MAP A Feb 27/8, 1979
(Orig. extend more to South)
(CII-G-1)
SS: on Brer sampled here by D. N. Also take samples
Miss 2 pillars
Lunch
Lunch Bucket
wide jointing
Wet
27
26
24
22
20
16

B. Silty sh. on coal and erosional contact to Energy sh. Above Energy some Anna present (& 2 anna concs. left on top of Energy just to E. of area of silty shale on coal). Silty shale depresses coal about 1'; micaceous Ss. present on flank of depressed area-but most of exposure is silty shale w. plant fragments. No clear trend of erosion except generally NE-SW. See Nelson notes for sketch.

C. Portion of Ss.-dominated channel has depressed into coal several feet; most of exposure has Anna below. On W. rib of "D" entry the Ss. at the bottom of the gentle "V" is in coal (& having erosional appearance), but the flanks again have traces of Anna; deformation is likely. Closer examination shows med.-grained Ss. is predominant; has "veined marble" appearance with veins of carbonaceous material which is not coalified. On W. rib Ss. is depressed 2' below normal top of coal pos., but no provable erosion because surfaces are all slip-defined on W/ rib. Area to N. has 2 subchannels still cutting Anna.

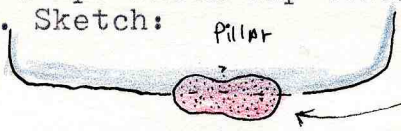
C.North ("D" entry) 3 separate channels i/d here, but Ss. is continuous in roof; for most part Ss. was cutting Anna The base of Ss. has load-cast appearance; there is evidence of Ss. bedding deformation into Anna giving steep inclinations toward center of depressed areas. Ss. protrudes into coal like "bosses" of Ls have elsewhere; Anna traces common on contact.

D. Large Ss. loadcast (~~AGI def. of "flow cast" seems more appropriate~~ no, not contemp.) into area of 1½-2' remnant Anna shale; depression goes to 1½-2' below normal top of coal. A sand dike is injected ca. 1' down into Anna on W. side.

2/27/79

p. 3 of 5, plus 2 maps

Sand dike is along area of many small low-angle extension slips which dip towards center of flow cast. Sketch:

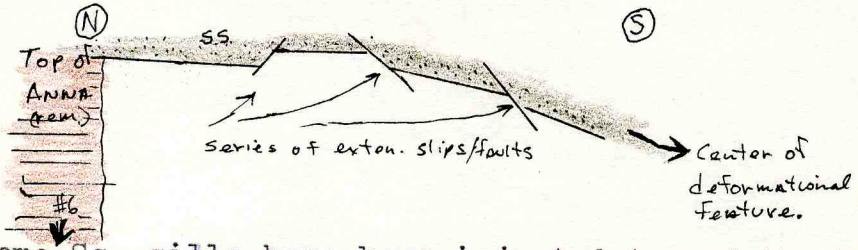


feature is slightly bilobate; diam.(at 40° angle from horz.) is about 8' by 22' long.

E. Channel exp. fully across cross-cut; in center it has "flow cast" appearrence; "Flow cast" is about 10' X 18' (using 40° dip from horz.). As noted above, E. rib exposure shows 2' Anna remaining, but deformation at center is even w. top of coal position. Sand on base checked; med. grained.

E'. Exposure of normal Energysh. showing many pectins on one bedding plane; 25-30 noted, only one joined at hinge; of the rest 4 of 5 were "flipped" concave side down. ~~indicating some water (flow) sorting~~. Less than random chance - re-examine!

E. continued; 3¼' Anna (rea) S. flank of channel & 3' on N. side. N. side shows a set of slips assoc. with the deformation. Sketch;

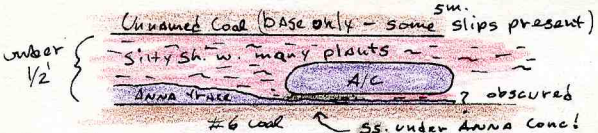


Some Ss. sills have been injected toward the N. on hte E. overhang exposure, away from the center of deformation. On E. rib low-angle slips meet in top coal, forming "X" about 0.6' down.

Several falls in panel noted with poorly dev. Brereton Ls., one w. nod. ls. over ca. 4' Anna

p. 4 of 5. plus 2 maps & photos

(H. out-of order) Interesting exposure of Anna conc. Sketch:



Locally there are some stigmatia impressions on the base of the upper coal and in the plant-bearing shale. D. took one sample of ss. on Brer. for thin-section work.

Mapping in 8th S. Panel & vic. (See Map A)

We recieved report of "wide fissure" in roof on belt entry; a sump was driven & pumped every day. Open joints in Brer. roof are source of water; no fault was found; panel is stubbed in only 4 cross-cuts(See field map B)

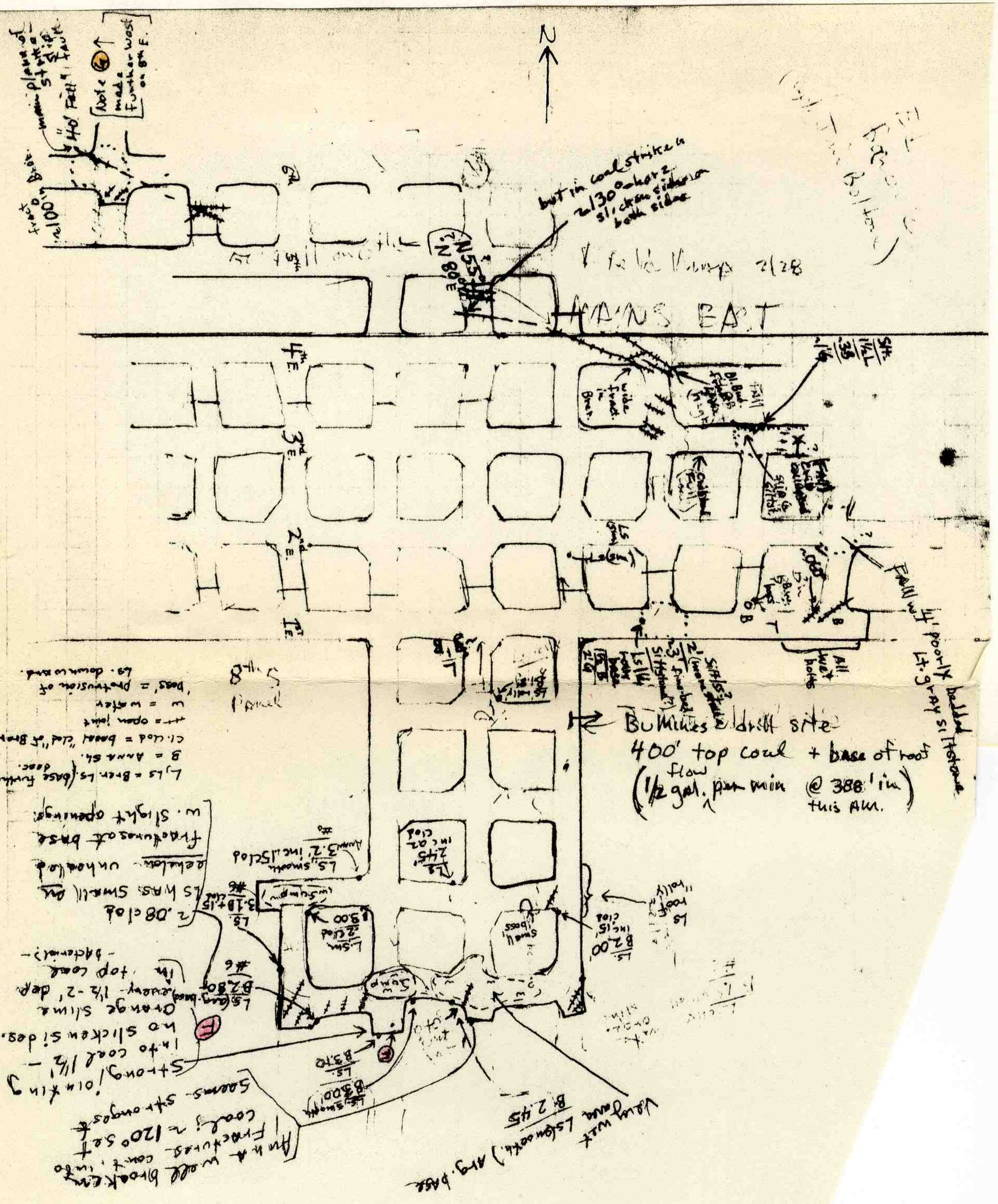
F. Face area is still quite wet (driven in Oct.?) 2 major wet Ls. fractures were measured in roof at about 38° strike.

We then looked at the far E. mains & discovered another strike-slip (apparently) fault system; it is cause of several large falls- one on the 6th and one one the 3rd. E.; this fault does not seem to be very wet.

G. (off sketch map) Possible continuation of strike-slip fault at 5774 cross-cut on 8th E. Just W. past Ls. boss, I noted breccia in healed fracture zone in Brereton. Brere. locally rolly over 1' Anna sh.

Sample

In rooms to west at lg. fall a sample of ss. on Brer. [CII-G-1] was take for further study.


N
MAINS EAST
4th E
3rd E
2nd E
1st E
8th S Panel
N 55° E
N 80° E
BuMines drill site
400' top coal + base of roof
flow
(1½ gal. per min @ 388' in this AM.)
All wet holes
Fall w/ poorly bedded Lt. gray siltstone
Sump

MAp (B) 2/27/8

A COMPRESSION FLORA ASSOCIATED WITH CHANNEL-FILL SEDIMENTS ABOVE THE HERRIN (NO. 6) COAL

*DeMARIS, Philip J.; Illinois State Geological Survey
DiMICHELE, William A.; Department of Botany, University of Illinois
NELSON, W. John; Illinois State Geological Survey
all at Urbana, Illinois 61801, U.S.A.

An unusual roof exposure of channel-fill units was mapped in detail in an underground mine in Macoupin County, Illinois. The normal roof of the Herrin (No. 6) Coal Member (Energy Shale, Anna Shale, and Brereton Limestone Members) has been eroded along an east-west-trending channel that is about 130 meters (430 ft) wide. The mapped portion of the channel is 165 meters (540 ft) long and exhibits a succession of channel-fill units correlated with the Anvil Rock Sandstone Member. These units include small discrete sandstone lenses and thin-bedded sheet sand at the base, overlain by a silty gray shale that contains abundant plant compressions. Above the channel-fill units is an unnamed coal that is locally shaly. The recognition of the origin of these units will aid in mapping these channels and thus reduce future mining problems associated with them.

The compression flora in the silty gray shale is distinct from the flora of the Herrin (No. 6) Coal and of the unnamed coal that overlies the shale. The shale contains abundant *Neuropteris ovata*, *N. scheuchzeri*, and *N. rarinervis*. *Calamites* and *Sphenophyllum* are common. *Pecopteris* and *Mariopteris* are also present, but not common, and lycopods are rare. The distribution of the silty gray shale within the channel and the quality of plant preservation suggest that shale deposition probably occurred along a small stream bank. This stream bank flora, having abundant pteridosperms and few lycopods, contrasted sharply with the floras of both coal swamps, which were dominated by lycopods.

Photos of features mapped on Feb.27/28 trip
(photographed on Mar. 30)

Freeman Crown II - Mine Notes - Macoupin Co.

Trip: March 30, 1979 by Phil DeMaris & Bill DiMichele

Coverage: Introduction
Mapping in W. rooms off 1st N. panel
Photos taken in 1st N. panel
Mapping in E. rooms off 1st N. panel & vic.
Sample; CII-G-2
Photos of general interest
Appendix; DiMichele notes

Introduction

Purpose of trip is to get photos of new (fresher) plant comp. exposures & to fill-out floral list. Secondary purpose was to get a couple photos of the ss. load features & to try to finish recce. mapping in the 1st. N.

Mapping in W. rooms

Maps A & B covered areas mapped; switched several times.

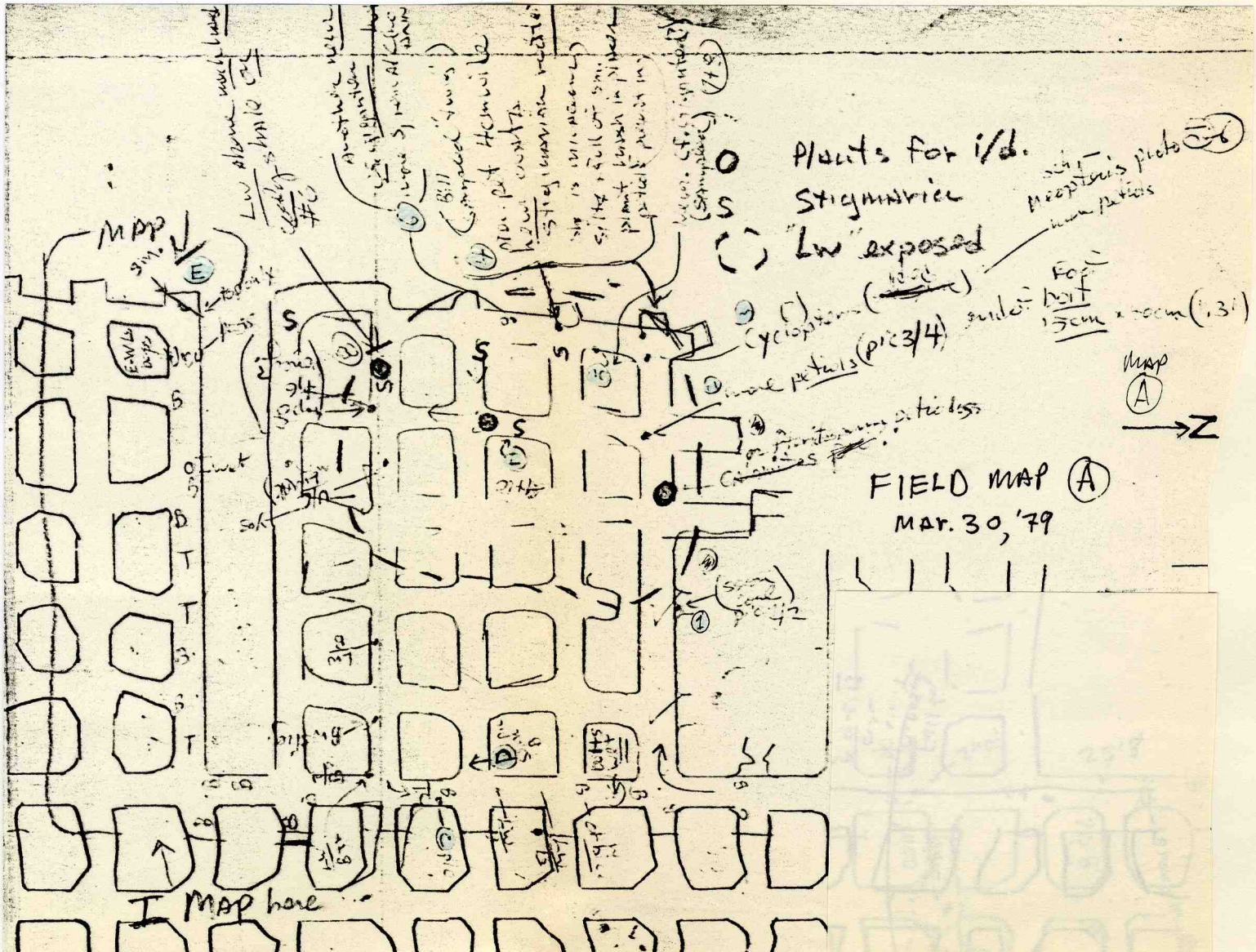
A. Established ref. point on 2418' on "C". Fall on belt entry has come down since mapped a month ago. Fall is 5-6' Anna to base of flat-based unit (Ls.?)- apparently short-bolted. Just to E, Bill looks at coal/Anna contact. Orbiculoidea in basal Anna, lyc. periderm in top coal.

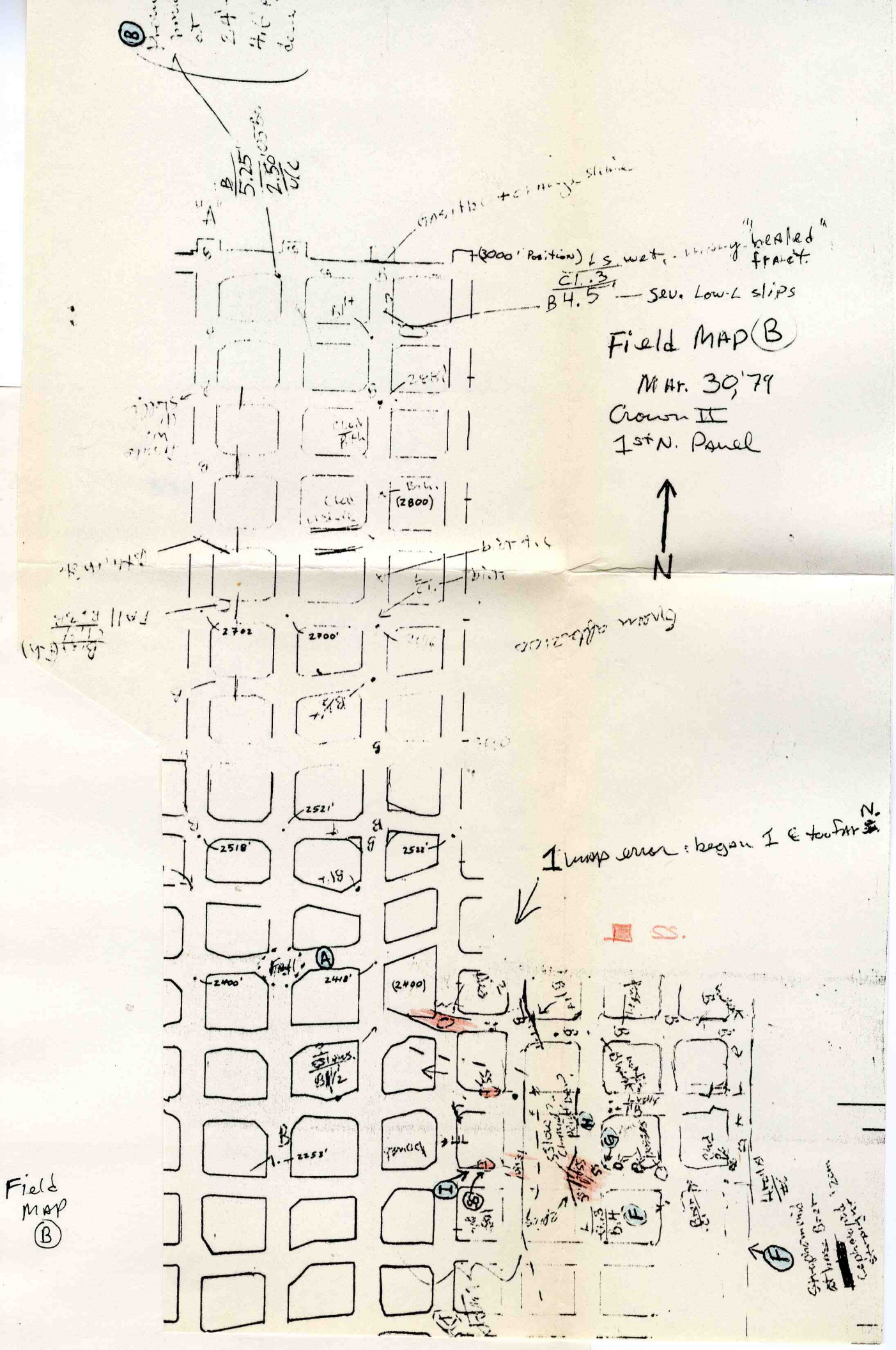
B. On way to W. rooms, took coal thickness at top of panel (Map B):

Anna
5.25'
B.B. .05'
2.50'
uc/c

Other prom. bands at 2.4'(sh. w. coal) & 4.6' (pyr. shale) down.

3/30


Plants for i/d.
Stigmatrix
( ) "Lw" exposed
MAP here
FIELD MAP (A)
MAR. 30, '79


Field MAP (B)
Mar. 30, '79
Crown II
1st N. Panel
N
1 map error: began I ℄ too far N.
2521'
2518'
2522'
2400'
2418'
(2400)
2253'
2702
2700'
(2800)
Field MAP (B)

C. Small roof exposure of sheet-sand on Anna; pics. 11 & 12 taken here and small piece of silty, micaceous Ss.(over 0.4' Anna) was sampled. (CII-G-2) There seems to be no major Ss. chanel on this side.

D. Photos 13 & 14 taken here of Ss. lens (or sheet viewed longi.) with "lw" above. Sequence is: Plant-bearing silty gray sh.
Ss. .08'th, med. grained
Anna Sh. 0.2' th.
#6 coal

E. Small clay dike- gray plastic clay in dike (Roof is Anna); octahedral dipyrimidal pyrite crystals in the clay in the coal; narrow fissure crosses Anna roof, loc. with some slips.

Photos taken in 1st N. Panel

(See Map A and DiMichele notes for details) We began at site 1 taking pictures & noting plants. New finds include a single Cyclopteris leaf and Neur. Cf. gigantea; the abundance of long Pteridosperm petiols (prev. mis-i/d-ed as calamites by myself) was also impressive. Several more stigmaria exposures were noted; they were photographed at site 7. (See map of pht sites, next)

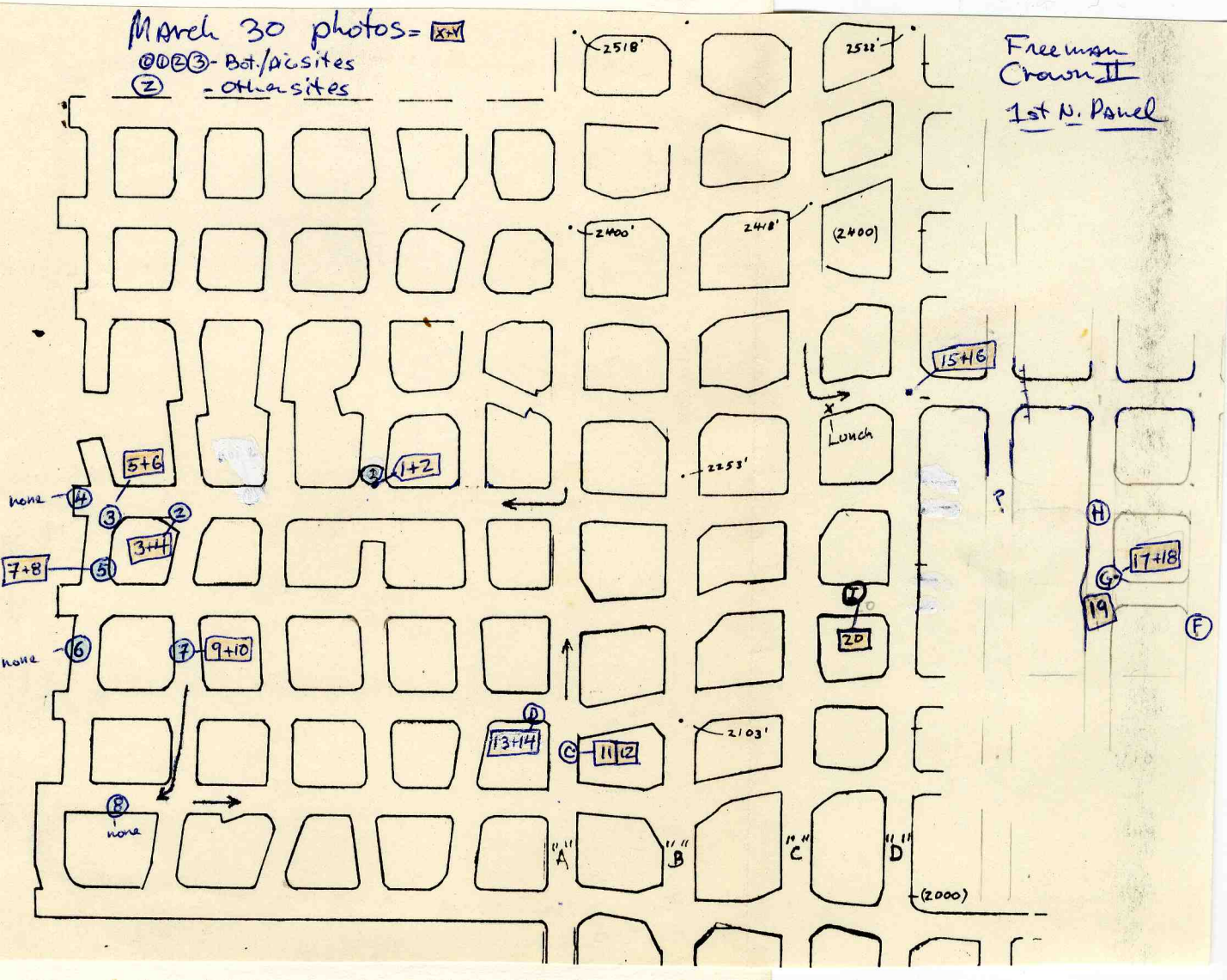
Mapping in E. rooms off 1st N. Panel

Note map errors in Map B in this area; began one cross-cut to far N.; last portion is also one cross-cut too far E.

F. Thin Anna & Brer. roof was encountered where not expected here; Channeled Area has cut south more rapidly than expected Bill notes a strophomenid at base of Brer, and a 12 cm. long straight Cephalopod.

3/30

Map of photo sites



G. Ss. appears to be cutting laterally into Brereton, just above Anna contact; Anna has lt. gray material injected into along many fine, sharp fractures. Photos 17 & 18 show effect to Anna & general position of Ss. This exposure needs de-dusting & further examination. Photo 19 was taken toward the deepest penetration point of the Ss.; here are several feet of continuous sand covering a wide area; here the whole area is depressed en mass so there is no single "protruberance". Ls. bosses very well developed immed. to E; perfect place to examine "boss"-forming mechanisms.

H. Fantastic exposure of Ss. (Med. gr.) injection among bedding, principally on Anna/Brer. contact, 30' from projected axis of main ss. deformation area. Other finer material inj. into Anna and top coal giving a "white top" effect much like that assoc. with clay dikes, only over a broader area.

I. Last (#20) photo of Ss. load feature which depresses #6 coal; no erosion of #6; erosion surf. is on Anna. Several interesting "pockets" of Anna sh. incorporated in Ss. body, evid. occuring during deformation.

Sample: CII-G-2

Ss. on Anna from site C. sampled for thin-section. Phtos 11 & 12 taken here also.

Photos of general interest follow on next pgs.

3/30

Appendix 1 of 3

3/30/79

Crown No. 2, Virden, IL

1st N. Panel

1) Photo 1 & 2 Sand on coal

2) Noted longitudinally striated axes 1-4 cm wide 20-30 cm long. The long striations may = sclerotic bands of pteridosperm pettioles

lots overlain

These axes are fairly widespread for at least 30'-50' from initial area.

— Photo 3 & 4

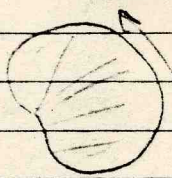
3- branching "pettiole (loop bolt to side 15cm wide)

4- " " + Neighboring long axis w/o branch

3) Another area w/ mod. large

Neuropteris & lots of pettioles

had a nice Cyclopteris



lost in collection

Photo 5 & 6

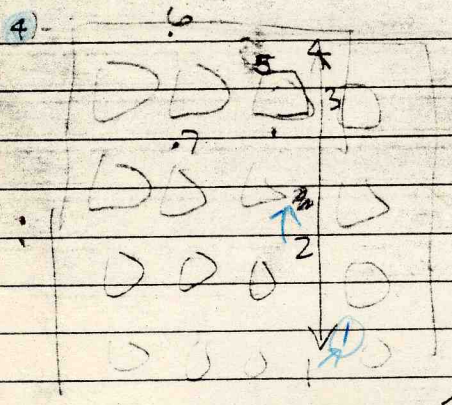
Neuropteris 18mm wide 135mm long

Branching pettiole

scheuchzeri tip

(Pinnule chipped in back & it is quite long)

2 of 3

4) 

Neuropteris ovata
Pyritized w/ "petioles"
cf. Cyclopteris
shale is either here.

collected "twig"
7cm long
4mm wide

w/ Medium Neuropteris on other side

assoc. w/ these "petioles" is a micaceous hash matrix w/ usually degraded & disarticulated plant debris

5) Root exposure w/ abundant "petioles" some up to 15-20cm d & flared at the base

photos 6 7 & 8

Neuropteris cf. gigantea ???
med larger pinnules attached to a rachis.

6) More N. cf. gigantea - well preserved

Stigmaria
N. ovata

lots of disorg. pinnules

3 of 3

7) Neuropteris cf. gigantea
N. scheuchzeri
N. ovata
Stigmaria
photos 9 & 10
9 – two Stigmaria areas w/ rootlets
sites in D. notes 10 – one " " " "

(C) Photo – 11 } contact of Micaceous SS / ANNA
12 } poss calamites? in SS

(D) Photos 13 } contact of SS
14 } w/ ANNA

on "D" entry Photos 15 } Sand "pods"
16 } also shows some injection

(G) Photos 17 } Sand cutting laterally in Brereton LS &
18 } Anna, some injected into Anna
19 – Load cast – sand loaded into underlying beds incl. coal

(I) 20, SS / coal contact – one main area from #19, same X-cut

FREEMAN UNITED COAL MINING CO. CROWN II MINE
April 19-20, 1979
Notes by John Nelson on visit with Phil DeMaris

Investigation of channel and related features in 1st Panel North. Numbers refer to locations on map.

1.) Roof fall exposes erosional contact at base of channel. North of the fall, along the east rib, the immediate roof is black, fissile Anna Shale, grading upward to mottled, dark gray olive or greenish silty shale; poorly bedded, containing numerous marine fossils including brachiopods and coiled cephalopods. The highest exposed stratum (about 1 foot above the top of the coal) is a hard layer, probably the base of the Brereton Limestone. Water is dripping from the roof nearby. The rest of the area has top coal in place, so the transitional zone cannot be observed.

In the fall itself the Anna Shale is 2 to 3 feet thick. The lower portion is "slaty" with occasional large concretions. About 2 feet above the base is a prominent horizon of light brown phosphatic lenses. Above this the shale is darkly mottled, poorly bedded, appears burrowed in places and is finely micaceous, but no fossils or limestone was observed.

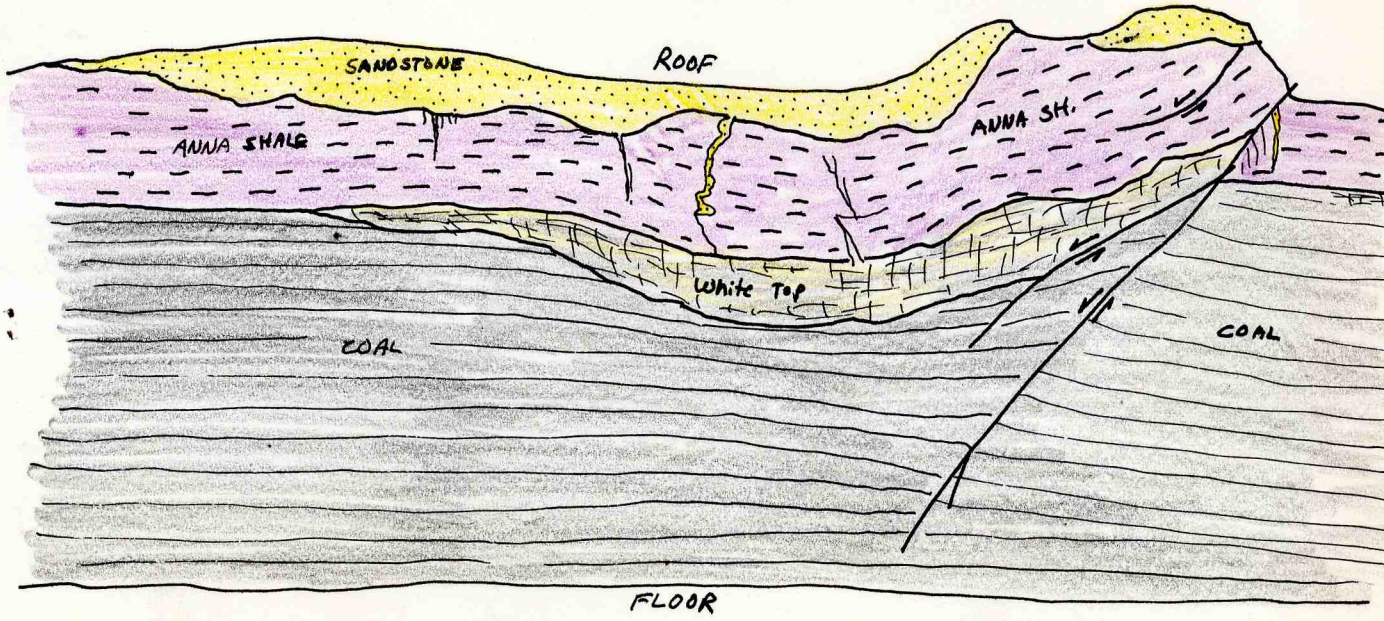
The base of the channel is an irregular surface, cutting down to the northwest and truncating the upper part of the Anna Shale. The channel-fill is the usual light gray siltstone and fine-grained sandstone; micaceous, argillaceous, and thinly laminated, with partings of greenish shale. No sedimentary structures other than irregular bedding are visible. Commonly along the base of the sandstone irregular masses of what appears to be pyritic limestone are present. The masses are dull, dark bronze in color, fine-grained, very dense and hard. Occasional small masses of crystalline calcite (?) are also seen, partly within the shale below the erosional contact. These were sampled.

I would interpret that the Brereton Limestone was formerly present, but was eroded away and some pieces incorporated in the sandstone.

S

VIEW LOOKING WEST

N



2.) Large sandstone-filled roll, probably a slump structure, trending southeast from the south edge of the fall mentioned above. Width is 15-20 feet, and exposed length is about 40 feet. This may connect with a similar feature in next entry to the east.

The coal is not eroded, but it and the overlying black shale are displaced downward along slips. The contact of sandstone to the Anna Shale is sharp, very irregular, and definitely erosional. Occasional sand-filled fractures and veinlets occur in the shale, and also some sand is squeezed between layers of the shale

A notable feature is the thick zone of "white top" below and adjacent to the roll. The top layers of the coal and the lower layers of the Anna Shale are much disrupted and intermixed with gray silty clay, locally pyritic. The zone is over a foot thick below the low point of the roll, and thins laterally. In places the transition from "white top" to overlying undisturbed shale is abrupt; elsewhere it grades. Some veinlets of sand communicate from the "white top" to the main body of sandstone, but otherwise sandstone and white top do not touch each other. See sketch on following page.

The sandstone filling the roll is thinly and irregularly laminated with dark shale and with parting of coaly debris. Occasional larger inclusions of dark shale are seen near the base of the sandstone. I do not see any ripple marks or other structures that could indicate the direction of currents in the original channel. No changes in lithology are notable, either vertically or laterally. The maximum thickness of sandstone observed is about 2 feet. We take a few samples of sandstone for thin-sectioning.

My interpretation is that this structure is the result of slumping due to loading of sand on semi-lithified shale and peat. The "white top" was formed a the time of slumping, by a mixture of peat and clay.

3.) Small roll of sandstone, not laterally continuous

Along the south edge a wedge of sandstone has intruded about a foot into the Anna Shale, following a bedding plane, and bending the upper layer of shale upward as a "rider". The "rider" splays outward into the main body of sandstone.

South of here the coal is overlain by Anna Shale from a few inches to about a foot thick, with sandstone above. Exposures are not very good.

4.) Black shale is thinning to the north and east, and grading upward through calcareous shale into limestone. The transitional "clod" consists of silty, dark gray shale with marine fossils. To the south and west the limestone has been eroded and replaced by sandstone. A few remnants of limestone can be seen along the contact, with their tops planed off.

In places the "clod" resembles the Lawson Shale, but the two can be distinguished by the presence of shells in the former and abundant plant fossils in the latter.

5.) Phil's Station C- took samples of sandstone in direct contact with limestone.

6.) In this area a very thin (0-0.2') layer of Lawson Shale occurs above the Herrin Coal, and is in turn overlain by another layer of coal in the main roof. This is the "bony" coal of the Anvil Rock sequence, as observed in the Main North. Here it is finely blocky, generally dull and bony, with thin bands of vitrain. Stigmaria are quite abundant and are colored orange. In places the bony coal probably lies directly on the Herrin Coal; where no shale is present the two coals are very hard to distinguish. The shale is dark gray, sandy, micaceous, carbonaceous, and pyritic.

In map view the channel is making a bend toward the southeast, and here we are near the inner side of the bend. At the outside of the bend, sandstone was deposited; here, in quiet water, only mud and organic material.

7.) Above Herrin Coal is black shale (Anna) with large and beautifully preserved orange-colored Stigmaria on bedding planes. In places the Stigmaria occur at several horizons stacked above one another. The shale contains large flattened concretions. Some Stigmaria are on the base of one. When broken open, the concretions are seen to contain abundant dark red colored plant matter, mostly broken fragments, not identifiable. No Stigmaria can be seen to penetrate a concretion. Near the east rib the black shale is only a few inches thick and is overlain by coal; mostly bright banded with blocky cleat filled by white calcit but with layers of dull or bony coal intercalated. Phi sampled the coal.

The Stigmaria are evidence that a real swamp was growing above the Anna Shale, and that the coal is not wholly detrital. The dull layers of coal, however, could still be detrital organic material washed about by water.

8.) Roof fall exposes unusual and interesting sequence of strata. This is what can be seen from the west side of the fall:

Top: Shale or claystone, dark gray, mottled, greasy appearance.
0.7' Limestone, gray, nodular-bedded, concretionary.
2-3' Siltstone, medium gray; upper part is massive in appearance, downward faint parallel laminations are seen. The basal 0.1-0.2' consists of sandstone; light gray, fine-grained, micaceous, containing angular fragments of black shale and limestone.

The entire unit thickens westward and the overlyin limestone is lost to view above the top of the fall. A prominent band of dark gray shale about 1/3 of the way from the top of the unit can be seen.

The basal contact is sharp, highly irregular and definitely erosional, with a channel-lag deposit.

0-0.5' Limestone (Brereton), dark gray to dull brassy (compare Stop 1); fine-grained with fossil fragments, nodular, preserved only as a few remnants; discontinuous to east.
1.5-2.0' Shale (Anna), black, smooth, fissile; prominent zone of light brown phosphatic lenses at top of unit. Shale thickens to southwest, but the phosphatic zone everywhere remains near the top of the unit; nowhere is it visibly eroded.
Herrin (No. 6) Coal-not studied. See DeMaris Note "L".

To the east the section changes (See Phil's Note L). The parting of dark shale curves downward through the siltstone and merges with the top of the Anna Shale as the siltstone below pinches out. The siltstone above the dark shale parting maintains its thickness of a little over a foot. The limestone above that thus comes closer to the Anna Shale. The limestone most likely is the lower bench of the Bankston Fork.

9.) Small fall at face of room. Section as follows:

Flat top
1' Siltstone, light greenish-gray, sandy, micaceous, argillaceous, thinly bedded. Ripple marks on top of fall are current ripples which indicate the currents probably flowed toward the east-northeast (Not definite; it could have been the opposite direction.) Steep sides of ripples appear to be to ENE. Basal contact of unit is sharp and slightly irregular.
1' Shale (Anna), black, smooth, fissile, phosphatic zone near top. Sharp contact at base; thins slightly over gray shale.
0-0.8' Shale (Energy); gray, thinly laminated, forms a pod thickest to southeast. Not present at north and west side of fall.
Herrin (No. 6) Coal- not studied.

A few nodules of what appears to be limestone

occur at the base of the siltstone.

From the appearance of the siltstone, particularly the ripple marks, I would suppose it to be an overbank deposit near the channel. Ripples look like the kind that would form under shallow, gently moving water or maybe by wind blowing across an expanse of water. The indicated direction of flow is nearly at right angles to the local edge of the channel.

10.). Large roof fall, not cleaned. Sequence of strata:

3' Siltstone, parallel bedding, no ripples. Sharp contact:
1' ? Shale, black, phosphatic. Grades into:
4' Shale, dark gray, well bedded, thinly laminated, hard, carbonaceous, contains pyritized Pecten, smooth to finely silty. The dark gray shale is widespread here; presumably it is the dark phase of the Energy Shale.

To the east is another fall to the base of the siltstone; same sequence of shales is seen.

The lower contact of the siltstone looks erosional but is not unconformable. This is more or less a normal sequence.

Interpretations

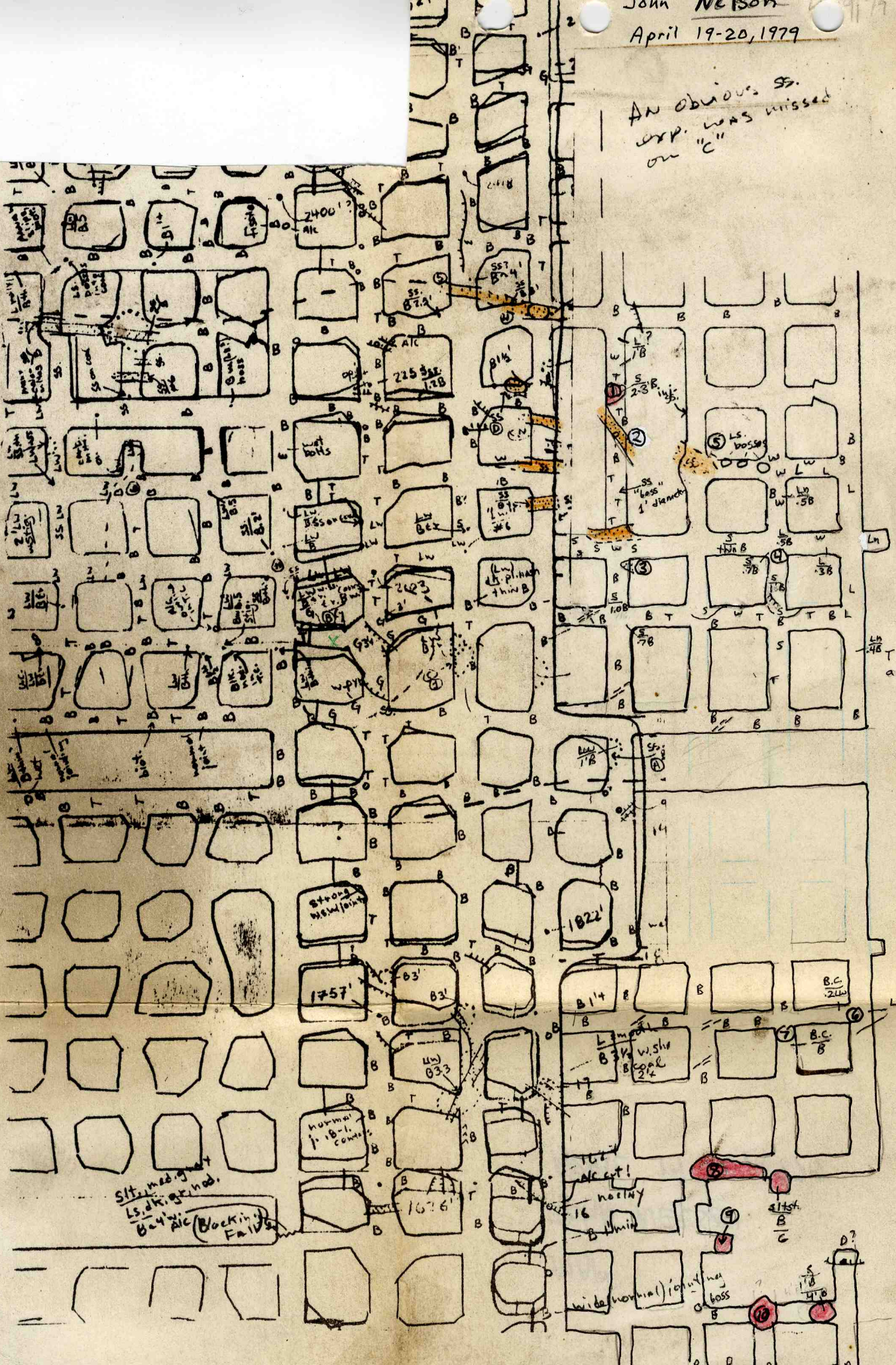
During the time the Lawson Shale and Anvil Rock Sandstone were accumulating, a large river probably occupied more or less the same channel as the Walshville river had previously followed, south and east of Crown II. This "Anvil Rock river" carried a largg amount of sand in addition to silt and clay. Its channel was eroded below the level of the Herrin Coal.

This large river had a number of tributaries, distributaries and "bayous". One of these flowed through what is now the north part of Crown II and eroded the marine units below, leaving the channel-fill we have been studying. We do not have firm evidence yet of which way this small stream flowed, but most

likely it flowed sluggishly toward the main "Anvil Rock River". In times of flood large amounts of sediment were washed into this small stream and winnowed by its currents. The coarsest material was left as lag in the bottom of the channel and near the outside of bends where the water flowed most rapidly. Silt was washed over the banks and deposited as a sheet, such as seen at Stops 9 and 10. At a greater distance from the large and small channels, only mud was deposited, and lay much of the time as open mudflats. This mud became mottled greenish shale, such as forms the Lawson Shale at Monterey No. 1 and old Crown I Mines.

John Nelson
April 19-20, 1979

An obvious str. irr. was missed on "C"



Mine Notes - Freeman Crown II, Macoupin Co.

Trip: April 19-20, 1979 by Phil DeMaris and John Nelson

Coverage: Mapping in 1st N. Panel (Anvil Rock Channel area) to L. IX-ICC trip D run-through; notes & corrections
Further Mapping in 1st N. panel (M to Q)
Sample Set H (-1 to -15) and SP-01 to SP-06
Addenda: Theory of origin of Ls. "Bosses"

Mapping in 1st N. Panel (not done P3D)

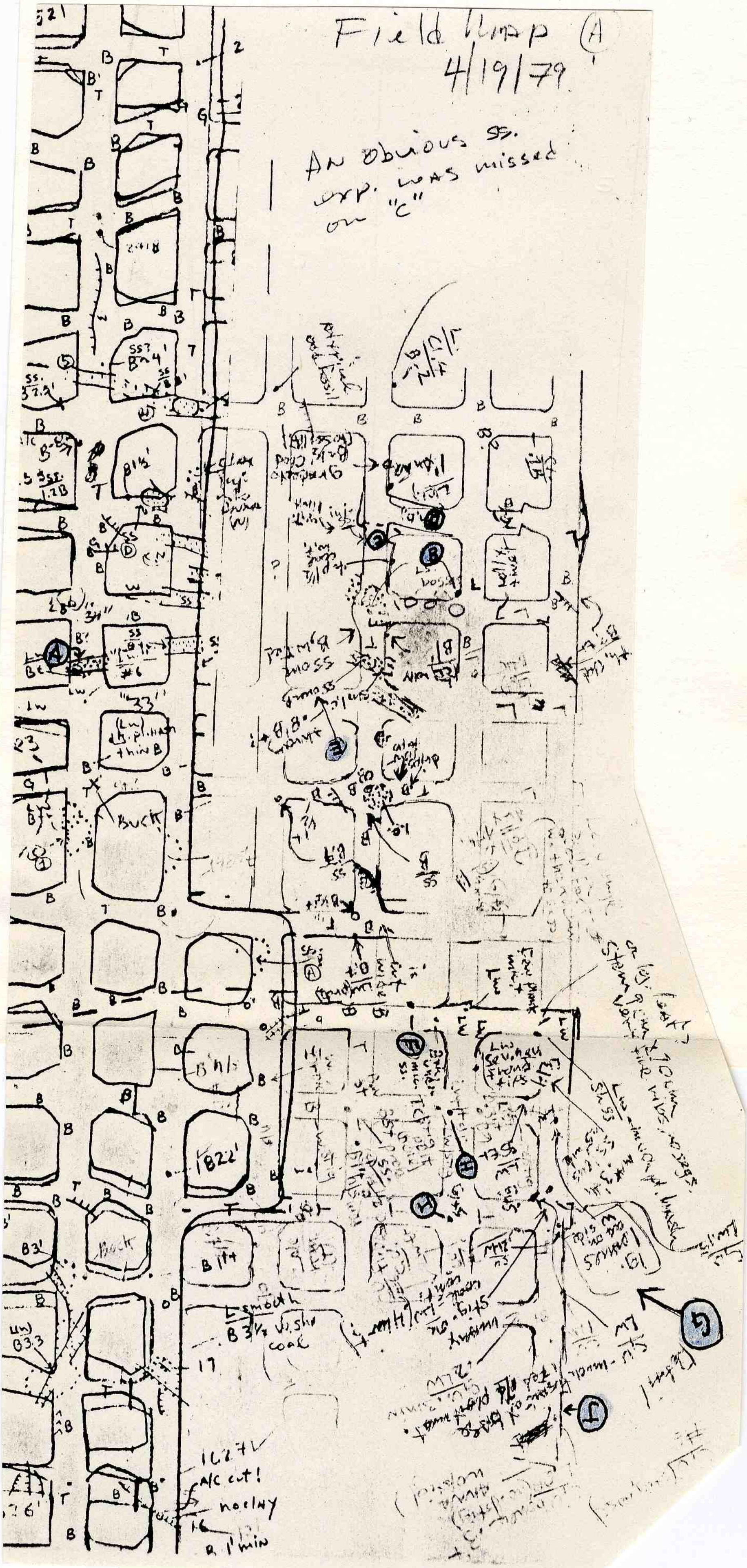
Mapping continues this trip on the East side of the panel; special efforts were made to sample the sandstones both for part. size anal. and for evidence of flow direction.

A. (See Field Map A) Ss. from base of a descrete channel sand deposit. (SP-01 sampled)

B. Ss. under Brereton here; has been inj. laterally from the West ; 0.6' th. Some silt/sand in Brer. above Anna contact may have been injected (from above) also, or have been

C. The top half-foot of the #6 has been "white-topped"; silty ss. lens again between top of Anna & "rolly" base of Brereton. Anna about 1½' th. is "white-topped" with silty sand material. "White-topped" material in coal is predominently gray plastic clay, while lenses in Anna are coarse, with mica flakes. Question of syn-sed. or "one-shot" origin is still open, but force would seem to be considerable.

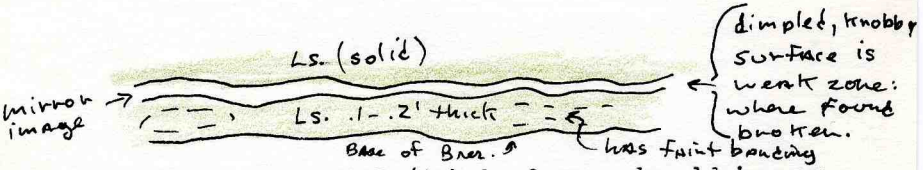
MAP A 4/19/79



Field Map A
4/19/79
An obvious ss. exp. was missed on "C"
Buck
B22'
B 1' min

D. Base of Ls. is dimpled, knobby; Anna is 0.8' thick; Brere. has broken along a weak zone 0.1-0.2' up. I suspect this effect

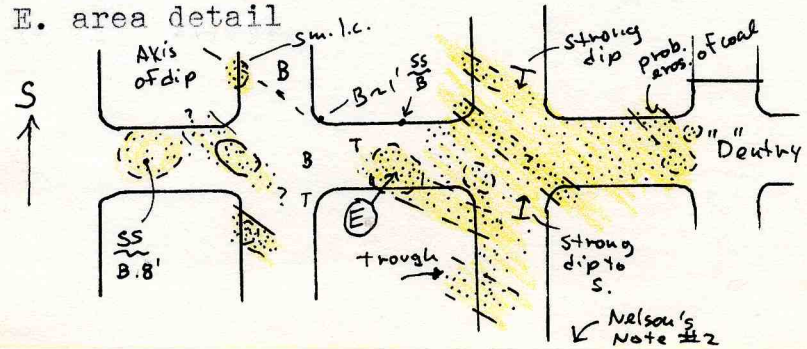
some knobs as sm. as golf balls



may be shock induced (high freq. knobbiness has been seen near edge of channel-effected area); N. rib. here shows mixing and flowage of lighter (colored) material- prob. "clod"- into the top of the Anna shale. Pieces of Brere. base sampled (-H-2) show nodules or deformation structure within them. They will be examined microscopically.

E. At first thought to be an exposure of Ss. cutting coal/peat; bedding is bowed down 2' (with sev. low- & med.-angle slips below) beneath a large load structure. Traces of Anna are found on contact indicating Ss. was still cutting at Anna sh./mudstone? before deformation began. At edge of exposure, and Anna conc. was pressed further up into Ss. than expected (prob. eros. remnant); the conc. has been fractured slightly with Ss. veins up to ¼" present within it. It broke brittlely not in a "mushy" manner, judging by this behavior.

E. area detail



F. Ls.(eros. rem.?) over thin Anna; Ls. or Δ conc.? is pushed down into Anna; 2' away there are stigmaria root and rootlet impressions on Anna sh.; coarse ss. lag is above Anna. Ls.(calc. shale?) sampled ; -H-3.

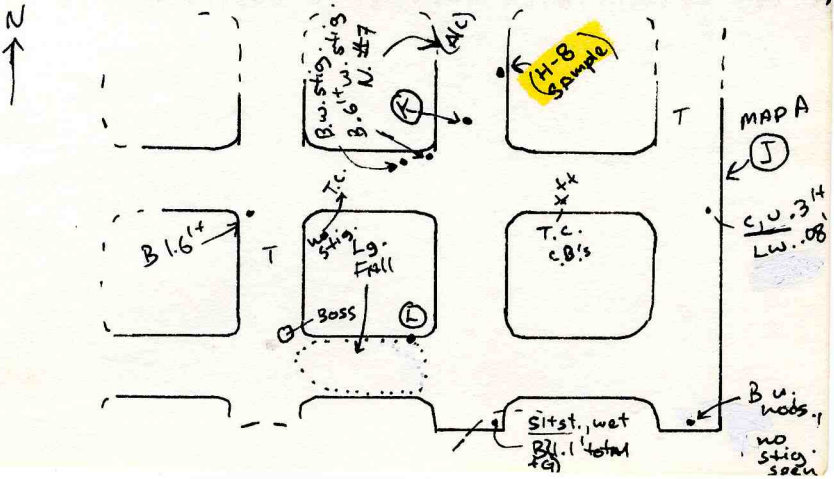
G. "LW." shale thicker in corner; is lt. gray at base; prominent stig. root 0.5' wide. Plant preservation is better in lower shale than in siltier, more carb. "lw." above it has fewer plants. Unnamed coal (base only) overlies Lw. here also (see detail, left)

H. "Lw."/#6 contact sampled (-H-4); believed to show wavy erosional contact.

I. Unnamed coal 0.4'+ shaley .3' plus
"Lw." 0.15' Br. bnded. 0.1'
#6 coal. w. many stig. impressions on bedding planes.

The stig. weathers orange; impressions were found to 1.0' deep only, giving a max. below the coal here of 1.2' deep.

J. (is a detail map which suppliments map A)



K. Odd conc. in Anna which has small shells; possibly an odd a/c?

L. Desc. in roof fall (See Nelson's desc. from here also) From top: (see *) (8)

Nodular Ls. 1' thick where best dev. & exp. sod (Bankston Fork?); lies conformably on:

SS./sltst. 0.4-0.6' thick; fine gr. ss. grades upward to siltstone (Sample H-7)

Carb. shale with coal traces 0.1-0.2' thick; lies conf. on: "coal, upper" when present c,u

Siltstone, gray; 0.7' thick; slightly micaceous, locally sandy at base (Sample H-6); erosional & prob. deformational contact to:

Anna Sh., (bk) 1.4' thick, fissile at base, but not blocky.

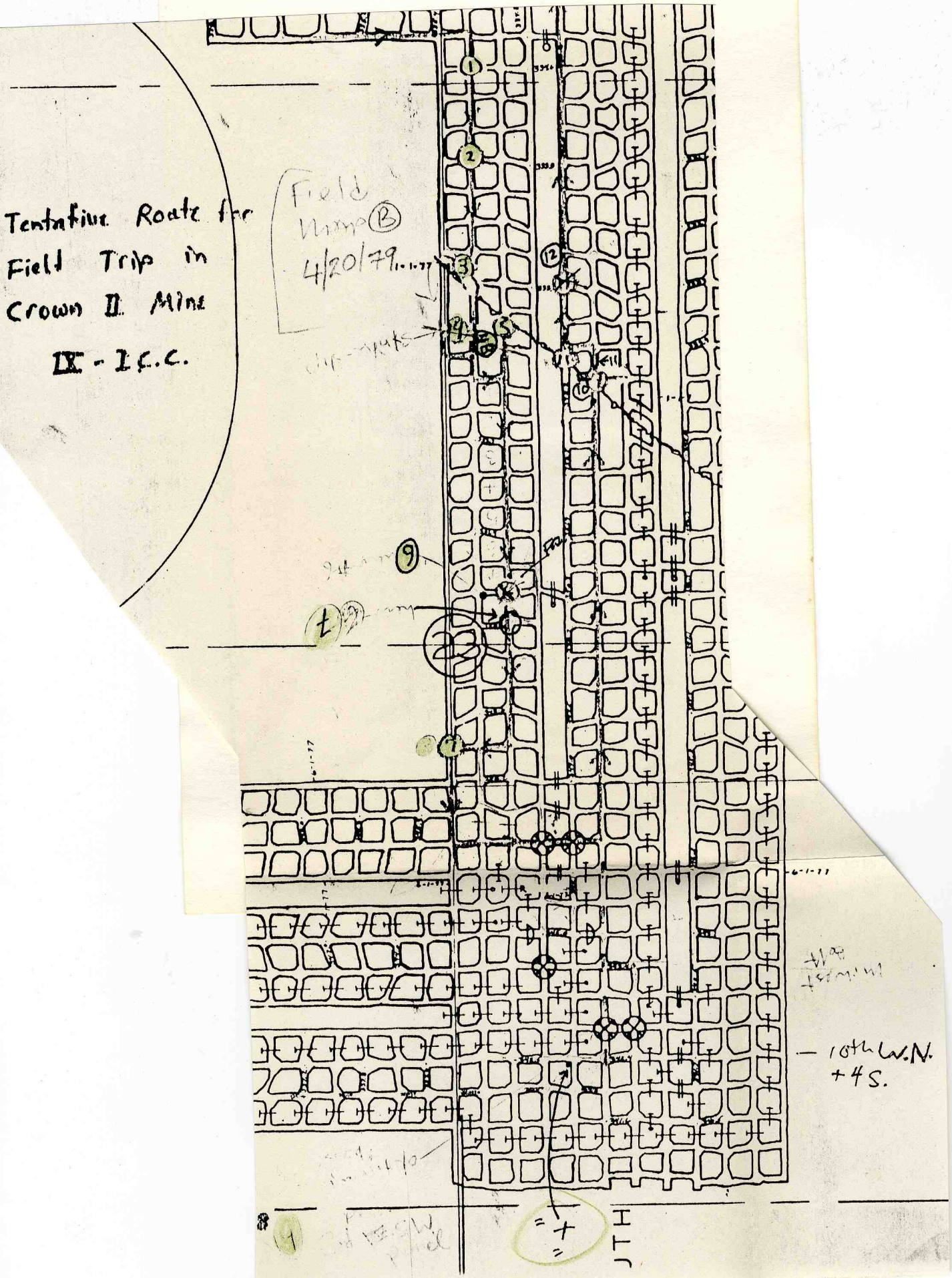
Herrin (No. 6) coal.

*(Note) Unit above top, nodular Ls. unit is dark & is slickensided immed. above Ls. exposure; Ls. seems to be bowed down-unclear whether reason or result of fall.

End day 1

John & I made first run-through of IX-ICC fieldtrip D, correcting route & gathering some data (my coal thicknesses); Stop numbers were changed once again after they were changed during this trip; indicated (thusly).

MAP (B) 4/20/79


Tentative Route for Field Trip in Crown II Mine
IX - I.C.C.
Field Map (B) 4/20/79
10th Lv. N. +45.

Stop 1 Coal th. taken just to N. of "1" on map (See field map B) [Stnd. accy. of .05' on coal, .01 on B.B.]

Anna
5.60'
2.40', 0.11
u/c

Took a prob. durain band for examination. (-H-15)

Stop 2 Coal th. taken into crosscut;

Energy (dk. gray shale)
5.65'
2.35', 0.06
u/c

Stop 3 (4) Went around pillar to lesser of two split faults; B.B. exhibits some ductility in comp. w. brittle fracture of the coal.

Stop 4 (B?) (North of 5 of 2nd N. entry) 20' north of fault on E rib could not find the B.B: seemed to have been a durain band(?!); to N. finally did find a prob. B.B.

Stop 5S (6) At N.W. cor of pillar took th. and desc. of prom. coal banding (excl. fusain);

?
5.50'
0.06' & typical app.

From top of seam:

22.5cm	Very thin pyritic shale or pyrite parting.
37 cm	3mm durain over 5mm vit. over 2-5mm pyrite band.
50 cm	3-4mm Shale ptng. w. pyrite
80 cm	2-3 cm Shale band-locally thinner; some coal in lower 2/3

102 Durain split by vit.; 2 cm. tot.

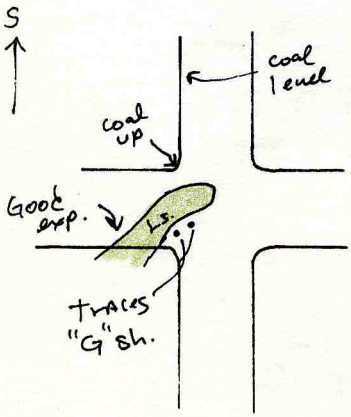
108 2 cm. Shale parting, w. some coal stringers & much fine coal/ carb. material.

148 Prob. 2 cm. durain w. some pyrite

167 (Blue band) ; no prom. bands below

(6) See below

Stop 7 (8) A sub-linear "boss" (Ls.) is well-exposed here, w. traces of "G" shale on the N. side. Guidebook fails to mention "G" Shale here; is ment. in assoc. with bosses at stop 3; ref. is made to "extensional forces" as prob. cause of bosses; I believe causal links between ls."bosses" at the edge of "G" shale roof area and true "clay dikes" are limited. The fact that there is "W.T." and clay in the exten. ~~ski~~ slips below "bosses" does not make them "clay dikes" in the same sense as those desc. by Krausse & Damberger (1979); abstract.



Stop 6 (7) Th. at S.E. pillar corner(SE cor. of intersection)
Anna; transition is gradational over
Energy ("G") 1.45' 0.4'
5.95' -some interlam. at contact
- B.B. is 0.07' thi.

Prom. bands; (cm. from top):36 cm. (pyrite), 64 cm (shale) & 95 cm.(shale)

(on the way to Stop 9 -now 10)

I took a coal thickness at "X" which is at intersection of 10th W.S. and 4th S. at the SW corner of intersection (not pillar);

Energy
5.80' B.B. is 0.06 & normal ap.

Just to N.E. here is an overcast cutting through a Ls. "boss" - good sample spot!

Stop 11 (13) Normal fault and strike-slip fault cross each other. Strike-slip fault (younger) displaces normal f. less than a cross-cut's width.

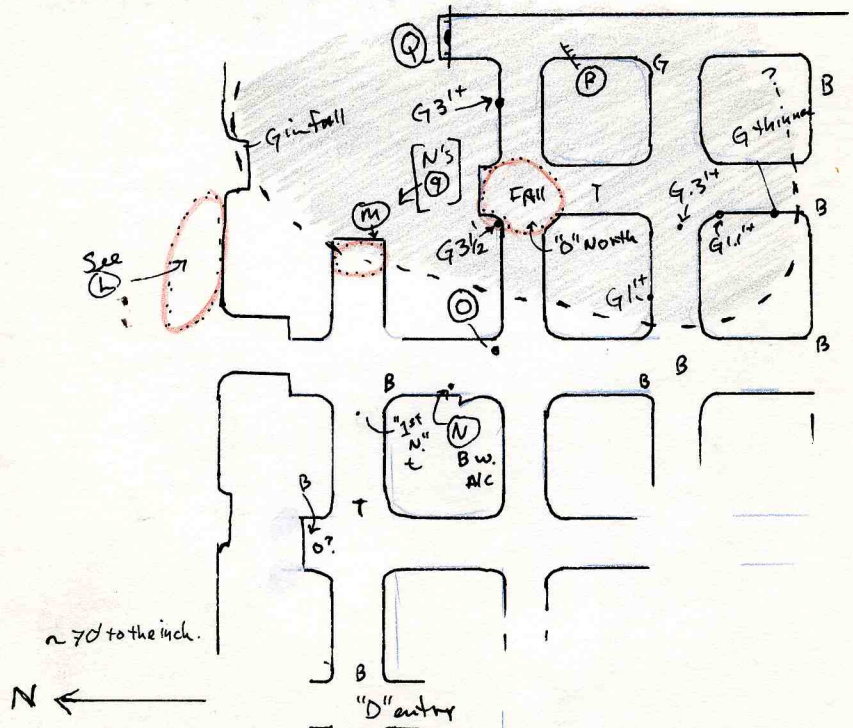
Stop 12 (14) Impressive Ls. "boss" area w. "white-topped" coal below it. In CC to E. there is a large fall through the Brer. (Nodular ?, about 0.8' th. in poor view), several ft. of siltstone, and to the base of the Bk. Fork ls. (Last field trip stop)

Further mapping in 1st N. Panel (Notes M to Q)

M. John thinks siltstone ripple marks present here (over) in fall can give current direction; (see notes)no sketch of ripples or measurements were made; I note that steeper flanks of ripples are to NE (070°); infering direction on one obs. may be dangerous. See Nelson's site 9.

N. Anna sh. is highly shot through with lt. gray. slightly micaceous, siltstone. Anna is 1.4' plus (a/c's present) w. siltst. mat'l more present toward top; top of coal is slightly "W.T." ed with slightly lighter mat'l. No clay dike-like feature.

Map of last mapping area



O. Ls. boss coming down into Anna about 1 foot. Site 'O North' is a roof fall showing an erosional contact on Brereton Ls. overlain by siltstone (See Nelson site 9). Consideration should be given in this area considering the dating of the Ls. bosses; the ls. "bosses" which typically flank areas of "G" (Energy sh.) roof in this mine may be absent in the A.R.Channel areas; the boundary areas should be examined closely because the bosses could also be removed by erosion. Concerning the origin of "bosses" flanking Energy roof areas, see my hypothesis on their origin in the Appendix.

At "O North", north rib corner: ca. 3½' Energy sh., just less than 2' Anna, "white-topped" at the top, then siltstone above Anna. → Actually EAST!

P. Energy shale is very dk. gray, finely laminated with pyrite tetrahedra in basal 0.4'. Coal interlamination is common at base, with some coal stringers to 0.4' above contact. Pectin frag. noted (are spotty in distrib.) A couple dish-shaped conc. have formed in this unit.

Q. Face stopped in "G" roof- shale injected on E. rib, and with "short range" clay dike in "G" roof and slightly into coal; much crystaline pyrite in clay dike which extends a max. of 2⅛' below contact & strikes E-W.

Samples; Set "H" complete (-1 to -14)

H-1 (Reassigned to SP-02)

H-2A,B,C 3 pieces of the base of the Brereton w. knobby surfaces & banding (folding?) structures from D.

H-3 Poss. ls. remnant (test against a/c/ls) from F.

H-4 Contact of "Lw."/#6 coal from H.

H-5 Odd conc. in Anna at K.; appears to have small shells and sphalerite.

H-6 Siltstone from L. (0.7' th. unit); carb. shale is at base.(oriented)

H-7 Ss. from L. (0.4'-0.6' thick unit); oriented.

H-8 Basal 0.3' of "unnamed coal"; enough for chem., etc. anal., where dep. over remainders of Anna sh. ~~coal~~ LTA. (#L-2221) and trace elements (not run) to be run.

(From heap site K.)

LTA = 29.89%; 2.92% Moisture; Ash in storage. PJD. 8/80

In 1/81 C-21351 H, T, Ash (Moist, Free) = 22.6%; T, Sulfur (D×Ash) = 11.2%

(day 2 samples)

H-9A & B Hand samples of SP-03 and SP-04 (Nelson's 2A and 2B); channel ss.

H-10 Ls. from "boss"; prob. Brer. from site "0".

H-11 Ss. channel on Anna; oriented hand sample.

H-12 Oriented Ss. sample from on Anna at Nelson site #2, E. rib.

H-13 Oriented Ss. sample from 1' above Anna, 12' south of H-12 site, E. rib.

H-14 Ss. dike/sill in Anna from Nelson's #2. (site #1)

3 other samples kept sep. by N.; SS. in contact with Ls; 3 pieces, but only one w. pebbles of Ls.// Portion of Anna conc. with plant frags ./ (site #7)// Ss. in cont. w. Brer. N's #5;3 pieces; nice but unoriented.

Special samples and Ss. bedding samples

SP-01 Silty Ss. from site A,, day 1
SP-02 Clay "white top" mat'l from top of #6; Nelson site #2, day 1
SP-03 Ss. channel at base (N's 2A), day 2
SP-04 Ss. " , 1' above base (2B), day 2
SP-05 Basal Ss. with pebble lag (N's 1), day 2
SP-06 Ss. dike in Anna (N's #2), day 2 (is a split of H-14)

H-15 Dull coal band (drain?) from IX-ICC Trip site 1 (as numbered here) (added 7/81) PSD.

FREEMAN UNITED COAL MINING CO. CROWN II MINE
April 26-27, 1979
Notes by John Nelson on visit with H.-F. Krausse.

On the morning of the 26th we walked through the route of the upcoming field trip for the International Carboniferous Congress. The route is in the Main South Entries, and will include a visit to a working face at the 1st or 2nd Panel South off the Main West.

Stop 6 of the trip is scheduled to be at the exposure of the strike-slip fault in the 3rd Main S. Here we note something new (see sketches). In the crosscut where the fault intersects the south rib, striations on the fault plane indicate right-lateral movement. The fault strikes ESE, the north side is upthrown, and the slickensides plunge 37 degrees to the west. On the rib the vertical throw is only a few inches, but a few feet to the west the coal is upthrown more than three feet. This is an abnormally high vertical throw for this fault. In particular, the change in throw is abnormally abrupt.

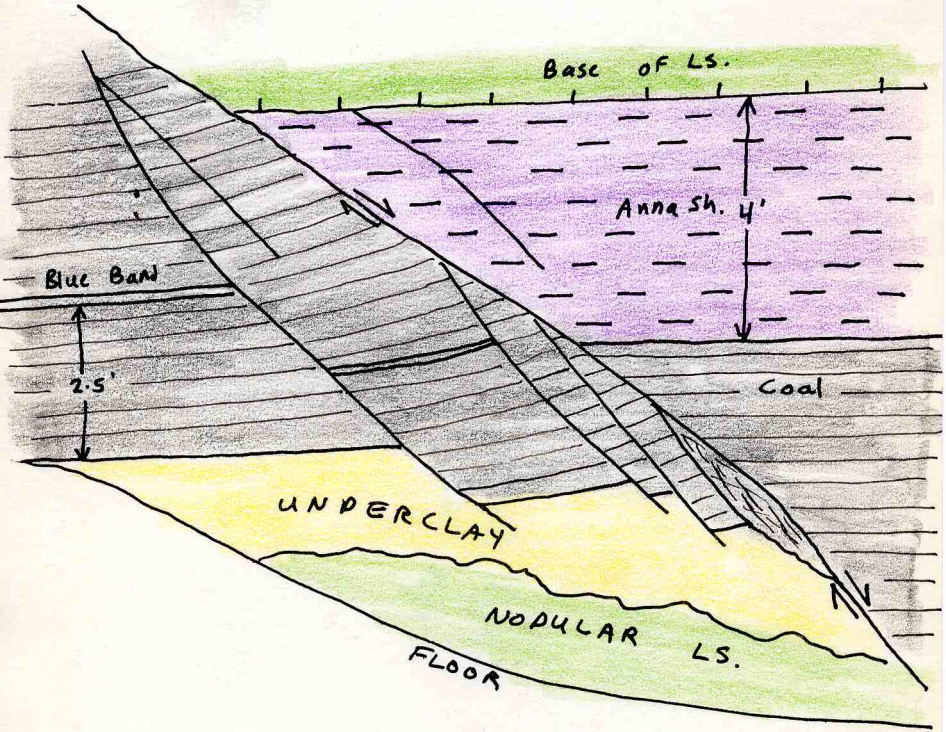
I would speculate that the original movement was left-lateral, but later a small amount of right-lateral movement occured, due to elastic rebound. On any fault the slickensides show the direction of the last movement, which is not necessarily the major movement.

On the afternoon of the 26th, and all day on the 27th, we mapped the return entries (9th through 12th Main South) at a scale of 1" to 50', and completed our detailed map of the faulted area in the Main South.

19.) Normal fault on 10th Main South. The fault plane branches, as shown in the sketch. Several smaller faults striking parallel with the main fault occur south of the main fault. Very intense fracturing also occurs perpendicular to the fault.

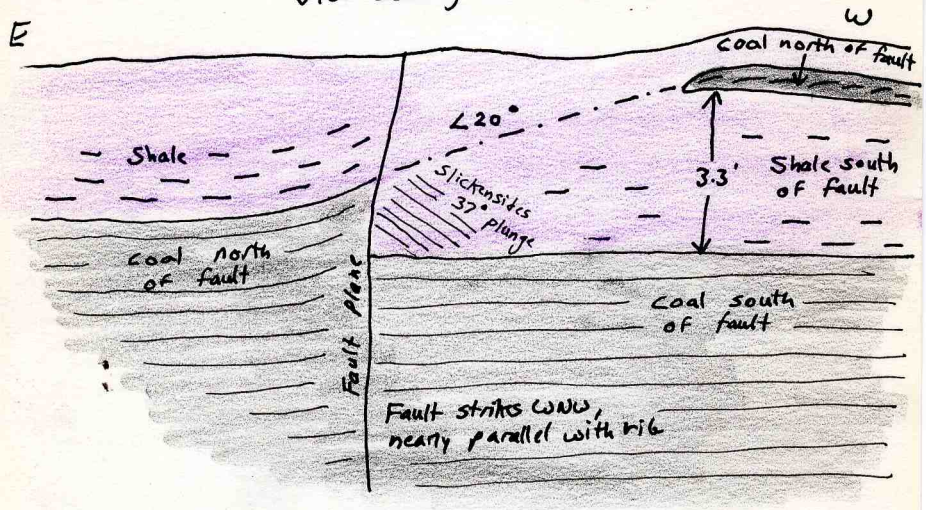
On the west rib, as shown in the drawing, the coal has slid downward in a series of slices which are tilted slightly to the south. Slickensides indicate purely dip-slip movements.

STOP 19
SKETCH OF WEST RIB



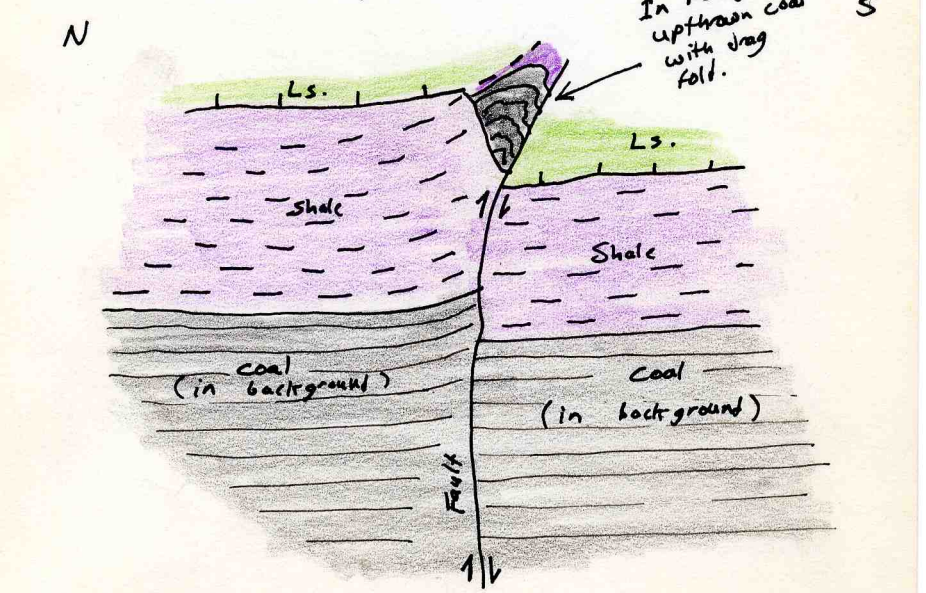
FORM 180 W

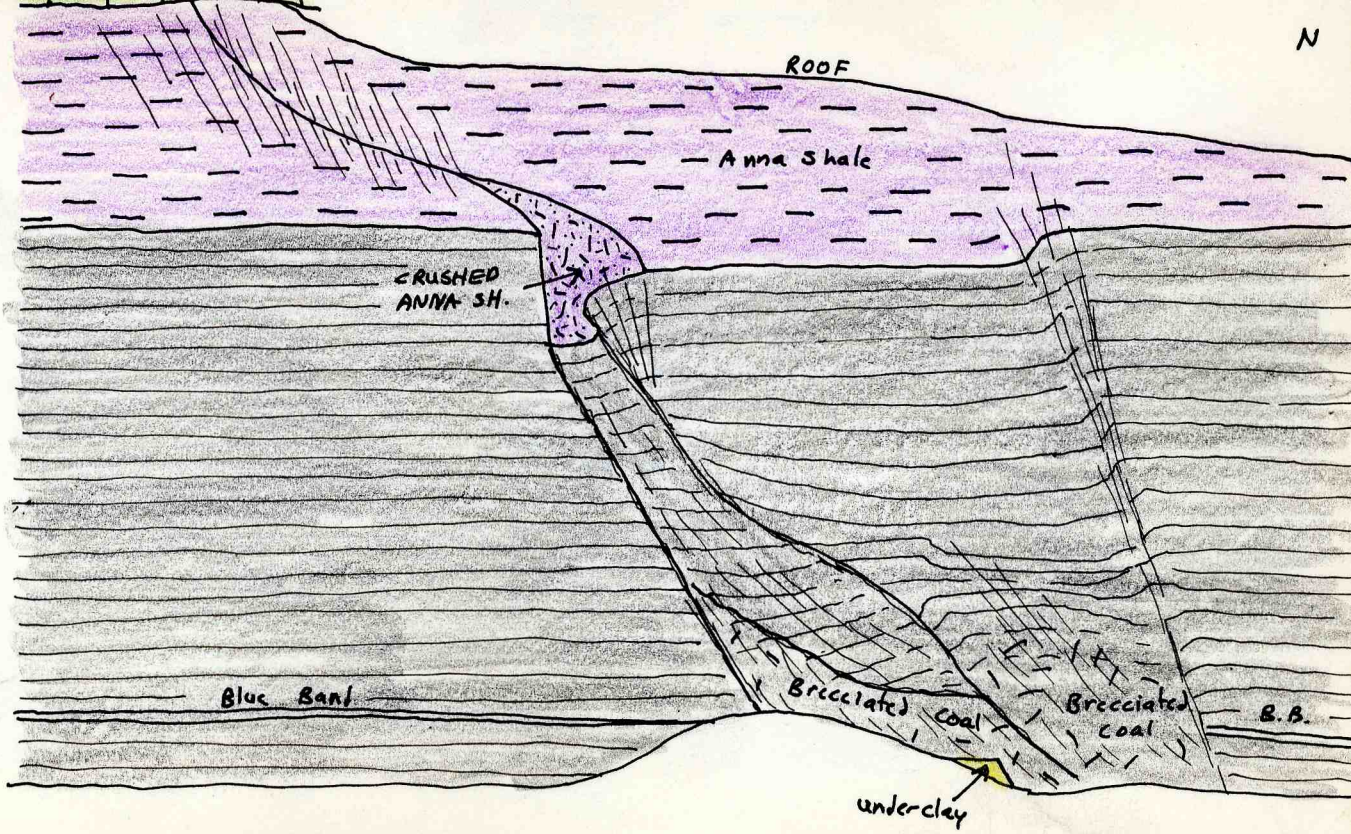
View Looking South



Location: Crosscut between 3rd and 4th Main South
Strike-slip fault

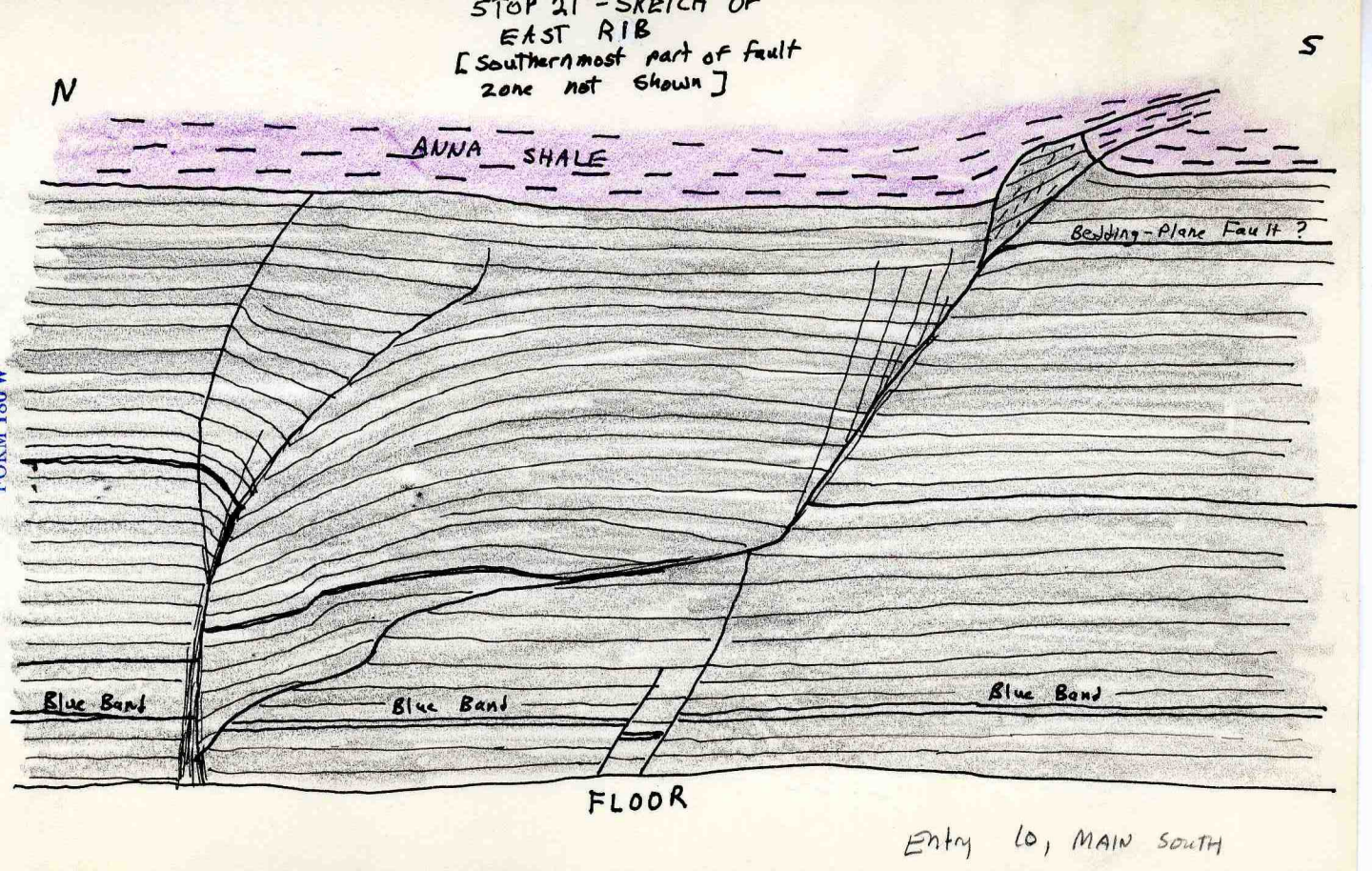
View Looking ESE Along Fault





ENTRY 10, MAIN SOUTH

STOP 21 - SKETCH OF
EAST RIB
[Southernmost part of fault
zone not shown]



Entry 10, MAIN SOUTH

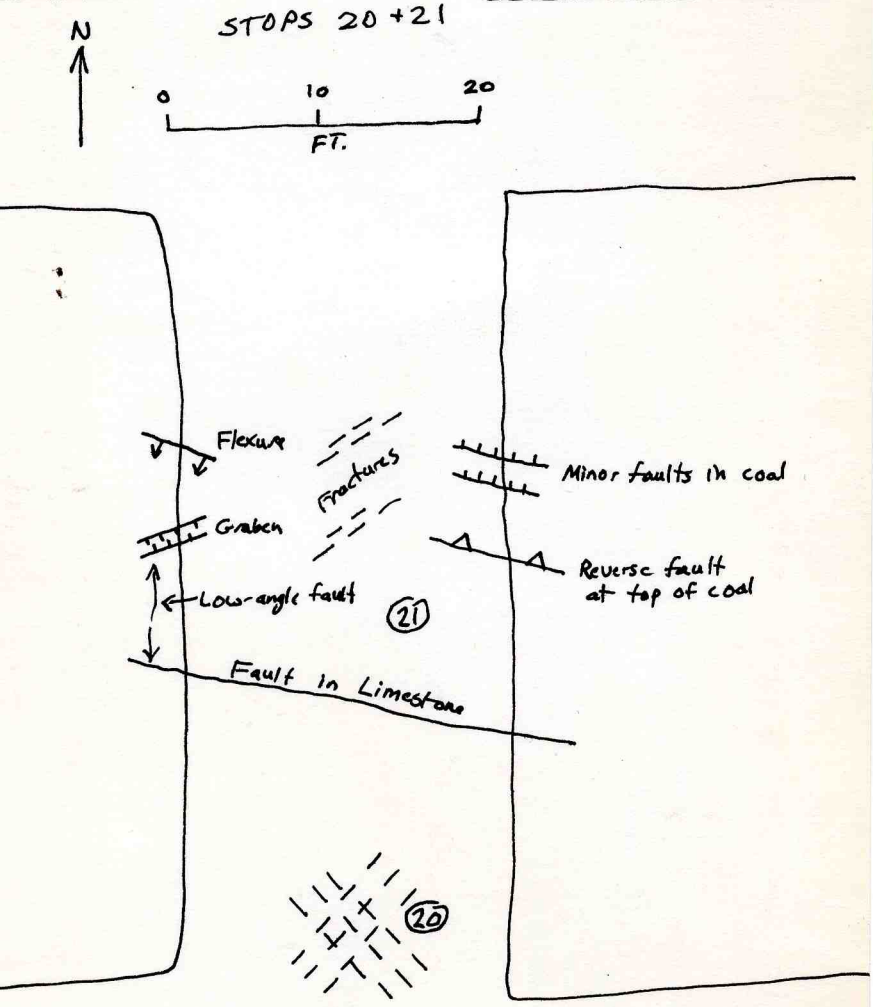
Throw on the fault is slightly less than the thickness of the coal seam, which is 8.0 feet. The Blue Band is 2.5 feet above the base of the seam.

20.) Jointing of coal and black shale is very intense, with the primary set 040/85 NW and the secondary set 135/85 SW. Locally the secondary set dominates. Many joints appear as open fractures with crushed rock or coal along their planes. A few penetrate the entire coal seam, though most do not. The inclination of the fractures appears to be the result of the wrenching movements here. Ordinary joints away from the strike-slip fault are vertical.

21.) Strike-slip fault zone on 10th Main South. On the east rib there are a number of small, branching dislocations in the coal, as sketched. The coal is locally crushed along the small faults, which dip northward at angles varying from nearly horizontal to nearly vertical. Other dislocations are flexures along which little or no offsetting has occured. The faults are mostly reverse faults, undoubtedly with a component of lateral movement which could not be determined. The faults and axial planes of folds strike NW or WNW. This direction of compression is consistent with left-lateral shear. Also consistent with sinistral movement are the prominent northeast-trending extensional fractures in the coal and roof.

On the west rib the lower part of the coal seam shows dislocations similar to those on the east rib. In places the coal is completely brecciated, with large and small fragments in a matrix of pulverized coal. At the top of the seam is a small graben, whose sides trend ENE and are nearly vertical. Slickensides observed on the south wall are nearly horizontal. Within the graben is brecciated Anna Shale. Above the graben the fault planes turn abruptly to a very shallow northward dip, and are traced as a zone of crushed shale. The amount and direction of displacement cannot be determined. The line of fracture in the limestone is quite

MAP VIEW
STOPS 20 + 21



definite and lies about five feet south of the graben at the top of the coal. Very little vertical offset has occured in the limestone.

So at this place, all three methods of failure; extensional, compressional, and wrenching, can be demonstrated.

22.) Irregular fracture in roof, trending about 140/50 NE, with the base of the limestone downthrown about 0.1 feet to the northeast (normal fault). There is no measurable offset in the coal, but the fault is traced there as a zone of steeply dipping, en echelon fractures. A thin zone of pulverized Anna Shale is also seen marking the trend of the fracture. This does not look like a compactional slip and probably is related to the strike-slip fault.

Joints in the shale are very closely-spaced and prominent here, especially the northeast-trending set. Several NE-trending fractures can be seen in the limestone also. Southward the fracturing continues to increase in intensity, and the fractures become inclined to the vertical, as at Stop 20.

23.) Area of very intensive fracturing of limestone, shale, and coal, just north of strike-slip fault. The primary fractures trend about 050 and may be vertical or steeply dipping. Small normal displacements are observed along several. Often they are spaced several to the inch in the coal and shale; more widely in the limestone. In places there are so many fractures that the coal appears pulverized. One fracture offsets the base of the limestone by 0.3'.

NW-striking fractures also are prominent and locally the coal is crushed along these also. And there are also a number of dipping fractures like that at Stop 22. These trend in a number of direction, but most commonly are parallel with one of the main sets of fractures. There are far too many fractures to map.

Roof conditions are naturally quite poor here, with the shale falling out as lath-shaped pieces, and very dangerous rashing ribs.

24.) Strike-slip fault in 11th South shows both extensional and compressional features. North of the fault zone the dominant fractures are extensional joints striking northeast. On several the coal is definitely offset, though this is often hard to determine due to rashing ribs. Similar fractures also occur south of and within the fault zone.

The faults themselves are similar to those at Stop 21; low-angle reverse faults with the north side upthrown. Two such faults are seen on each rib, but they cannot be connected across the entry. They trend a little south of east and appear to form an en echelon set.

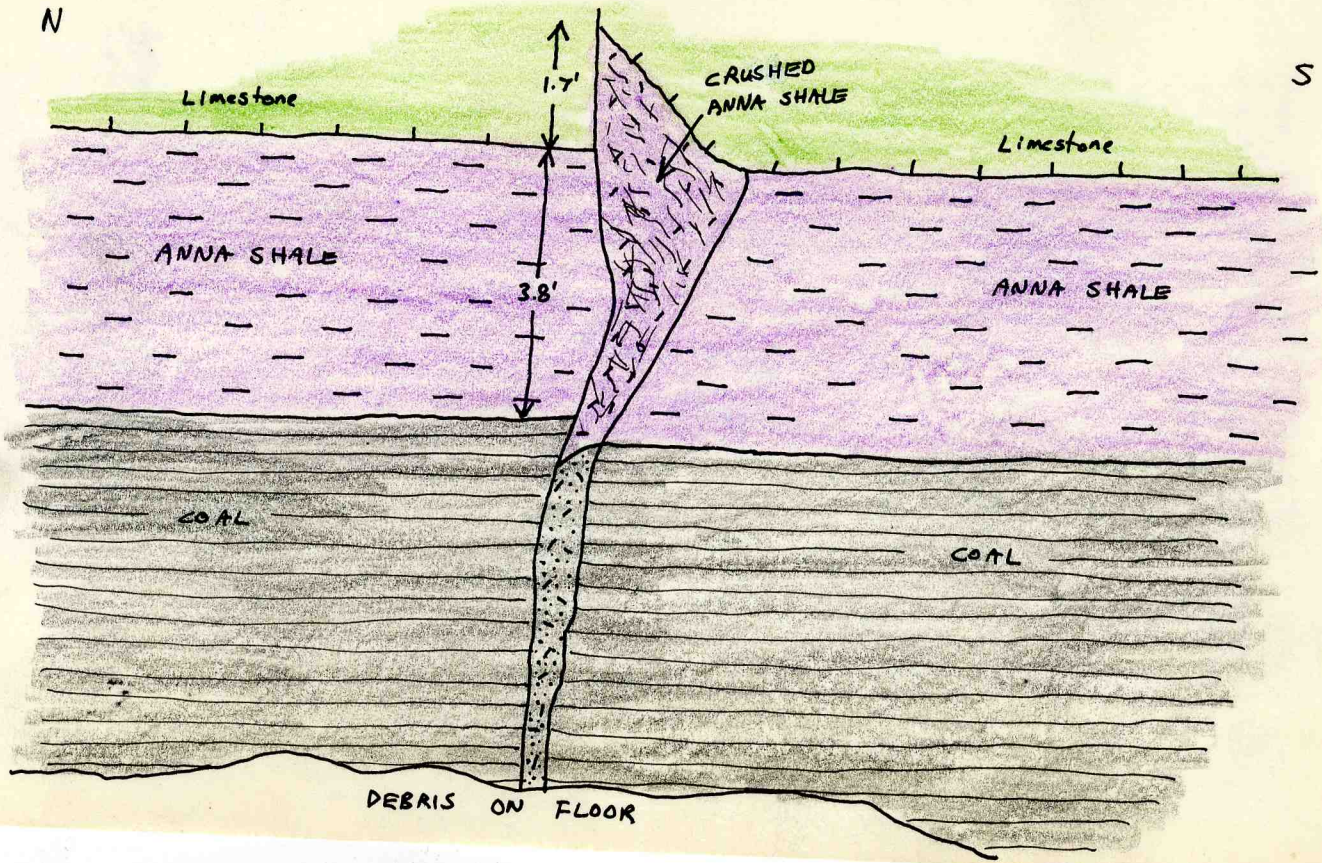
The faults become very shallow upwards into the Anna Shale, and locally they follow bedding planes. A wide zone of shale is crushed along them. The fault zone passes upward into the brow of the roof fall, and its intersection with the limestone is not visible. In the small area of limestone exposed north of the fault, many NE-striking fractures are present.

For sketch and additional information see my Note 17 of Jan. 12, 1978.

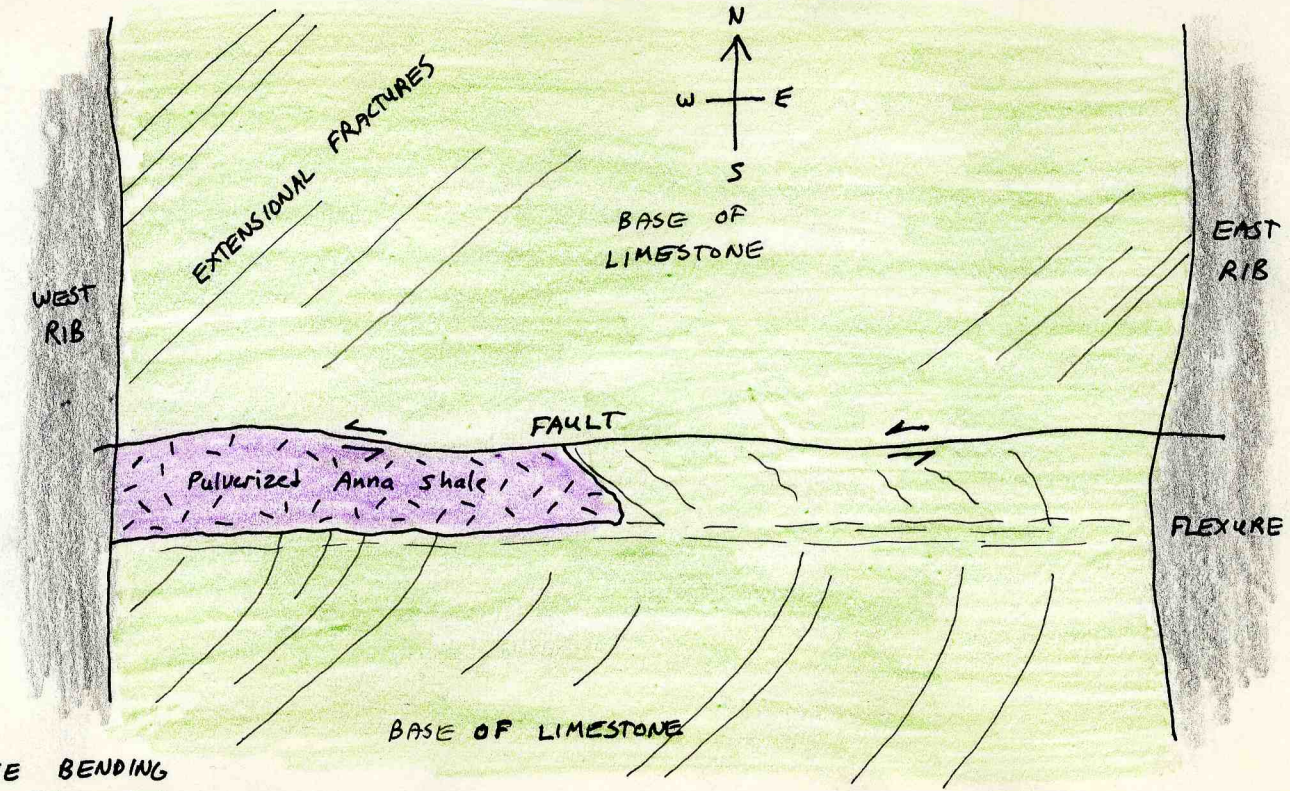
25.) Strike-slip fault zone in 12th Main South. This are area was formerly very wet, and detailed observation was not easy. Now the dripping was entirely stopped, and and the floor is drying out, but still muddy in places.

All Anna Shale has fallen, exposing the base of the limestone. North of the fault there are many NE-trending fractures, as before. Along several the base of the limestone definitely is offset; either the NW or the SE side may be downthrown. Generally the fractures split downward into many fractures in shale and coal. The coal is not appreciably offset but is very closely broken.

Entry 12, Main South.



VIEW LOOKING UP AT ROOF AT STOP 25



NOTE BENDING OF FRACTURES SOUTH OF FAULT.

The fault zone itself is marked in the coal by small reverse faults like those at Stops 21 and 24. The north side of these faults is upthrown by an amount varying fraom a fraction of an inch to a few inches at most. The faults strike south of east, but accurate orientations cannot be taken. The coal overall is less broken and folded than at Stops 21 and 24.

Here the fault zone extends vertically upward into the shale and limestone. There is a single sharp, slightly sinuous break in the limestone, trending due east. North of this fault the limestone is horizontal, but south of it the limestone is folded abruptly upward, by 1.7 feet on the east rib. The underlying shale is folded upward with the limestone, forming what looks like a horst, but is actually a sharp fold with a fault on one side. See sketch.

There is a suggestion of horizontal mullion on the fault in the limestone, and also a hint of left-lateral drag in the shale adjacent to the fault. The northeast-trending fractures in the limestone south of the fault appear to bend to a more northerly direction adjacent to the fault. This could be a result of drag along a left-lateral fault. However, I should note that the above are only impressions I receive and to some extent I may be seeing only what I am looking for.

This stop illustrates differing behavior of limestone, coal, and shale in the fault zone. Breaks in the limestone, both along the main fault and along NE-trending fractures, are sharp, nearly straight, and generally vertical. In contrast the shale and coal are broken by a multitude of fractures. The shale is not as brittle as the coal, as illustrated by more pronounced folding in the shale.

This makes sense in relation to the strengths of the various types of rocks. According to Bob Bauer, the following are typical tensile and compressive strengths for various rocks:

Rock	Compressive	Tensile
Brereton Ls.	14,250-28,500 PSI	1050-6600 PSI
Anna Shale	720-5728 PSI	310-764 PSI
Coal	1950-2440 PSI	99-171 PSI

This is unconfined axial compressive strength, and indirect tensile-test strength, perpendicular to bedding.

Limestone is considerably stronger, both in tension and in compression, than shale or coal. That is, a high stress is required to fracture it, and once it does fracture, further stress is more easily relieved by movement along the first fracture than by production of a new break.

All the rocks are much stronger in compression than in tension; frequently by a factor of 10 to 25. This fits with our observation that tensional fractures exist in wide belts on either side of the strike-slip fault zone, but compressional features are usually found only within the actual fault zone.

Some more theory: The overall trend of the strike-slip fault zone is slightly east of north, but in the Main South the zone strikes slightly south of east. As we have observed, the main faults are reverse faults, compressional in nature. In the 2nd Panel South where extensional fractures dominate, the zone trends east-northeast. In the 1st Panel South the zone strikes due east and shows nearly pure strike-slip movement.

Crown II

from The State Journal-Register (Springfield)
Thurs, June 28 (p. 21 or22)

Miner's death ruled accident

by Kitty Behof

An inspector for Freeman United Coal Co. in Virden — the site of a mining accident that killed an employee June 13 — testified Wednesday the victim was one of the most cautious employees he knew and the accident was simply a hazard of the job.

Leon David Brown, Girard, told coroner's jurors that Randy L. Reindl, 25, Virden, probably was struck on the left side of the back of the neck by a black slate as he used a drill that placed support bolts into the mine's walls.

Reindl died at St. John's Hospital about 9 p.m. from head and neck fractures and blood aspiration (choking).

The coroner's jury ruled the death was an accident.

Brown said the slate that probably struck Reindl weighed about 20 pounds.

Reindl was working as a roof bolter at the Freeman Crown No. 2 mine about 8 p.m. when the slate hit him.

The roof of the shaft Reindl and his partner, Randy Stephens, 22, Taylorville, were working in had recently caved in, according to testimony.

The fallen rock had been scooped out and the two went in, looking for loose rock on the mine's walls. The two men removed the loose slate and returned to the tunnel to work a machine that places bolts into the walls to support the mine.

"I had put a pin in the machine and drilled a hole and I was starting on my second one," Stephens testified.

"Randy had started putting in his first one. He started drilling through a piece that was hanging out and it broke lose," Stephens said.

"We worked as safe as we could. There's no good top (slate and rock). There's just some better than others. It's one of he hazards of working in a mine," Stephens said.

This is the 2nd fatality at Crown II; it* and the previous one in 1st S. panel were due to falling Anna ("black slate") shale.

*we have not mapped this site - pjd
could be different? Yes, see later notes

FREEMAN UNITED COAL MINING CO. CROWN II MINE
June 26-27, 1979
Notes by John Nelson, mapping with Phil De Maris

Mapping in the 2nd North Panel off the Main East, in the area of the channel in the roof, as studied previously in the Main North and 1st North Panel. Map is included; refer to map for location of stops.

The panel is now fully mined out, but will not be sealed for several months, according to Hap Combs.

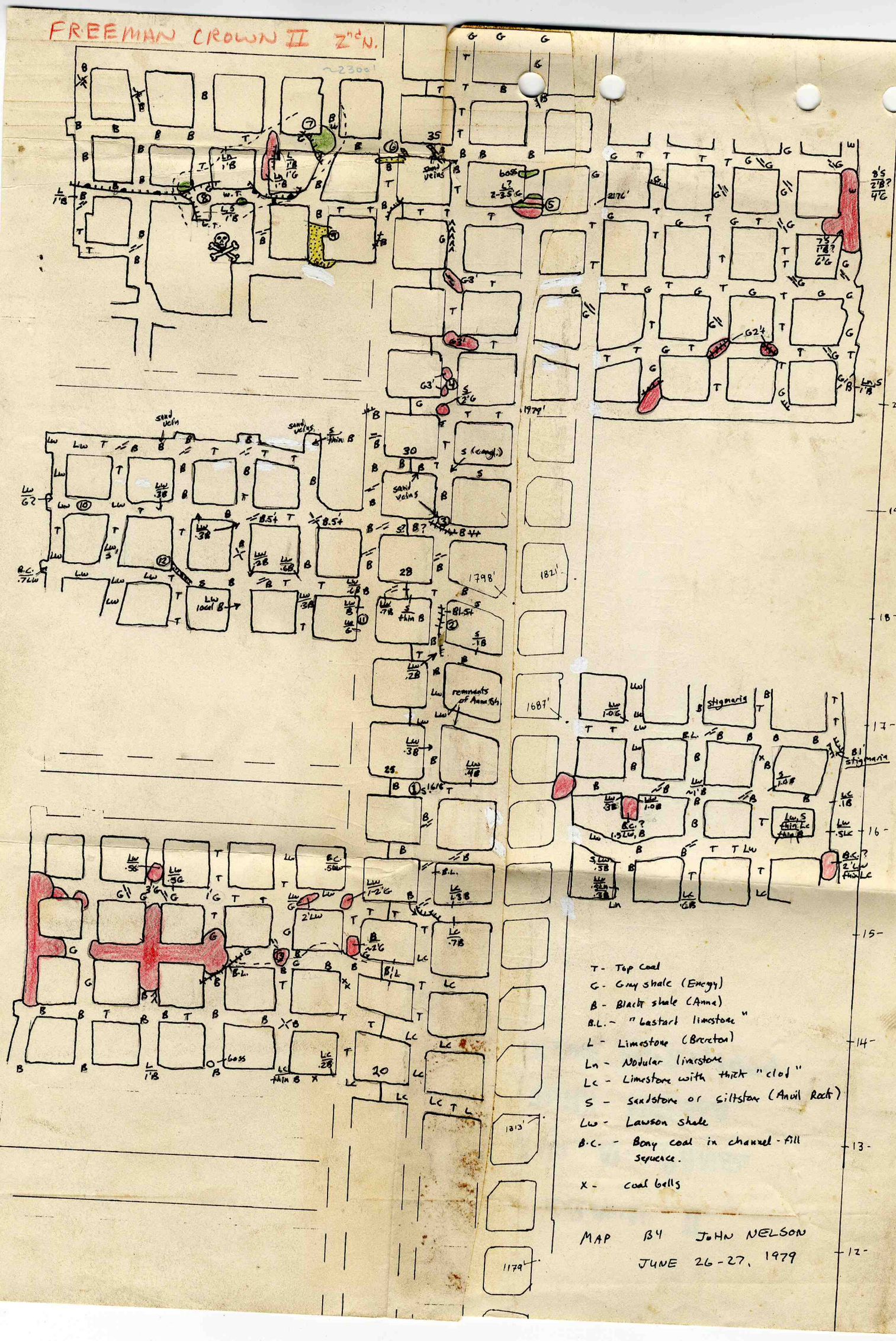
1.) Southernmost appearance of the channel in the belt entry is at Room 25, survey tag 1618'. The immediate roof of Anna Shale is locally eroded. Only the base of the channel-fill can be seen. It is a hard rock, probably sandstone, with coarse mica and thin layers of very carbonaceous shale and bony coal. In the crosscut to the east is a better exposure, with dark gray, silty, micaceous shale overlying a few inches on Anna Shale.

2.) Unusual sedimentary features along an irregular, north-trending slip. An unusual facies of the Anna Shale is present. It contains a very large amount of coarse carbonaceous material, fragments of fusain, and Stigmaria. Along the east rib the top layers of the coal are split, and the black shale interfingers with the coal. A zone of hard, concretionary limestone is developed along the slips. The Anna Shale flanking the slips is carbonaceous, flaky, and contains orange fragments.

This black shale resembles "bastard limestone" as seen in a number of other mines. The structure most nearly resembles the features called "wash-outs" at the Hillsboro Mine.

The Anvil Rock Sandstone and Lawson Shale are not exposed here, even though they lie directly on the coal both to the north and south. The Anna Shale is about 1.5 feet thick along the "wash-out".

FREEMAN CROWN II 2nd N.



T - Top Coal
C - Gray shale (Energy)
B - Black shale (Anna)
B.L. - "bastard limestone"
L - Limestone (Brereton)
Ln - Nodular limestone
Lc - Limestone with thick "clod"
S - Sandstone or siltstone (Anvil Rock)
Lw - Lawson shale
B.C. - Bony coal in channel-fill sequence.
X - Coal balls

MAP BY JOHN NELSON
JUNE 26-27, 1979

3.) Another "wash-out" like that at Stop 2, but less well exposed. This one trends nearly east-west. The same features, including flaky, carbonaceous Anna Shale with orange-colored fossil (?) fragments, a zone of concretionary limestone along the slips, and minor splitting of the coal adjacent to the structure, are seen.

Near the northwest corner of the intersection and not far from the "wash-out", two narrow irregular dikes or veins filled with light-colored sandy material penetrate the Anna Shale, ending just above the coal. The sand in them probably was injected from the overlying Anvil Rock Sandstone, which is not visible in the exposure. See Phil's Note H.

4.) Series of falls exposes gray shale, and at the south edge, very hard micaceous sandstone. The sandstone lies directly on the coal at the southwest corner of the intersection. Northward it rises above the gray shale and is lost in the roof. Since the gray shale contains no visible mica, plant debris, sand, or silt, I conclude that it is Energy Shale deposited prior to cutting of the channel.

5.) Roof fall in gray shale. The top of the fall is a hard rock, either limestone or sandstone. It is too high and too solid to allow breaking off samples. Two parallel, linear "bosses" are seen in the fall, cutting into the underlying gray shale. One is fully exposed near the center of the fall and the other lies along the north edge of the fall. The fully exposed one is 5 to 6 feet wide and crosses the entire fall with little variation in width. The gray shale is pushed down and deformed beneath both "bosses", and small veins filled with light gray sandy material extend downward.

The gray shale is 2 to 3½ feet thick, poorly bedded, and not micaceous. The upper portion grades

to black shale (Anna ?)

Another east-trending "boss" occurs about 12 feet north of the fall and this one nearly reaches the top of the coal. The lower surface is irregular and extremely hard; cannot be broken. Sandy material is present but we cannot tell if the main mass of the "boss" is sandstone or limestone.

6.) East-trending "boss" on line with the one just described above. (No "boss" was observed in the belt entry, but there was a small sand vein in the black shale there). This "boss" definitely is composed at least in part of light gray, fine-grained, micaceous sandstone. It contains concretions of very hard, dense pyritic sandy limestone or calcareous sandstone. A number of small dikes and veinlets of sand penetrate the Anna Shale along the "boss".

In the crosscut (Room 35 just west of belt entry) two smaller, narrow, linear bosses trending northwest are seen. Both are deeper than they are wide and so could be referred to as dikes. They end just at the t top of the coal. The filling is hard to describe; appears to be deeply weathered dark, nodular rock with a gritty texture. There is definitely sandstone in small associated veinlets. Both "bosses" die out along strike in the crosscut and are not seen farther north.

7.) Another large "boss", nearly round in plan view, and displacing the top of the coal. Although it is nearly on line with the structures at Stops 5 and 6, this "boss" appears to be simply an "ordinary" limestone "boss". Associated with it are "white-top", clay-dike faults, and deformation of the shale and coal below. The lower surface of the "boss" consists of sandy shale with nodules of hard, pyritic limestone. Its interior cannot be seen.

8.) Typical association of features as seen throughout the mine. "White-top", clay-dike faults, low-angle shear fractures, thin irregular pods of gray shale, thin phosphatic non-fissile Anna Shale, nodular and "bossy" limestone, and bad roof conditions, with water seepage. No indications of either channel sandstones or of the sandstone-filled "bosses" of Stops 5 and 6. Really?! - you are under an Anvil Rock channel!

9.)Major slump structure with channel-fill sandstone Features are typical of other such structures in the Main North and 1st North Panel, and distinctly different from the "bosses" at Stops 7 and 8. The sandstone is light gray, fine-grained, hard, massive, with no variation in texture apparent. No limestone is present. The lower conatct of the sandstone is sharp, undulatory, and erosional. The Anna Shale is pinched out in places, and generally much deformed, with widespread injection of sand between layers. The coal is deformed, but not eroded. The sandstone makes very solid and generally dry roof. This slump is somewhat elongate east-to-west but is not seen in either adjacent crosscut.

10.) Indications here of a very slight erosion of the top layers of the Herrin Coal. The immediate roof is mainly shale, with lenses and laminae of sandstone, and well-preserved plant impressions, including Neuropteris and other compound leaves. The contact of shale to coal gently undulates and there appears to be some very low-angle truncation of layers in the coal. Definite scour is seen on the east rib, underneath a small sandy lens.

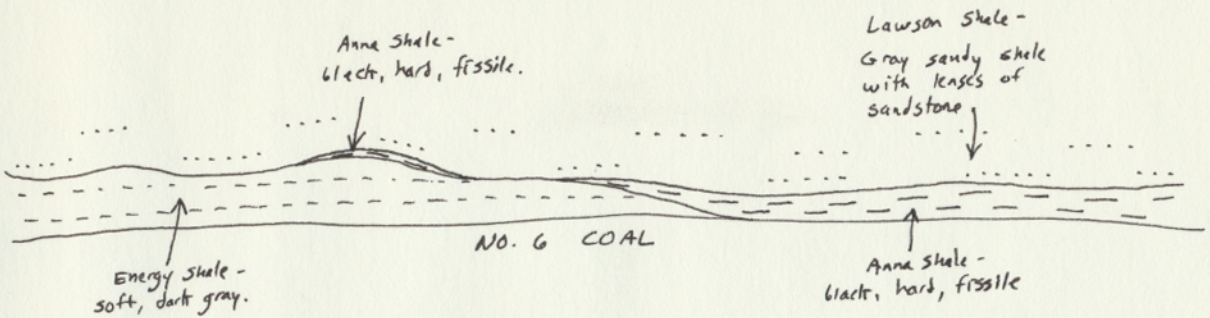
11.) Interesting exposure on the west rib (see sketch). A pod of gray shale is overlapped by Anna Shale, and both are eroded with sandy shale above the unconformity.

Stop 11

Width of view about 15 feet

S

N



12.) Good view of a "wash-out" (see Notes 2 and 3). Here the top of the "wash-out" is eroded and overlain by silty shale. On the northwest corner of the intersection the interfingering of coal and black, carbonaceous shale is quite apparent. The splitting is really quite minor; only the top few inches of the seam are affected. The shale is very bony, almost a coal, and contains abundant large pieces of fusain. Pyrite is abundant, along with what appear to be shell fragments. A series of irregular slips mark the southeastwrd course of the "wash-out". The erosion at the top is very irregular, with veinlets of sandy material intruding the "wash-out". The Anna Shale is carbonaceous and contains orange shell fragments (?) for some distance to either side of the structure.

13.) Roof fall, about two feet high, exposes edge of a lens of gray shale. The Anna Shale above the gray shale is in the "wash-out" facies, but no actual "wash-out" can be seen. The Anna Shale is soft, brittle, flaky, very carbonaceous, well-jointed, and contains definite fossils, including gastropods, pelecypods, and cephalopods. The channel-fill units are not seen here.

14.) Large area on Energy Shale roof. Predominant jointing is northwest, perpendicular to the usual jointing in most of the mine, and to the jointing in the Anna Shale in this part of the mine. These joints contribute to slabby failure of the immediate roof.

Mine Notes - Freeman Crown II-Macoupin Co.

Trip: June 27-8 by Phil DeMaris and John Nelson (179)

Coverage: Mapping in 2nd N. Panel
Samples CII-I-1 to -16 (complete)

Mapping in the 2nd N. panel (Anvil Rock ch.)

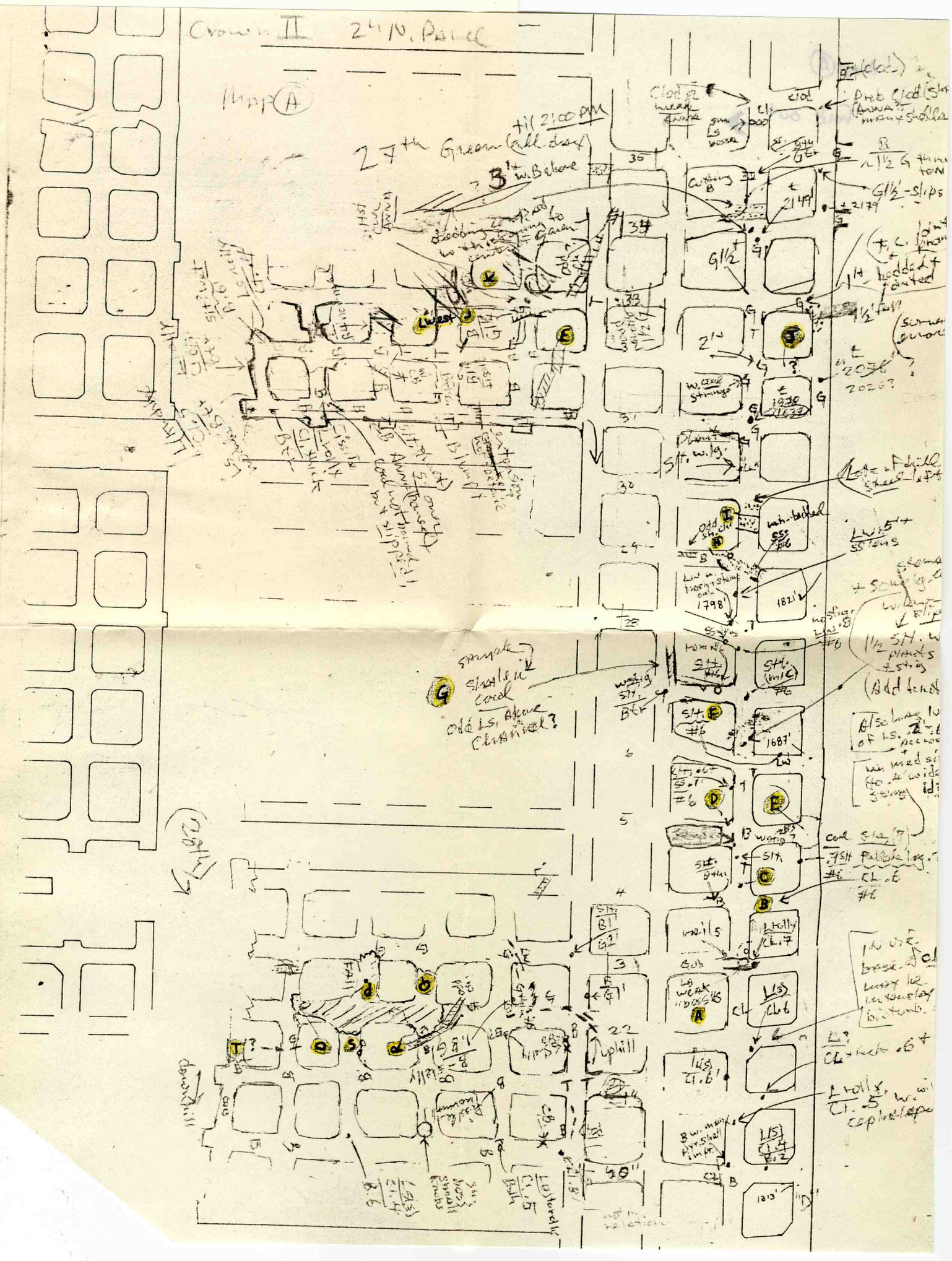
"Hap" Combs informed us that " the 1st N. panel will be sealed in a week, the 2nd N. panel will be open about 6 months, and the 3rd N, panel has just started." John and I plan to recce.-map most or all of the A.R. channel-effected area in the panel; we began at the 20th cross-cut on the "C" and "D" entries.

A. Ls. (base of Brereton) is no longer just "rolly", it is "knobby"; a weak "boss" here has nodules projecting from the which are 2 to 8 cm. across. The "clod" is highly disturbed - it is squeezed down and contorted with some coal, around the base of the protruberances.

B. We go "uphill" about 3' (t.c. in entry) to an exposure in C.C. of carb. siltstone ("Lw") over a channel lag deposit of siltstone and limestone pebbles (-I-1). Just to the E., there are bioturbation traces below the siltstone with Ss. lenses which go into the clod* which is 0.5' here. The traces are 4-6 mm. wide, narrower at the top, average 12 cm. deep, the longest being 16 cm. They are commonly 30-50° from the vertical, and are limited in distrib. to the "clod" immed. below channel-fill units. (Lingula?) This bioturbation indicates the "clod" was again a "soft" sediment, suitable for burrowing. Sketch - - - - - - - -

* i.e. basal shale of Brereton was uneroded here. P.J.D.

Map A June 27-8, '79



C. Thin C.B. in t.c.; related to channel? Has the typical form of plant material; Remember P.R.J.'s comments on lignitic material in the coal? Perhaps these are A.R. channel-aged coal balls of lignitic material; in the N. Mains they seemed to be weathered-out; should be sampled.

D. Section:

coal, unnamed
siltstone (Lw) 0.5'
Ss., coarse grained lag 0.1'
B trace
#6

E. Excellent exposure to Banksťon Fk & ? (desc. from top)

- Siltstone, 2' seen, no bedding, is dk. gray with greenish mottle, has syneresis cracks.

- Limestone, benched, 2½-3' thick, nodular bedded, coarse grained, has fossil frags and shale pebbles, some are angular. Between nodular beds is a dk. shale, micaceous & carb., not unlike Lawson sh.; poorly bedded w. sm. Ls. nodules.

- Silty shale, carb., laminated, gray, 0.7' thick

- Coal, unnamed; 1.4' thick, basal .3-.4' is br. banded, rest rather "boney"

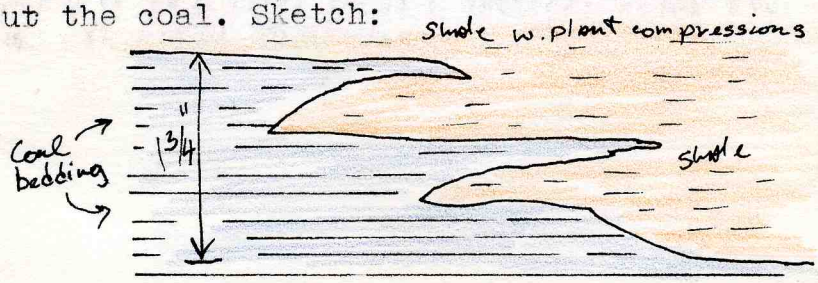
- Siltstone, 0.3'; gray with many plant parts and one small Brereton Ls. nodule; wavy, erosional contact to:

- Anna Shale, fissile & black, 0.5' here, but 1' thick w. A/C's locally.

-#6 Coal

On the N. side of the fall, the Anna is lost to eros. entirely, and the "Lw" (silty shale w. plants) is over 1' thick. Syneresis is highly developed in the top-most unit (benching shale of the Bk.Fork??) with master cracks on .3 -.5' centers and fine cracks nearly every .05'. Samples were taken of the Ls. and the mottled shale (-I-2 to -I-4). On NW corner of fall, a very dk, carb. shale is interbedded with the top of the #6; contains sm. pyritic lenses; must be a drainage-way in the swamp. Produces only a slight "high" in the seam; no major slip; easily missed (Exposure later clarified; see note G; features mapped on field map as xxxx)

F. Clear, though small, amount of erosion of the Herrin #6; 0.15' loss; coal behaved pliably; exposure is roughly transverse to the flow of sm. channel which cut out the coal. Sketch:



G. Shale body contemp. with the top of #6 deposition; coal grades laterally to shaley coal and then carb. shale , and back again. Sample taken; locally there is "bastard Ls." in the top or on the top of the #6 above this material.

H. On the W. limb of a Ss. channel(et); it (ch.) underlies slightly Anna sh., prob. through soft-sed. deformation. Also an Anna conc.(A/C) is completely isolated within the Ss. in the roof here; is 16" X 23"; would be nice photo.

I. Ss. channelet cutting Anna Sh. (Sample -I-6) for thin section.

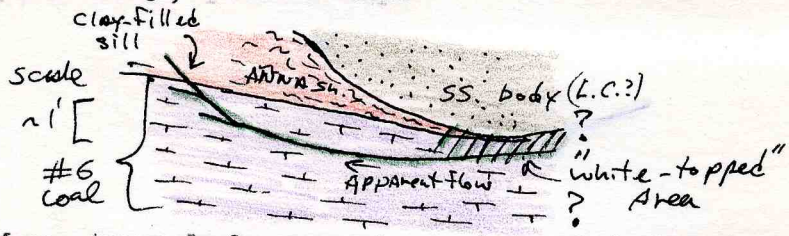
J. Prob. coal ball at top of #6; it has rough "wood" appearance; (-I-7); above it (or top portion) is a grainy, hard material (thought to be Ss. at the time) which is calc. or dolomitic & not Ss. by test. (See note C) Sample -I-8; petrographic (#) and X-ray tests run: See sample section.

K. Large Ss. lead structure which is slightly elongated E-W (with flow) comes down 1½' below the "normal" top of the #6. Anna shale and #6 coal are "white-topped". On the S. side, W.-T.'ed coal is present nearly 4' along Anna/coal contact; Anna is only recog. roof unit; was being eroded just prior to deposition.

L. "White-top" effect on Anna and top coal (#6) extends back 8' from source of material (away fr.center of the coad structure); injection planes are distinct in Anna, and are seen to cross bedding.

L(west) "White-top" material in coal sampled (-I-9); it has traveled laterally in upper 1' of coal on bedding planes; it then branches upward (Pressure phenom.?) Sketch:

(over) See also p. 7 – from vic. of L + L(west)



Max. travel from prob. point of injection is 12' (seen). Sampled material is from a 1" vein, 1.2' deep in the coal.(-I-9)

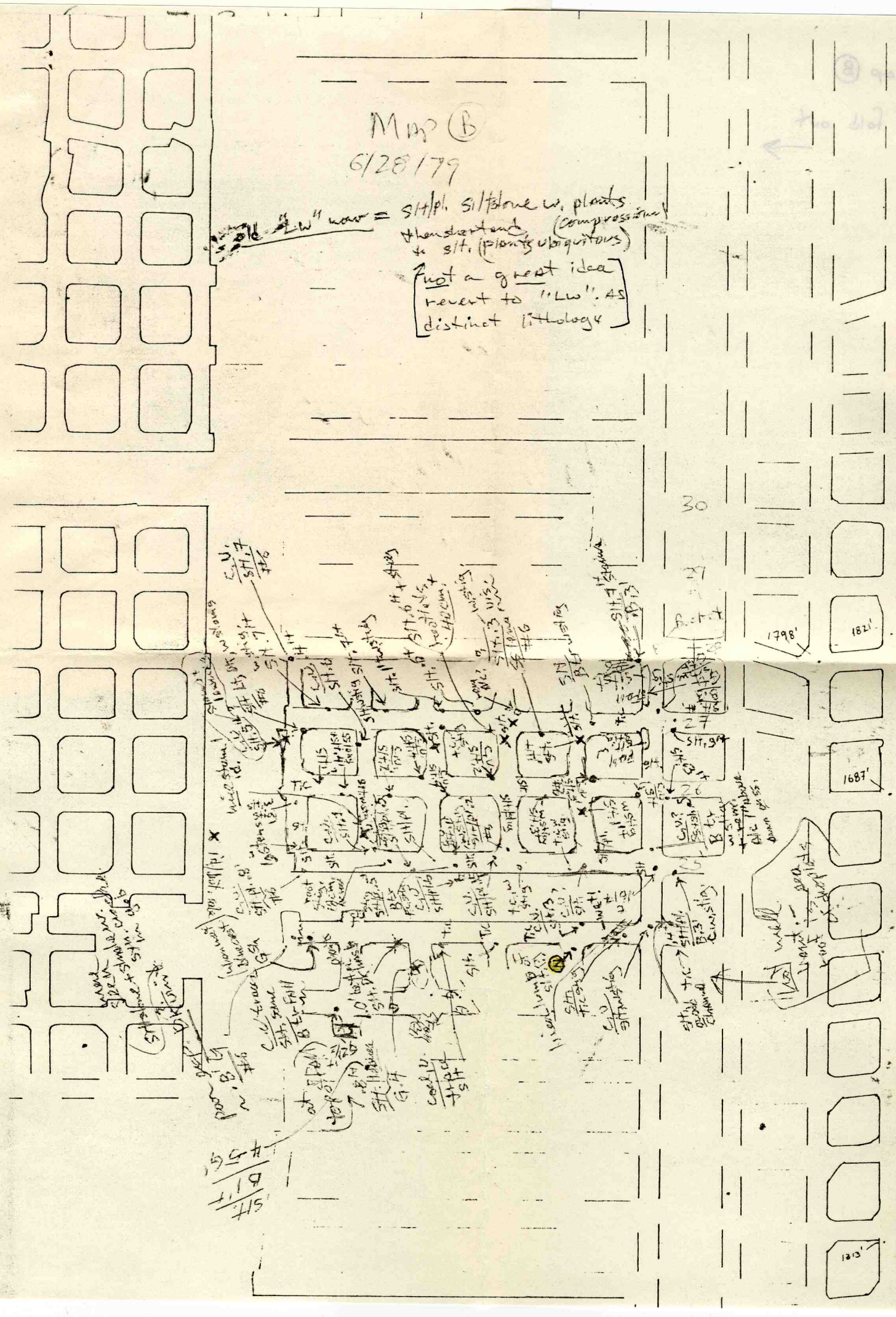
M. Odd channel(et) in top coal;"boney" shale in t.c. w. fusain?; also contains shells inc. coiled gast.(Ceph.?) and brachiopods; some sm. slips (faults) in assoc.; material grades laterally to coal in both directions. (see also note G.)

Day 2: Noted on posted map that work was continuing on the 2nd S. panel where they are working up to the normal F. at the S. end of the panel; they will eventually have to deal with the strike-slip fault as they retreat to the North.

N.(Map B.) Finely-banded Ss. on #6 coal is 0.2' thick; grades upward to finely banded siltstone (w. stigmaria) 0.8' thick & fairly dark; then unnamed coal. Base of the Ss. was sampled (-I-10) and the carbonaceous banded siltstone 1" above was also sampled (particle size anal); (-I-11)

O.(Map A) Large Fall; some Anna still present below sharp, eros. contact t to lt. gray siltstone ("LW"); good est. of 10' thickness. We don't know where we are in terms of channel vs. sheet phase of Anvil Rock ss., so these exposures are noteworthy; sample (-I-12) taken for part. size anal. (EITHER Energy was mistaken for Anna, or Energy shale was missed; roof is Energy (thin?) here.

Map B June 27-8, '79



P. Another large fall; flat-topped (Ls.?) (top to bottom)

Competent unit, slightly irreg. base (prob. base upper bench Bnk. Fork)
ca. 5' soft, mottled, shale.
ca. 1' brownish gray, nodular Ls.(prob.)
ca. 6' siltstone, med. lt. gray, finely micaceous, hard, poorly bedded to massive. Irreg. contact to;
ca. 4' shale, dk, gray finely silty, poorly bedded (Energy Shale)
#6 coal (NO Anna shale present)
Siltstone unit sampled (-I-13); Energy sh. is wet and weathering typical orange-brown; yellow on fractures.

Q. Poor exposure; siltstone has come down as a block. Siltstone is thinly lam. at base- less so upward. Estimated 4' Energy shale with some Anna present.

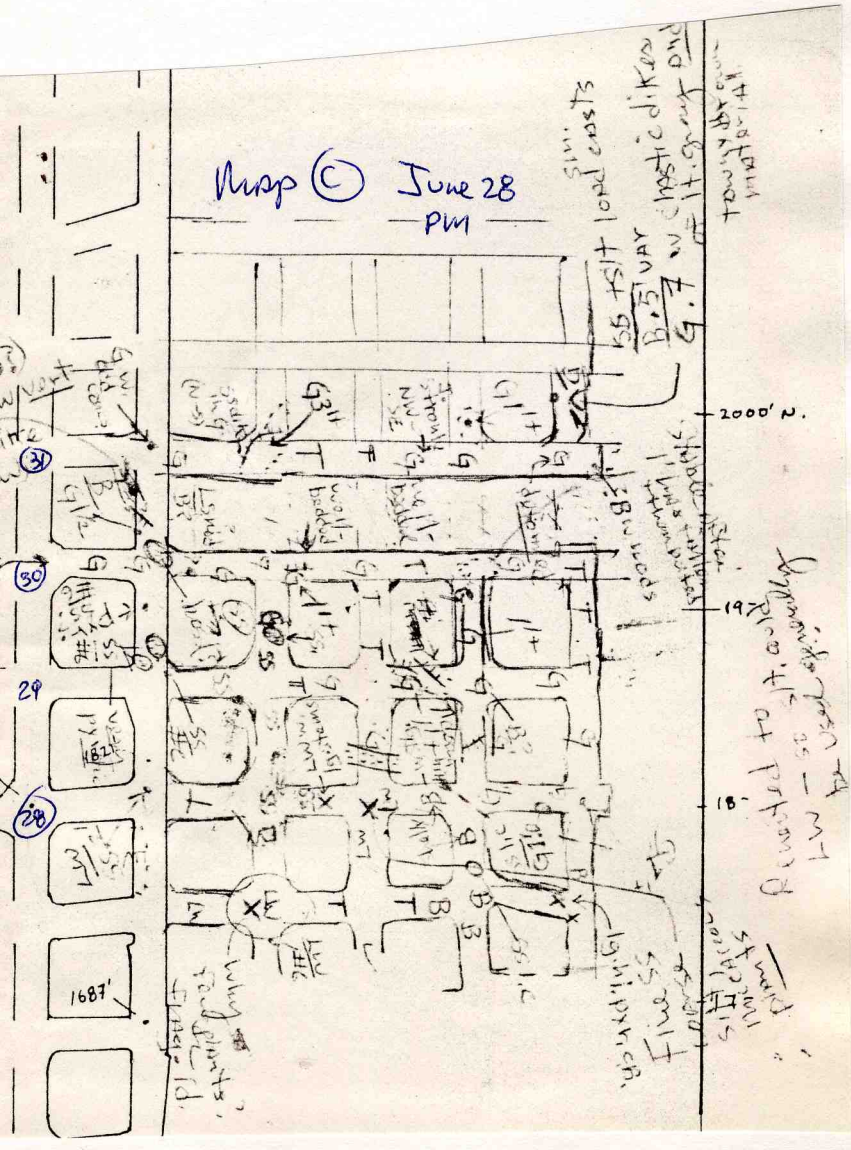
R. Fall; siltsstone not as well laminated as on N. side (only obs. on fall); Odd channel is Ls. here ; rests on #6 and into base of Anna (I believe by deformation). Features are puzzling, but they are linear and can be tracked at the top of seam; small piece of Ls. "cigar" sampled here (-I-14).

S. Basal silty shale is darker, ½' thick; is irreg. finely laminated with thinly laminated lt-to-med. gray silty shale above- sampled (-I-15).

T. Fall with high exposures; lith. judged from fallen pieces:

Top is flat, slightly irreg. surface (Prob. upper bench of Bankston Fork Ls)

Nusp C June 27-B, '79



- ca. 3' mottled shale
- ca. 1' brown limestone, undercut by fall
- ca. 10' silty shale & siltstone, med. light gray; upper part not laminated, lower part thinly laminated. Sharp contact to:
- 1 to 1½'(var.) coarsely nodular Brereton ls.; some "flow" appearance around a nodule.
- 1½ to 2' (var.) Anna, fissile
- #6 coal

(Some ident. from fallen material)
Brownish gray ls. (Lower bench Bankston(?)) was sampled (-I-16); has some carb. fragments.

Addenda; a 2' vertical Ss. dike under a load cast (I believe in vic. of site L) in Anna does not enter coal; it interfaces with coal by creating a small goat beard at the top of the coal.

(See Map C) After lunch we mapped of the E. side of the panel; no book notes (Nelson kept me moving)-several more "botanical" sites were noted for future visits.

Sample Set "I" (complete)

C2-I-1 Channel lag with Ls. pebbles; "white" is up. Site B, day 1.

C2-I-2 Ls.; white on horz. plane; site E.

C2-I-3 Ls. from site E.

C2-I-4 Mottled shale w. syneresis cracks from site E.

C2-I-5 Odd shale in #6, grads laterally to boney coal; site G.

8 of 8, 3 maps

-I-6 Ss. channelet on Anna sh.; site I.

-I-7 Prob. coal ball from top of #6 from under X-8; partly coalified.

-I-8 Granular Ls. over -I-7 (dolomite? Yes has weak fizz); is carbonaceous. - organic dolomite spheres in calc.+ pyr. matrix.

See P

-I-9 "White top" material from 1.2' deep into coal; for particle size analysis & clay min. Day 1 (last) Site L(west).

-I-10 Banded Ss. on #6 for thin section. Site N. (Day 2)

-I-11 Banded Ss./siltstone for part. size anal.; 1" above -I-10 (site N.)

-I-12 Lt. gray, well laminated siltstone above Anna.Site O.; for particle size anal.

-I-13 Med. gray unlaminated siltstone; particle size anal; site P.

-I-14 Ls. from Odd channel (washout?) at T.C. and into base of Anna, Site R.

-I-15 Thinly lam. siltstone; site S.

-I-16 Ls. brownish gray w. carb. fragments from site T.

END JUNE 30, '79

(See Vol. II for later dates)

INTRO. to V.II

Mine Notes; Crown II; Project Status

Comprehensive mapping has been over for 1½ years; monitoring of piesiometers ended during the winter of '78 & hydrologists have made some sort of final report to the mine; we did not receive it. I received it in Nov. '79

Current projects include work by DeMaris and Nelson on the Anvil Rock Channel in the northern half of the mine and work by Nelson on the strike-slip fault zones which pass through the mine.

Projects concluded (in whole or part) include the IX-ICC Field Trip run in May which sucessfully examined many unambiguous exposures in the S. Mains, and an IX-ICC paper by DeMaris, DiMichele & Nelson on the paleoecology of the channel (An. Rock) sediment; ms. is under revision & wil prob. be published in ~~1980~~. (not published in that form)

Future projects pending include planned within seam stratigraphy of #6 (coal thicknesses & shale partings); Crown II may also be a sample site by Russell, et al for post-dep. environment influence on coal quality. (Ph.D. Thesis work)

Phil DeMaris
Sept 25, 1979.

See Project Status update of 1/81, this volume.

July - Dec.'79

Mine Notes - Freeman Crown II, Macoupin Co.

Trip: Sept. 19, 1979 by Phil DeMaris

Coverage: 2nd N. Panel mapping
Samples; Set J begun

2nd N. Panel mapping

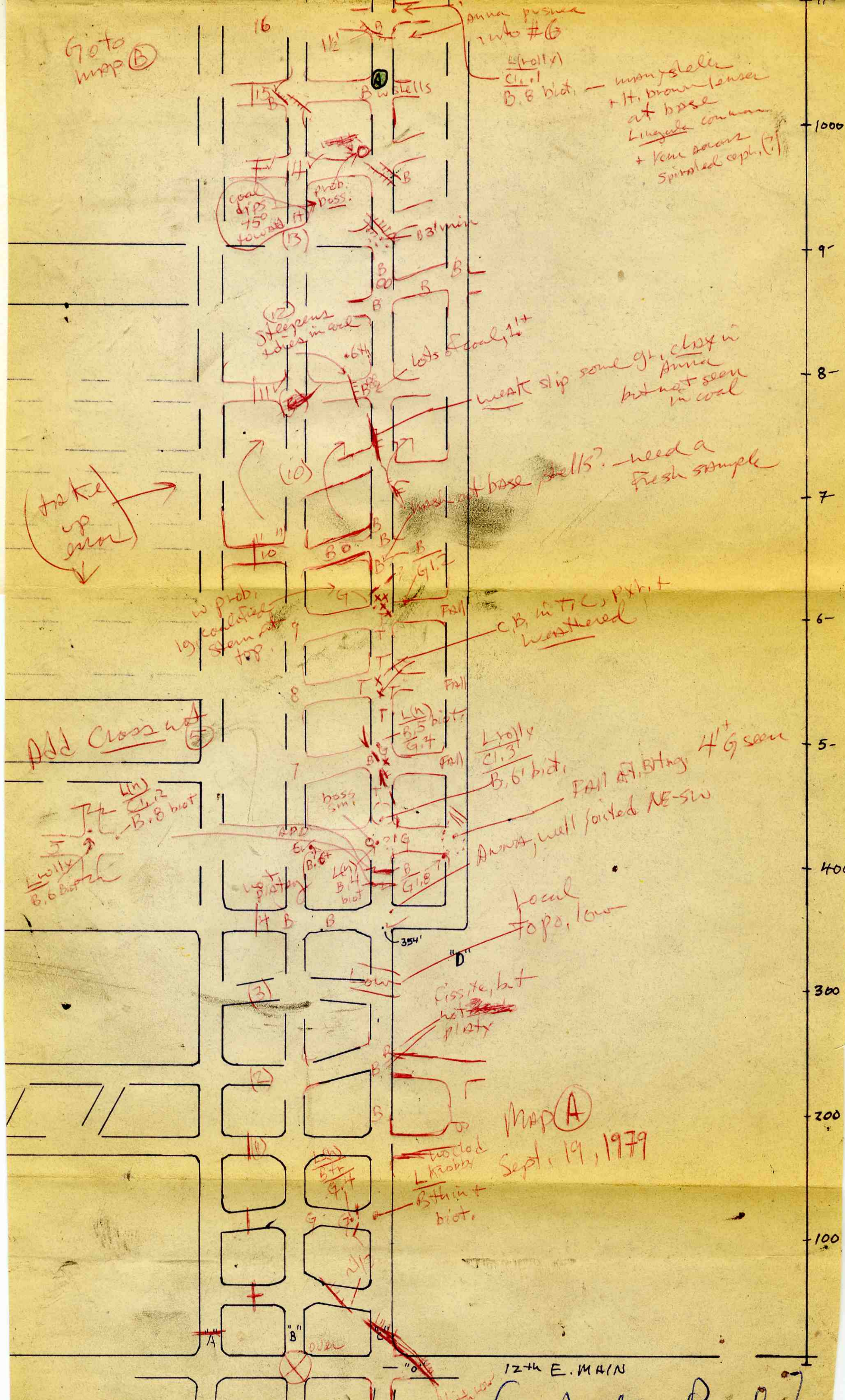
I mapped the travelway of the panel on the way in (see map A) because there are several nice falls there, etc.

A. (See map A) At the 15th.c.c., saw odd Anna shale with lots of shells. I sampled a Lingula and a brach. with 2 prom. teeth at the hinge (productid?). Some wood (vascular plant material, at least) is also present in Anna at the same stratigraphic position; several are coalified. Shells are abundant at some planes; some appear phosphatized whole; collection is a problem.

B. Now on Map B; very interesting A.R. Channel exposure at corner (bottom up desc.)

#6 coal
Clod, 0.20' thick(loc. 0.4' thick)
Ss., fine, unconformably on the clod; micaceous, lt. gray., .05' thick.
Sltstone 1.50', light gray with many coalified compressions; weathers yellow, esp. around stigmaria rootlets at top.
Upper coal, 0.3' plus:-bone coal made up at base of many med-sized stems/petioles(0.3' - 1.0' wide) which range to 3' long.

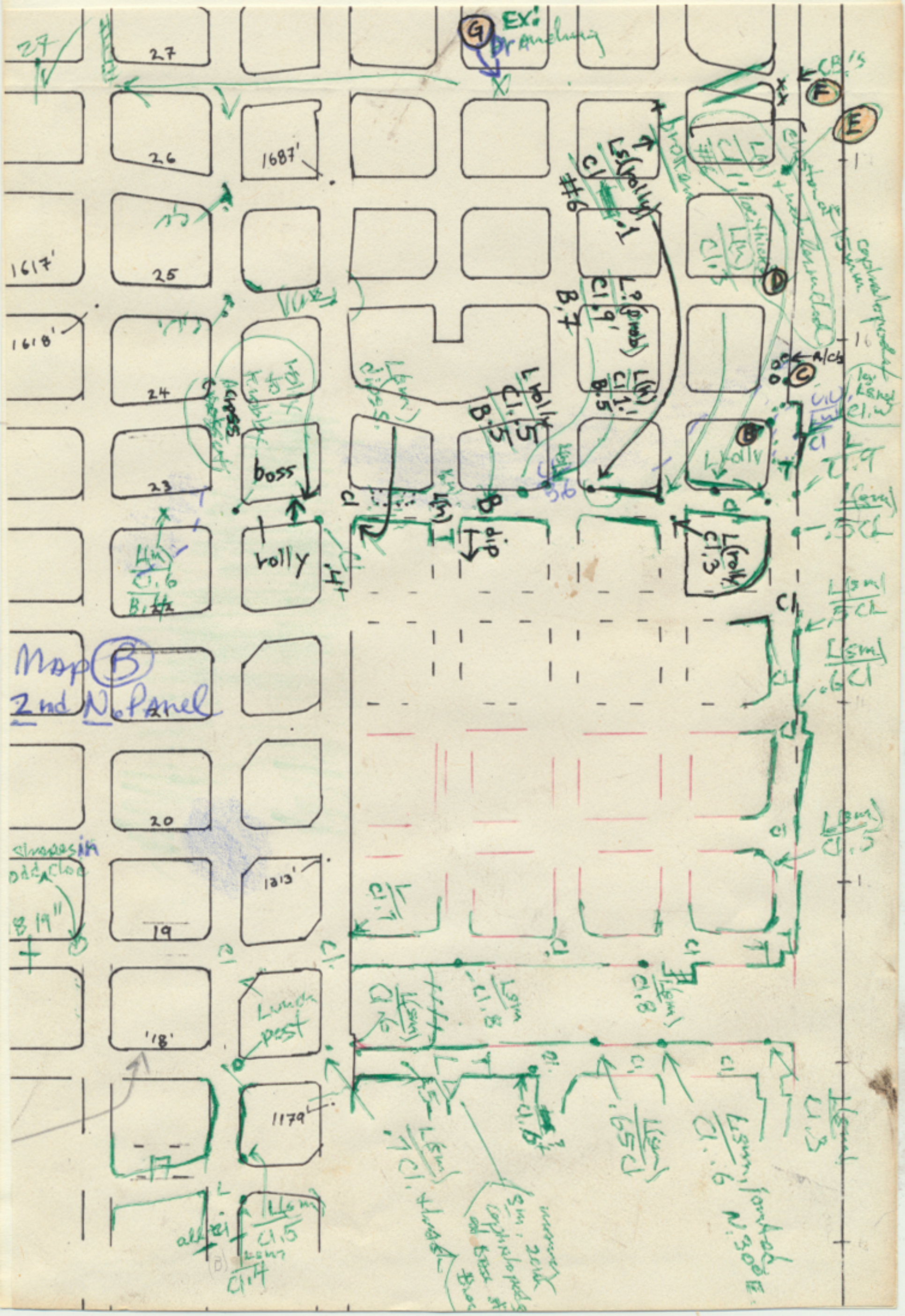
Within the siltstone unit (mapped as "Lawson") there was one large stem which was coalified with a pyritic coal ball where the vascular



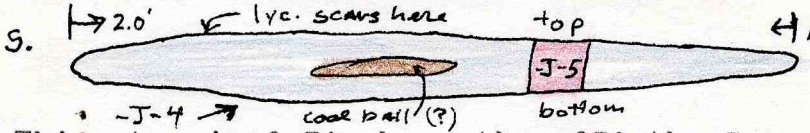
(2nd N. Panel)

Map A 9/19/79

MAP (B) 9/19/79

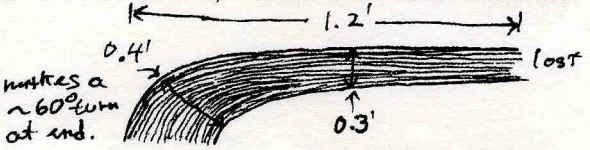

27
26
25
24
23
21
20
19
'18'
17
1687'
1617'
1618'
1313'
1179'
boss
rolly
Map (B)
2nd N. Panel
Lunch post

bundle lies. It was 1.8' wide (2.0' at an oblique angle) and both the coal and the coal ball were sampled. (-J- 4 & 5). Lepidodendron leaf scars were found on the top south side, but because another log was pressed against that area the identification is probable, but not certain. Sketch:



This stem is 0.3' above the .05' th. Ss. unit. The sediment here is rather barren of small leaves; has several 0.3-0.4' wide stems also & some fine carb. material & mica flakes.

Within the uppercoal at or very near the base are several recognizable pteridosperm petioles (confirmed w. T.L.P. that they were cordaites leaves, upon my description) several of which make a slight "turn" at their wide end. Most accessible (these were inplace in a roof fall) one was sketched:



Ribs/veins? (from memory) were about 10-14 per centimeter across the width.

Below the coal 0.5 to 0.7' a couple of Stigmaria (ficoides?) were noted in the sltst. Rootlets off the root were uniformly a foot or longer and one was measured at 42 cm; these were rootlets subparallel with bedding - others could not be measured.

C. Sltst. over remnants of fossilif. Anna:

Sltst. is 0.9' thick and has stems with branching & many fern-like pinna are present. (Hindsight says 'Sample them!')

D. This intersection has upper coal w. stig. below; check of earlier mapping shows this is a new fall.

E. Wet and hissing rib; evidence of Ss. on top coal? - good indicator of Ss. in the north mains, but no expos. here.

F. Top coal coal balls seen, but not easily sampled; one was a single log over 3' long; are thin and pyritic.

G. More branching seen on a 4' long stem; Would be good photo sight. I took rough sketch of branching to T.L.P. who said it was likely pteridosperm petiole again; the petiole itself is slightly ovate; the petiole ends at the joint of the primary pinna.

Samples Set "J" begun

CII-J-1	Site a; Lingula from the Anna.
CII-J-2	Site A; Brachiopod (Productid?) with prom. twin tooth/socket, from the Anna.
CII-J-3	Site A; Prob. Gastropod form Anna shale.
CII-J-4	Coalified & partly mineralized stem, prob. lycopod; Site B.
CII-J-5	Small portion of coalified portion of stem (see sketch); site B.

Will also run Sulfur on J-4.

FREEMAN UNITED COAL MINING COMPANY CROWN II MINE

October 23-24, 1979

Notes by John Nelson on visit with H.-F. Krausse and Howard Schwalb.

Strike-slip fault in 5th South Panel off Main East. See map (over)

1.) Well-marked open fractures in Anna Shale strike 065. They lie in en echelon pattern. Also observe striations on base of Anna Shale striking 045. Some fractures in shale may have slight displacement. Joints in coal strike 055-060 and 145 (upper part of seam) and 132-140 (middle part of seam). These joints do not coincide exactly with fractures in shale. Joints in coal are not quite vertical; they are spaced less than an inch apart. One "kink zone" in top coal trends NW-SE, following joints.

2.) Prominent zone of fractures in roof trending NW-SE. Shale is "kinking"along the fractures. Cannot observe an displacement, but locally slickensides are visible and shale is crushed. The fractures form a right-hand en echelon pattern, as shown on map. The individual fractures strike 132-138 but the overall trend of the system is about 148.

3.) Continuation of same fractures to the southeast; they are becoming more and more prominent. The shale is crushed and slickensided in the heart of the zone. The fractures dip about 45 degrees; mostly dip to NE but some dip to SW. At point 3A a vertical displacemen is visible in the coal; the NE side downthrown 0.18'. The coal is pulverized along the fracture. At one poin slickensides on a surface indicate left-lateral obliqu slippage (dip 70 degrees).

4.) Strike-slip fault is well marked. Overall trend is 097. On the west rib two sub-parallel faults are seen in the limestone, forming a horst above the coal.

The northerly fault is quite sharp and has 0.5' throw down to the north. The southerly fault appears to consist of s series of short, staggered fractures with right-hand offset (en echelon). The zone widens downward, and at the top of the coal is a graben with crushed Anna Shale in the downdropped block. Below this the coal is crushed and pulverized, and clay bands are squeezed or smeared inconsistently up or down. Several surfaces on the coal and shale have faint horizontal striations, with a possible overprint of even fainter dip-slip striations.

Easteward the two branches of the fault merge into a single break, with the north side downthrown, and a narrow downdropped zone of crushed shale and coal right along the fault plane.

5.) Strike-slip fault is a single break trending 105/90, and having the top of the coal downthrown 2.3 feet on the west rib. About four feet north of the fault is a small monoclinal fold in the coal. The axis of the fold trends 125/horizontal and the southwest side is folded down about 0.2-0.3 feet. The fold is crinkled (has smaller folds superimposed).

Along the main fault the Anna Shale is squeezed upward into the limestone. The limestone is brecciated along the fault, and has a nodular appaerance like underclay limestone-these are rounded, not angular clasts. Also seen in the limestone are mullion and slickensides indicating nearly horizontal movement. Since the mullion plunge gently westward, and the north side of the fault is downthrown, left-lateral slip is indicated.

North of the fault the coal, shale, and limestone are gently folded into a broad anticline about 40-50 feet wide. Close to the fault the layers dip southward. Possibly the fold is a result of faulting.

Isopach Map. On both sides of the fault the Anna Shale has been taken down to the base of the limestone