying basis.

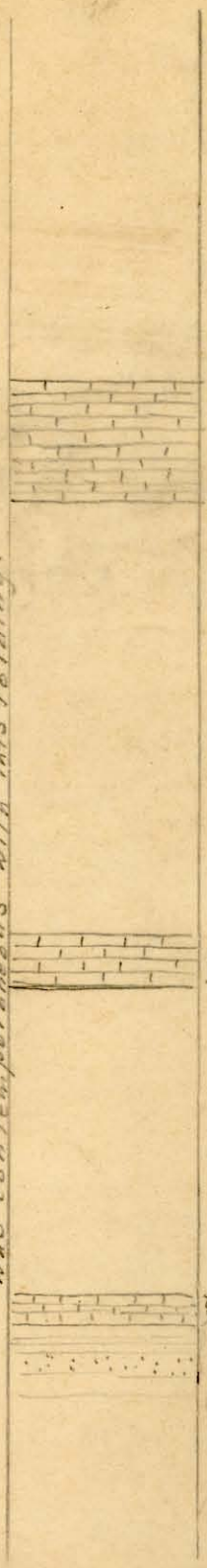
COST OF PROGRAM: (Cont.)

If a large ore reserve is developed there will be, of course, further capital expenditures required, such as raising the shaft through to surface, erection of permanent mining plant and whatever alterations and additions may be decided upon in the mill. No estimate on these can be made now with any degree of accuracy, as they will depend on results obtained in the mine.

In the meantime, the present leasing system is no doubt the best way to work the old parts of the mine. The leasers are working ground which could not be economically worked by the company, and the company is earning a profit without risking any large expenditure. There are also a number of places, some of them discussed above, where there is a good chance to open bodies of ore large enough to be of importance to the company, at no very great expense. It would be good policy for the company to do some of this work while awaiting completion of a larger financing and development program.

Respectfully submitted,

John L. Dyman
Mining Engineer



2500' of siliceous schists, sandstone and quartzite.
Schist predominates - dark gray to purple in color
Weathers on outcrop to a rusty brown.

Beds of white quartzite up to 50' thick occur in schist.

White Caps Limestone - 30' of pure blue-gray crystalline limestone

200' of schist with several Thin beds of quartzite

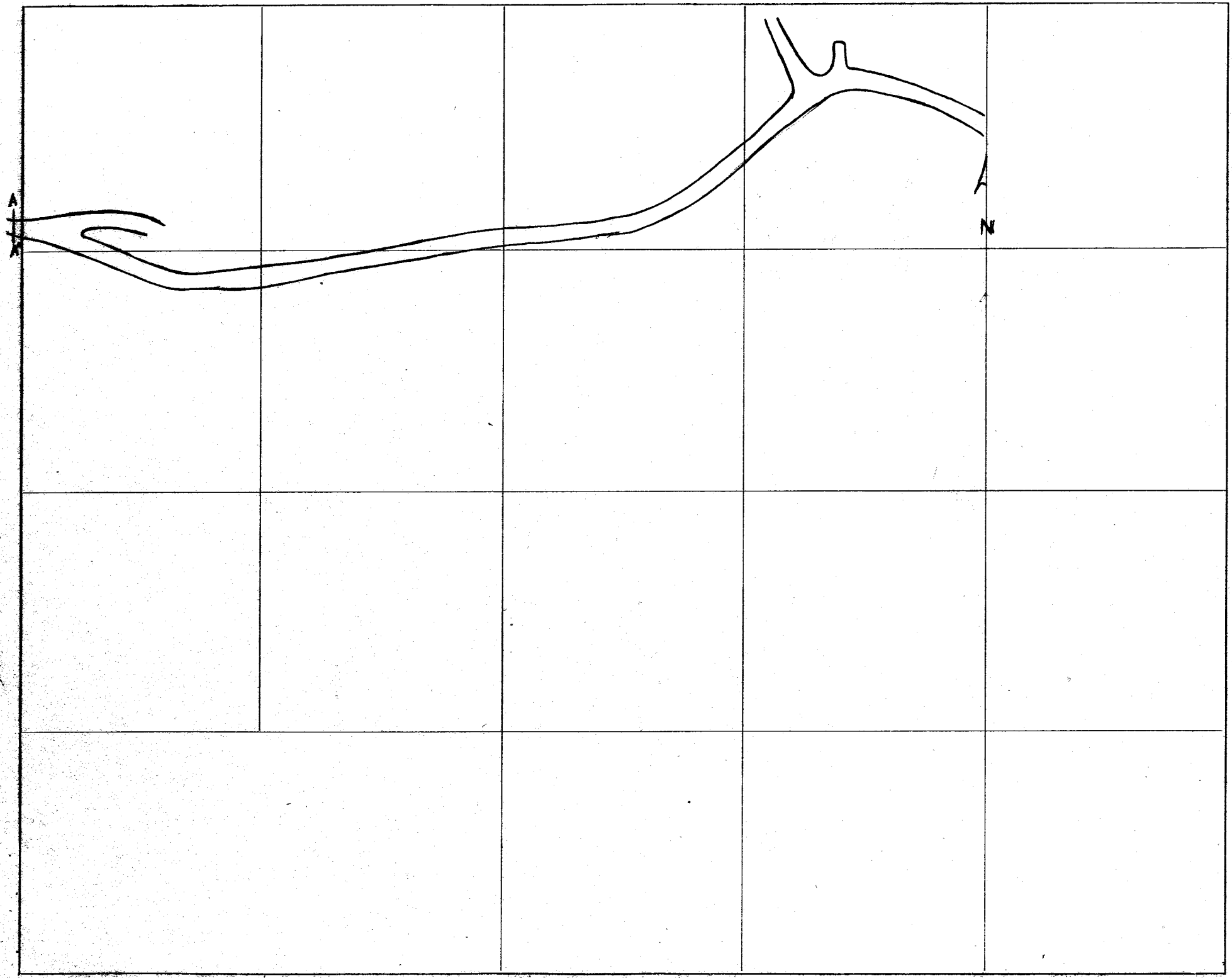
Morning Glory Limestone - 15' THICK

140' of siliceous schist

Pine Nut Limestone - 10' thick - white crystalline with knots of silicate minerals

Series of schistose slate, quartzite & Sandstone.
Base not exposed

Total thickness of sediments is 3500' - 4000'
Under which was intruded a sheet of rhyolite
which brought in the intensive Gold mineralization.
Older rocks were intensely folded in Mesozoic Era
An overthrust fault brought the Cambrian rocks above the Ordovician
was contemporaneous with this folding.



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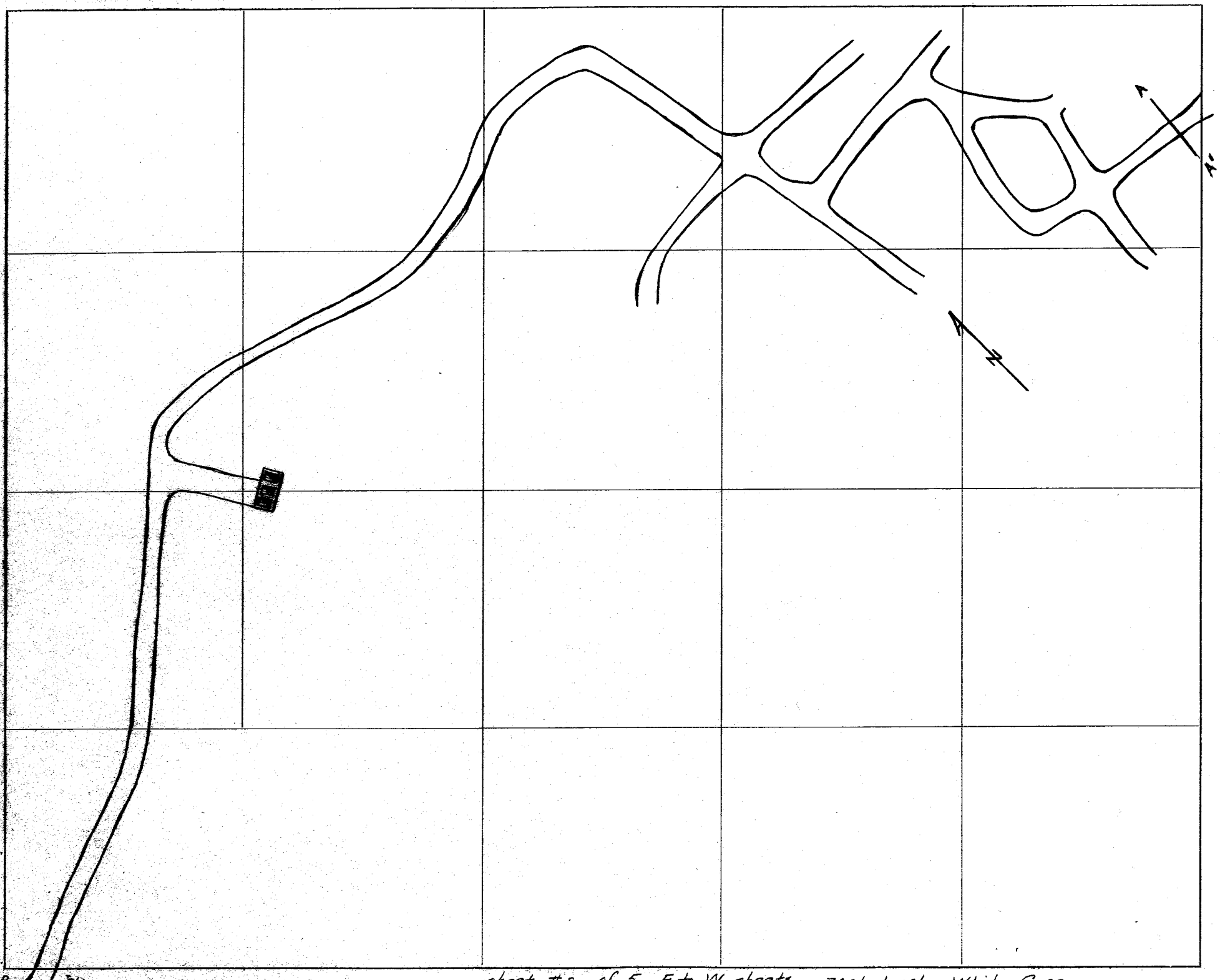

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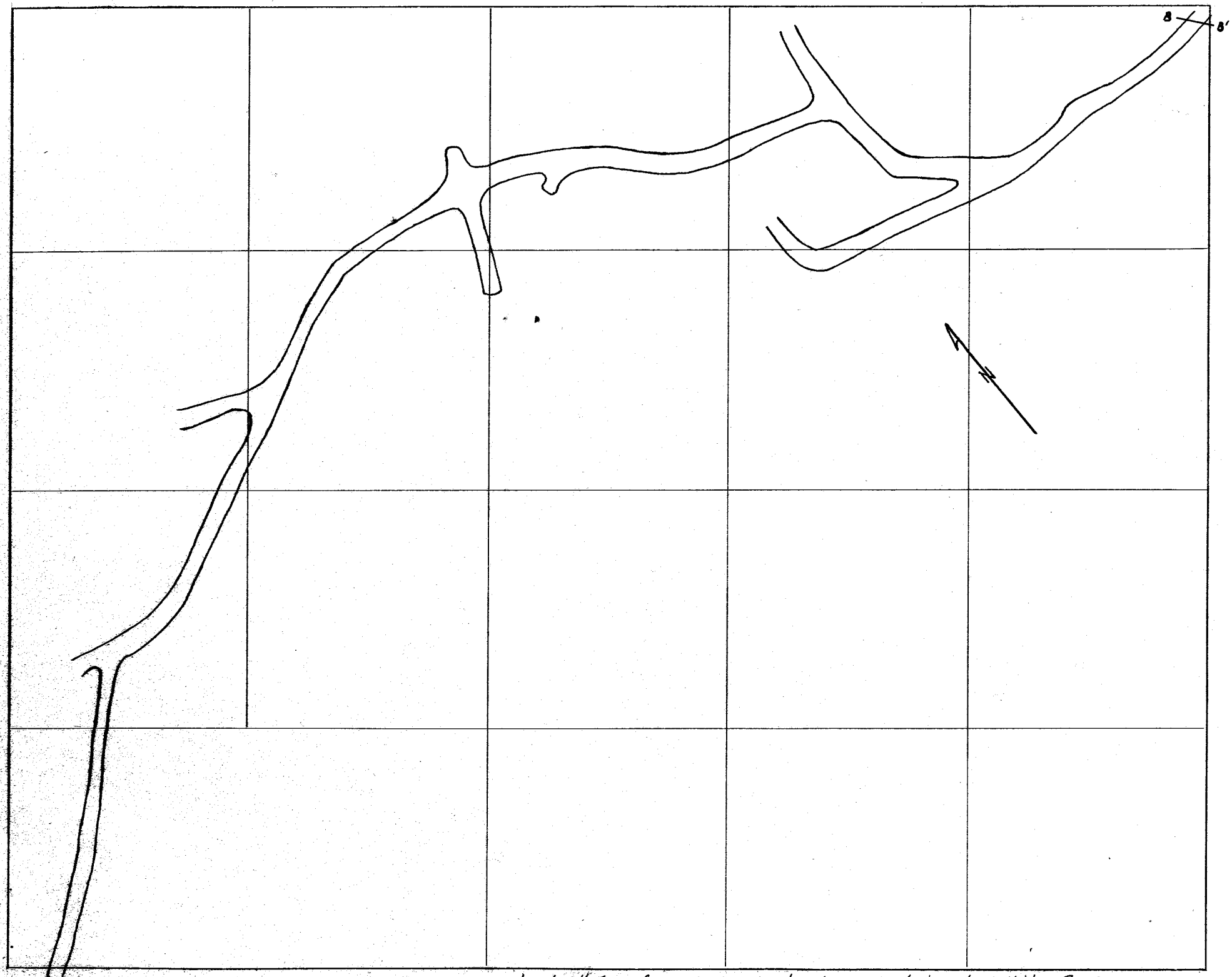

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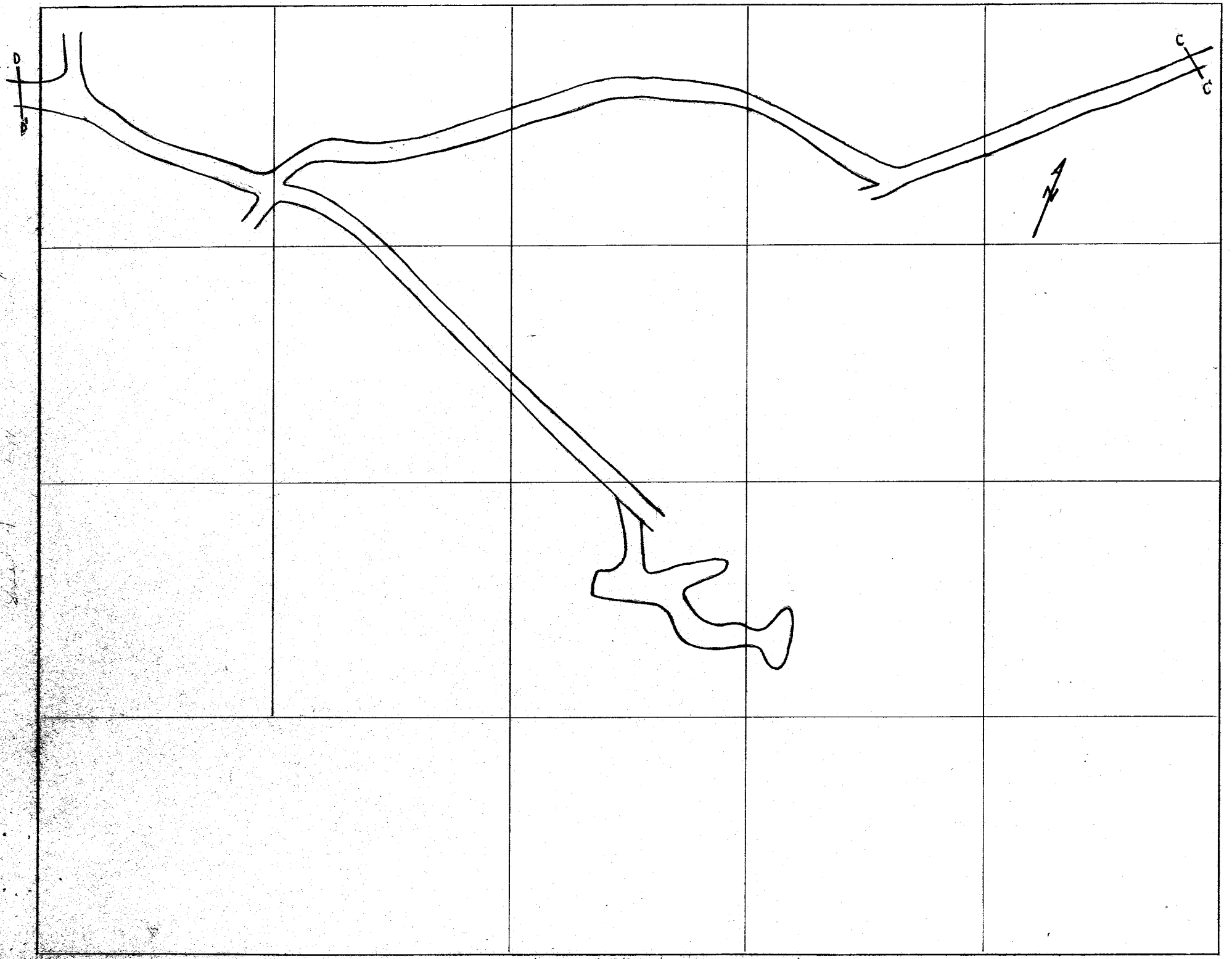

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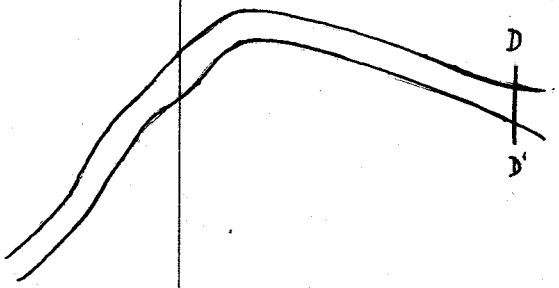

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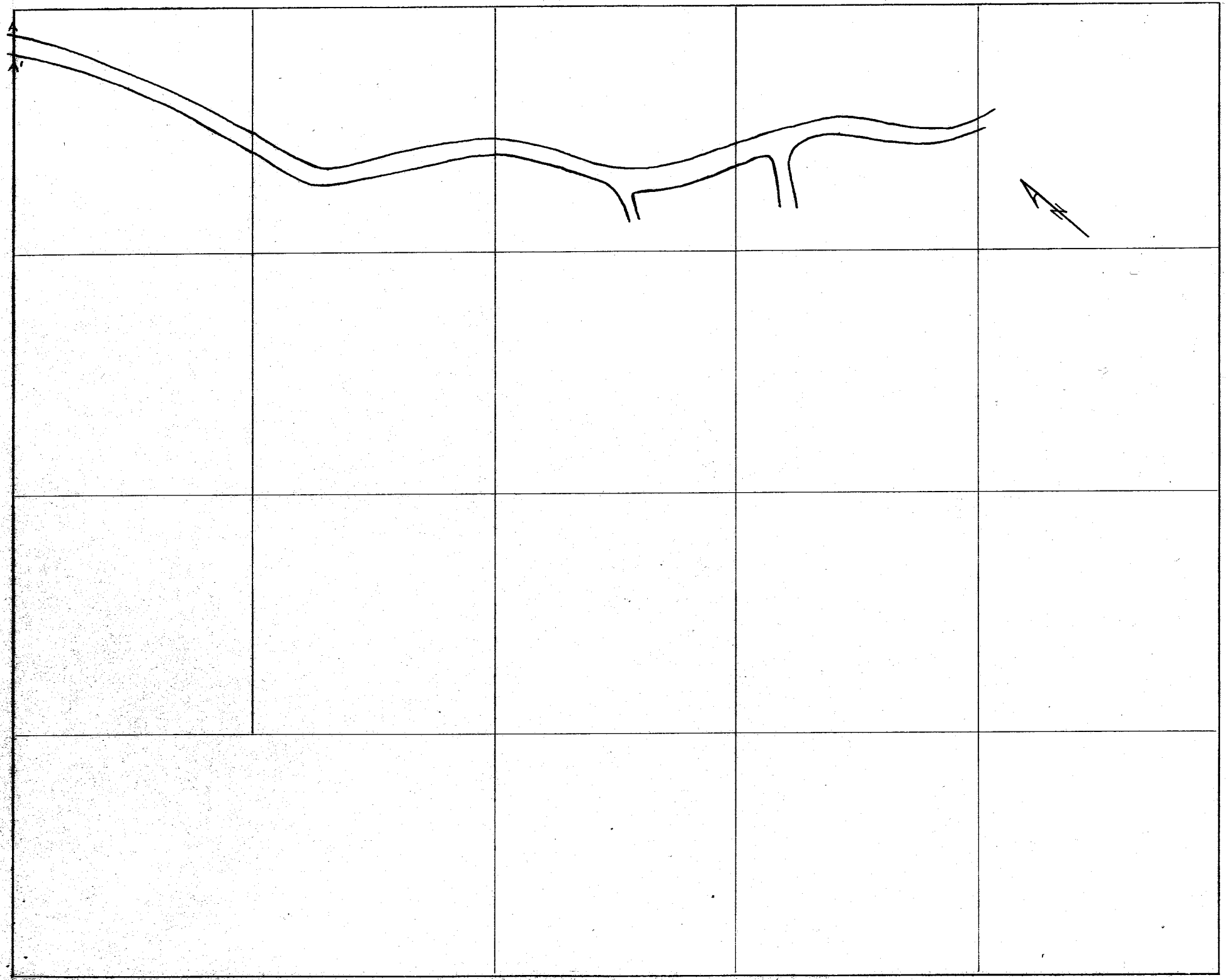

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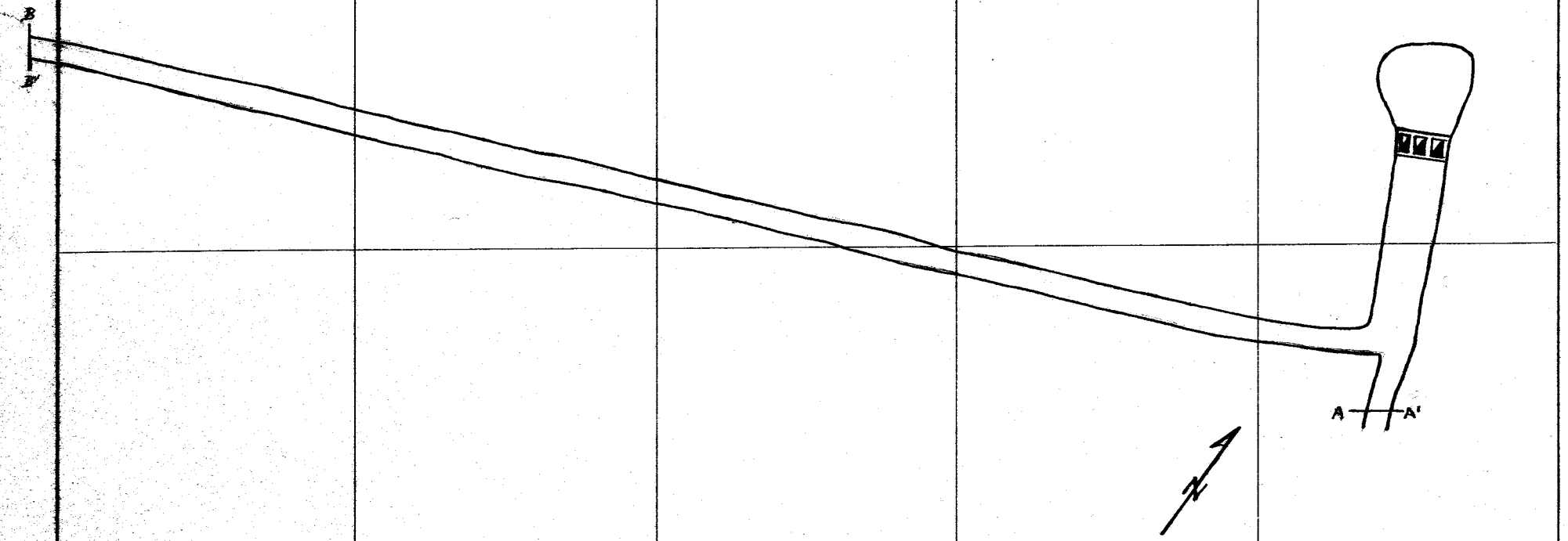

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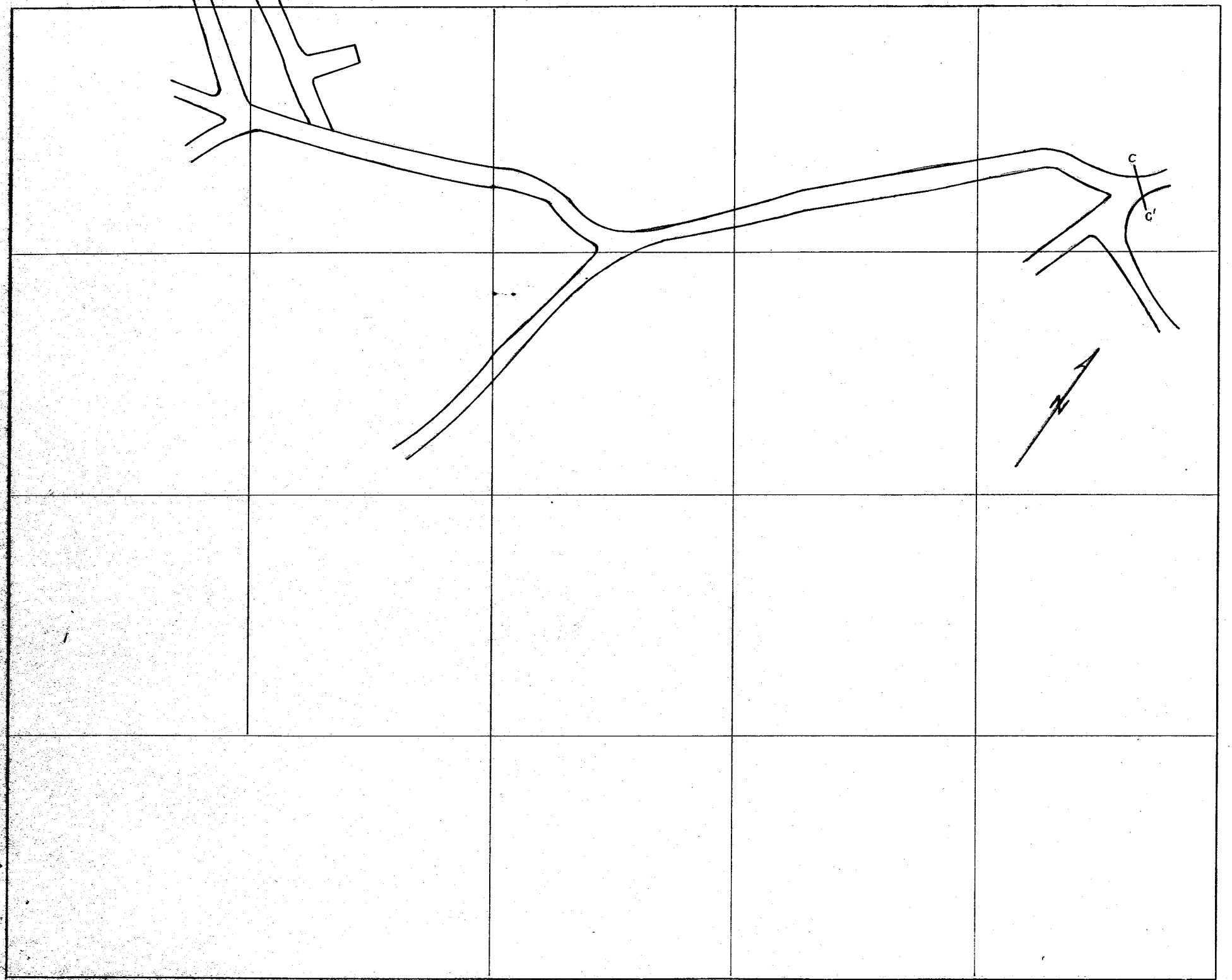

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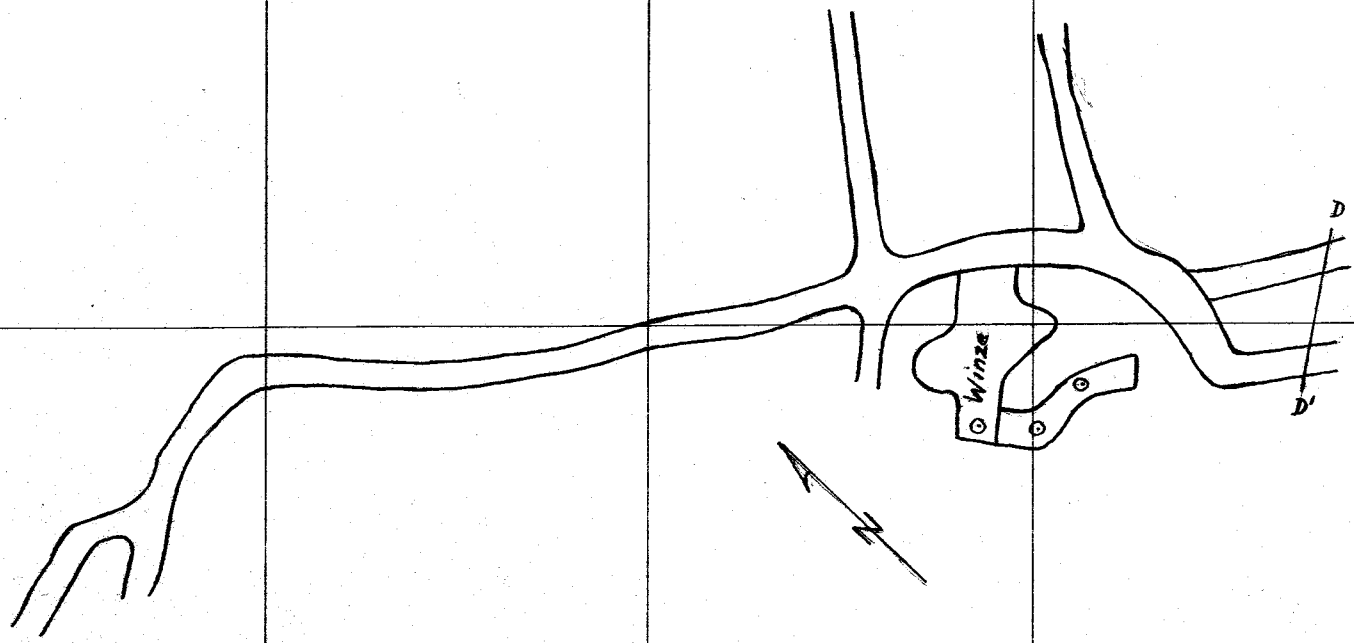

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