

Survey Book 1

W. I. Stanton

"Crabtrees"

STREET

Somerset

England

THEORY OF ERRORS.

Two sets of observers measured the angles of a triangulation. They obtained the following sets of mis-closures of fully observed Δ 's.

First set of observers

$$+3'' + 20'' - 15'' + 07'' - 10'' + 21'' - 03'' - 17''$$

Second set of observers.

$$-8'' + 12'' - 12'' - 13'' + 9'' + 15'' - 6'' + 11''$$

Find the probable error of the measurement of a single angle for each set of observers.

The formula giving the probable error of a series of measurements, where e_1, e_2, \dots, e_n is the error of each measurement is:—

$$e = 0.675 \sqrt{\frac{\sum (e^2)}{n}}$$

\therefore the Probable error of measuring a single angle, as the given errors are the closing errors of measuring 3 angles.

$$= 0.675 \sqrt{\frac{\sum e^2}{3n}}$$

$$\therefore \text{P.E. of first set of observers} = 0.675 \sqrt{\frac{9 + 400 + 225 + 49 + 100 + 9 + 441 + 289}{24}}$$

No	log
63.43	1.8023
$\div 2$.9012
0.675	9.8293
5.38	.7305

No	log
41	1.6128
$\div 2$.8064
0.675	9.8293
4.32	.6357

$$= 0.675 \sqrt{\frac{1522}{24}} = 0.675 \sqrt{63.43}$$

$$= 5.38 \checkmark$$

$$\therefore \underline{\underline{\text{Probable error of first set of observers} = 5.38''}}$$

$$\text{P.E. of second set of observers} = 0.675 \sqrt{\frac{64 + 144 + 144 + 169 + 81 + 225 + 36 + 121}{24}}$$

$$= 0.675 \sqrt{\frac{984}{24}} = 0.675 \sqrt{41}$$

$$\therefore \underline{\underline{\text{Probable error of second set of observers} = 4.32''}}$$

REQUIRED TO DETERMINE THE X-ANGLE OR DIRECTION OF AD,

STA	HORIZ. ANGLE	X-ANGLE α	HORIZ. DIST. S	$S \cos \alpha$	$S \sin \alpha$
A				2.61553 9.92506 <u>2.54059</u>	2.61553 9.73259 <u>2.34812</u>
B	16° 27' 00"	327° 18' 00"	412.60	2.28571 9.98229 <u>2.26740</u>	2.28511 9.44689 <u>1.73200</u>
C	270° 12' 00"	163° 45' 00"	192.80	2.49762 9.44166 <u>1.93928</u>	2.49762 9.98273 <u>2.48035</u>
D		253° 57' 00"	314.50		

286 39 00
327 18 00
613 57 00

2 x 180 = 360

CHECK. 253 57 00

$$\tan \gamma = \frac{\sum \Delta y}{\sum \Delta x}$$

$$\log \tan \gamma = \log (\sum \Delta y) - \log (\sum \Delta x)$$

$$AD = \sum \Delta x \sec \gamma$$

$$\text{Also } AD = \sum \Delta y \operatorname{cosec} \gamma$$

$$\log AD = \log (\sum \Delta x) + \log \sec \gamma$$

$$\log AD = \log (\sum \Delta y) + \log \operatorname{cosec} \gamma$$

The two formulae are :- $\tan \gamma = \frac{\sum \Delta y}{\sum \Delta x}$

$$AD = \sum \Delta x \sec \gamma \text{ or } \sum \Delta y \operatorname{cosec} \gamma$$

γ = the quadrantal angle AD makes with the X axis. In this example $\gamma = 80^\circ 56' 13''$, + is in the 4th Quadrant, + its measure as computed is counter-clockwise. It is usual to determine the clockwise measure of the direction of AD.

By the above two formulae :-

$$AD = 477.15$$

$$\text{Bearing AD} = 279^\circ 03' 47''$$

and $2A = y_A(x_B - x_F) + y_B(x_C - x_A) + \dots + y_F(x_A - x_E)$

First Computation. $x \times$			Second Computation. $y \times$		
diff of adjacent y 's No	Log.	Area	diff of adjacent x 's No	Log.	Area
136.46	2.13500		569.27	2.75332	
1163.04	3.06539		272.77	2.43580	
158,710	5.20059	158,710	155,280	5.19112	155,280
272.77	2.43580		1163.04	3.06539	
522.33	2.71794		1313.22	3.11834	
162,480	5.15374	162,480	1,527,320	6.18393	1,527,320
1449.68	3.16127		1091.60	3.03806	
679.85	2.83242		1135.95	3.05536	
985,580	5.99369	985,580	1,240,000	6.09342	1,240,000
1408.72	3.14852		483.19	2.68412	
1091.60	3.03806		689.59	2.68981	
1,537,730	6.18688	1,537,730	236,560	5.37393	236,560
960.11	2.98232				
483.19	2.68412				
463,930	5.66644	463,930			
		201,190			2,922,600
		2,987,260			236,560
		301,190			2,686,040
		2,686,050			check.
		Area. 1,343,020			Area 1,343,020
					TEAN AREA = 1,343,020

SURVEY OF RESERVOIR HOLE.

STA.	F.S.	Vert. Circle	Distance. Feet	Horiz Dist Feet	Vert. Dist. Feet.	
①	185° 20'					Floor of entrance. Alt 414.1
	185° 20'	-14° 12'	13.5	13.1	-3.3	1' below roof.
②						1' above floor.
	204° 30'	-11° 20'	6.0	5.9	-1.2	
③						On floor of first Squeeze
	192° -'	-20° -'	8.5	8.0	-2.9	
④						1' above floor
	207° 30'	-16° 20'	15.5	14.9	-4.3	
⑤						Alt 402.4'
						3' above floor. In 1 st barrier.
						6' from end (2 nd barrier.)

GOUGHS CAVE SURVEY cont. 2. January 2nd 1952

STATION	HR	DF	NL	NR	F.S.	B.S.	Bearing	Distance	Fore Cline	Horiz D	Vert. D		
A - A								70.8'	-3° 45'		-4.6		
A - B								55.7	-0 30		-0.5		
B - C								26.0	+4 35		+2.1		
C - D								34.0	+1 35		+0.9		
D - E							332° 35'	332° 35'	+8 40	38.4	+5.8		
E													
E - F							085 60	085 60	+5 50	96.8	+9.9		
F - G							224 15	044 15	+6 40	32.4	+3.8		
G - H							112 00	112 00	+6 60	40.6	+4.4		
H													
G - I							292 55	292 55	-0 05	93.5	-0.1		
I - J	2	3	9				088 40	268 40	-15 50	19.1	-5.4		
J - K	16	2(+)	4	4			238 15	238 15	-13 40	22.8	-5.6		
K - L	2	1	3	4			044 50	224 50	-3 40	14.8	-1.0		
L - E							159 30	159 30	+37 60	6.0	+4.5		
I - M								2.2	-90 00	—	-2.2		
M - N							150 55	330 55	+21 30	22.0	+8.7		
N - O							076 50	076 50	+21 30	7.4	+2.9		
O - P							167 30	347 30	+16 20	23.2	+6.8		
P	2	1.5	2	^{back} 7									
Q - R							282 00	102 30	282 15	62.2	-19 00	58.8	-20.2
R - S							343 30		343 30	42.5	-5 30	42.3	-4.1
S - T							123 00	303 00	179.6	+0 53	179.5	+2.7	
T - H							225 35		225 35	28.2	-8 30	27.9	-4.2
T - U							255 30		255 30	148.7	-8 00	147.1	-20.7
U - V							093 50	273 50	28.8	-3 30	28.7	-1.7	
V - W							259 00		259 00	60.4	-3 60	60.2	-3.3
W - X							126 15	306 15	90.7	+2 00	90.5	+3.2	
X - Y							287 15		287 15	74.2	+2 40	74.0	+3.4
Y - Z							359 00		359 00	48.8	+7 00	48.5	+5.9
Z													

January				3rd			
Q - R	282 00	102 30	282 15	62.2	-19 00	58.8	-20.2
R - S	343 30		343 30	42.5	-5 30	42.3	-4.1
S - T		123 00	303 00	179.6	+0 53	179.5	+2.7
T - H	225 35		225 35	28.2	-8 30	27.9	-4.2
T - U	255 30		255 30	148.7	-8 00	147.1	-20.7
U - V		093 50	273 50	28.8	-3 30	28.7	-1.7
V - W	259 00		259 00	60.4	-3 60	60.2	-3.3
W - X		126 15	306 15	90.7	+2 00	90.5	+3.2
X - Y	287 15		287 15	74.2	+2 40	74.0	+3.4
Y - Z	359 00		359 00	48.8	+7 00	48.5	+5.9

Readings magnetic, $11^{\circ}30'$ W. (calibrated)

Altitude

$$AX = 100 \cdot 4$$
$$A = 95.8$$
$$E = 95.3$$

$C = 97.4$

$$D = 98.3$$
$$E = 104.1$$
$$F = 108.2$$
$$G = 111.9$$
$$H = 116.3$$
$$I = 111.8$$
$$J = 106.3$$
$$K = 100.7$$
$$L = 99.7$$
$$E = 10.4 \text{ eV}$$
$$M = 109.6$$
$$N = 118.3$$
$$Q = 121.2$$

P = 128-0

AX is mid-centre bar of tails round Skeleton Pit (See p. 35-36, + alt. = 100.4)

B is 2'6" above lowest point on pathway. All lowest pt = 92.8

c is mid-centre bar of rails before pool on South. + alt = 97.4

It is in construction at N end of big aven on North.

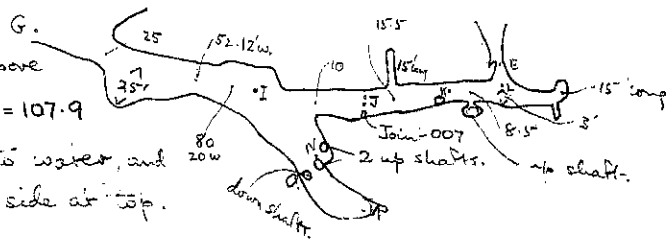
F is opposite passage on S which runs at 142° for $20'$, then at 104° for $15'$

H is at water-level on extreme Weir end of ~~Boke~~ Village. First concrete pier

{ J is 1.6' below snow arrow on roof, above
impassable rift, going down to water. \downarrow alt. = 107.9

{ K is 3' SW of a shaft going down to water, and
 { 0.2' below top of pimple on E. W. side at top.
 { Pimple 9 = alt 100.9

{ Pimple $\phi = \text{alt } 100.9$



Direction of up shaft (± 60 high) is 177°

O is 0.3' above rock tip at toe of overhanging the lower shaft. \uparrow alt = 120.9

P is 3' before top end of passage.

1952.

$Q = \text{Sta } 2$ on p. 14.

H is at water level on extreme West end of first concrete pool

V is in big area.

W is 2.6' above lowest pt. in pathway.

2 in corner of guides room at floor level. = Sta. C on p 14, #1

$$Z = 107.7$$

BOUGHS 2nd SURVEY

STA	HR	DF	WL	NR	I-S	BS	Bearing	Distance	Fore Cld	Horiz Dist	Vert Dist
(H) - AA						162° 15'	342° 15'	53.3'	+11° 50'	52.2	+11.0
(AA) - AB	5.5	2	15		060 10		060 10	28.9	+29 30	25.2	+14.2
(AB) - AC	1	0.5	2.5	2.5		217 00	037 00	12.8	+58 00	6.8	+10.9
(AC) - AD					310 00		310 00	19.2	-13 00	18.7	-4.3
(AD) - AE	±30	3	1 back 4	4	114 00		114 00	33.1	+8 35	32.8	+4.9
(AE)	10	5	2	-							
(AE)	0.5	0.5	0.5	3							
(H) - AF						242 10	062 10	24.0	+3 15	24.0	+1.4
(AF) - AG					109 40		109 40	37.9	+1 30	37.9	+1.0
(AG) - AH						262 00	082 00	72.4	+17 10	69.2	+21.4
(AH) - AI	6(12)	3	20(35)	5	115 20		115 20	50.8	+1 30	50.8	+1.3
(AI) - AJ					146 15		146 15	57.1	-21 05	53.2	-20.5
(AJ) - AK						086 35	266 35	36.8	-0 30	36.8	-0.2
(AK) - AG					298 40		298 40	70.5	0 00	70.5	---
(AG)											

January 10th 1952.

(T) - AE	2				110 10		110 10	35.2	-1 30	35.2	-0.9
(AE) - AB	1.5	1.5	6.0	1.5	257 20		077 20	21.5	-5 10	21.4	-1.9
(AB) - AN	1.5	2.5	4.0	5.0	109 35		109 35	15.7	-7 00	15.6	-1.9
(AN) - AO	1	3	3.0	7.0	081 25		261 25	16.2	-49 30	10.5	-12.3
(AO) - AP	2	4	8.0	3.0	336 40		336 40	32.6	-46 30	22.4	-23.7
(AP) - AQ	2	4	4.0	2.0	129 50		309 50	12.5	+35 30	10.2	+7.3
(AQ) - AC	3(30)	2	15.0	3.0	308 30		308 30	20.3	+1 30	20.3	+0.5
(AC)		10									

January 11th 1952.

(AC) - AR	1.0				237 30		057 30	21.1	+5 30	21.0	+2.0
(AR) - AS	2.0	10.4	4	11	098 30		098 30	19.2	+4 30	19.1	+1.5
(AS) - AT	2.0	0.9	6	4	267 30		087 30	26.3	+38 30	20.6	+16.4
(AT) - AV	±30.0	2.9 rocks	5	2	317 30		317 30	26.7	+55 00	15.3	+21.9
(AV) - AW	±25.0	1.5	1	3	147 10		327 10	14.2	-20 00	13.3	-4.9
(AW) - AX	1.0(200)	1.6	1	3	311 30		311 30	29.1	+8 15	28.8	+4.2
(AX)	15.0	6	-	7	351 00		351 00	17.9	-3 Back	17.7	-3.0
(AX)	3.0	6	1	-							

February 1st 1952.

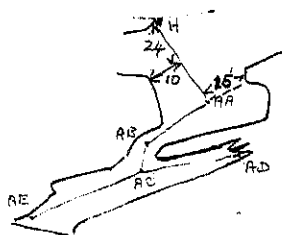
(AY)					202 30		022 30	15.3	-11 20	15.0	-3.0
(AV) - AZ	10	2.5	5(15)	25	305 20		305 20	25.3	+5 30	25.1	+2.4
(AZ) - BA	±45	-	-	18	305 20 188 40		305 20 008 40	21.2	+19 00	20.0	+6.9
(BA) - BB	±40	2.5	1		018 00		018 00	15.7	-25 30	14.2	-6.8
(BB) - BC	cemented 4 rocks	-	25	gate 6	018 00 288 00		108 00	7.7	-1 30	7.7	-0.2
(BC) - BD	2.5	3	4	4	121 10		121 10	11.4	-37 00	9.1	-6.9
(BD) - BE	3(6)	2	10	3	295 30		115 30	17.5	-20 10	16.4	-6.0
(BE) - BF	2.5	1.5	15	5	172 30		172 30	14.6	-18 30	13.8	-4.6
(BF) - BG					125 30		125 30	17.0	-5 30	16.9	-1.6
(BG) - BH	8	on rock						6.9	-90 00	-	-6.9
(BH) - BI					161 30		341 30	16.9	-13 00	16.5	-3.8
(BI) - BJ					121 30		121 30	49.0	+2 00	48.9	+1.7
(BJ) - BK	1		10	1	299 40		299 40	57.8	± 161 11'	57.7	± 0.8

January 5th 1952.

Notes.

Altitude.

H = 116.3
 AA = 127.8
 AB = 141.5
 AC = 152.4
 AD = 148.1
 AE = 157.3



H = 116.3

AF = 117.7

AG = 118.7

AH = 139.9

AH is 2' over top of rock, below

AI = 141.2

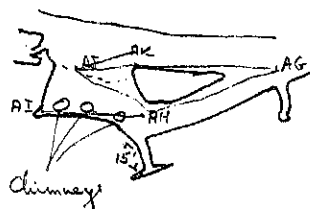
smoke arrow

AJ = 119.2

AK = 118.9

AK is 1' over jutting bit of rock on corner, below smoke arrow dot @

AG = 118.7



T' = 170.4

T' is 1' above T' of page 15, below smoke mark. Passage starts at 18'

AL = 169.5

AM = 167.7

AM over connecting hole

AN = 165.8

AN at head of subsidiary 40' drop on far side

AO = 153.6

AO where we enters loop.

AP = 130.0

AP 5' above where water issues during floods. below smoke mark

AQ = 137.4

AC = 137.9

AC = AC of page 15.

AC = 137.9

AC = AC of page 15 Passage starts at 19'

AR = 139.9

AS = 141.4

AS is at end of low passage.

AT = 157.8

AT is on N. side of a very high aven.

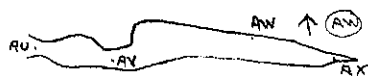
AU = 179.7

AV = 174.8

AW = 179.0

AX = 176.0

AX is 2' from end.



J = 144.5

AY = 141.5

AZ = 143.9

BA = 150.8

BB = 144.0

BC = 143.8

BD = 136.9

BE = 130.9

BF = 126.3

BG = 129.3

BH = 122.4

BI = 118.6

BJ = 120.3

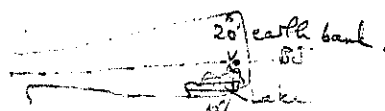
Compass
 Readings unreliable as much iron about.

At 8' the negotiable passage is 2' to the right of line.

Stream enters at point 6' to right of BF, & 2' lower. ~~Stream~~ is 124.3' alt.

BT is at end of long low wide bedding plane

Temporary lake at 30' - 45'



STA	HR	DF	WL	WR	FS	BS	Bearing	Distance	Fore Clino	H. Dist	V. Dist
(BK)-BL	1	0.5	6	5		121° 56'	30° 50'	15.9	+9 inches	15.8	+0.8'
(BL)-BM	0.5	1.5		2.5	244 30		244 30	9.8	+11° 00'		+1.9
(BM)-BN	5	1	5	3		106° 40'	286 40	27.1	-8 15		-3.9
Feb 2nd 1952											
(BN)-BO	1.5	2	2	6	259 30		259 30	10.9	-10 30	10.7	-2.0
(BO)-AK	2	-				093 30	273 30	46.8	+2 30	46.5	+2.1
(BP)-BQ	6	2	5	5	179 10		179 10	45.0	+38 30	35.2	+28.0
(BQ)-BR	20	-	9	15		330 00	150 00	68.0	+55 30	38.5	+56.0
(BR)	±10	1	Forward	3	4						
Feb 3rd 1952											

goes on 25' beyond, to pile of earth.

Check levelling (J) -- (AK)

(J) - ①								23.9	-15 50		-6.5
① - 2								40.0	-30 00		-20.0
② - 3								46.6	-3 30		-2.8
③ - AK								46.7	+1 50		+2.1
(AK)											
(BS)-BT								19.4	-15 50	18.7	-5.6
(BT)-BU								8.8	-4 00	8.8	-0.6
(BU)											

Check Great Jones traverse. Feb 4th 1952.

(AT) - i						285 30	105 30	43.5	-4 30	43.3	-3.4
① - ii	4	2	6	12	115 30		115 30	122.7	+2 30	122.2	+5.4
② - iii						325 20	145 20	15.8	-6 30	15.6	-1.8
③ - iv	2	4	10	6	101 50		101 50	32.8	+7 40	32.5	+4.4
④ - v						348 30	168 30	39.8	-34 20	32.8	-22.4
⑤ - vi	5	2	10	12	208 00		208 00	39.8	-31 30	33.9	-20.8
⑥ - vii						021 00	201 00	10.7	-31 30	9.1	-5.6
⑦ - viii						197 10	197 10	36.7	-20 30	34.4	-12.8
⑧ - ix	2	2				010 00	190 00	12.6	-58 30	6.6	-10.7
⑨ - x	2	0.5				151 50	151 50	34.9	-21 00	32.5	-12.5
⑩ - xi	3	0.5	Forward			286 30	106 30	21.8	-1 30	21.7	-0.6
⑪ - x'	2	2	5	6							

Check show-cave traverse, March 3rd 1952. Compass readings taken with

- ① - 2
- ② - 3
- ③ - 4
- ④ - 5
- ⑤ - 6
- ⑥ - 7
- ⑦ - 8
- ⑧ - 9
- ⑨ - 10
- ⑩ - 11
- ⑪ - 12
- ⑫ - 13
- ⑬ - 14
- ⑭ - 15
- ⑮ - 16
- ⑯ - 17
- ⑰ - 18
- ⑱ - 19
- ⑲ - 20
- ⑳ - 21
- ㉑ - 22
- ㉒ - 23
- ㉓ - 24
- ㉔ - 25
- ㉕ - 26
- ㉖ - 27
- ㉗ - 28
- ㉘ - 29
- ㉙ - 30
- ㉚ - 31
- ㉛ - 32
- ㉜ - 33
- ㉝ - 34
- ㉞ - 35
- ㉟ - 36
- ㊱ - 37
- ㊲ - 38
- ㊳ - 39
- ㊴ - 40
- ㊵ - 41
- ㊶ - 42
- ㊷ - 43
- ㊸ - 44
- ㊹ - 45
- ㊺ - 46
- ㊻ - 47
- ㊼ - 48
- ㊽ - 49
- ㊾ - 50
- ㊿ - 51

See page 57 - 58.

⑤ - 6	① - 2					249 30	065 30	26.6	+3 00	26.4	+1.8
⑥ - 7	② - 3	2	2	3	5	065 00		065 40	+12 00	25.9	+6.2
⑦ - 8	③ - 4	6	1	5		299 00	142 50	21.8	+5 00	21.5	+1.8

Oct. 10th 1963

Muddy bedding

012 60	012 60	44.6	+16.30	42.8	+12.7
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Readings Magnetic, var. 1.30 W.

Notes:

Altitude.

BK = 117.6
 BL = 118.4
 BM = 120.3
 BN = 116.4
 BO = 114.4
 BK' = 116.5 AK' is 0.7' below Sta AK of Page 1.

Passage, v. tight & muddy, goes straight on & rejoins lower after 15'.

BP = 95.5
 BQ = 123.5
 BR = 179.5
 Scallop at BQ are small & numerous, with indefinite upward tendencies. Dip 12° S at H's to Font. Passage goes off other side even 25' to North - 12' higher i.e. 191.5'. Font = 98' high.



J = 144.5 J is Sta J of p 14
 ① = 138.0
 ② = 118.0
 ③ = 115.2
 AK = 117.3 AK is Sta AK above.

BS = 100.4 BS is mid-centre bar of rails round Skeleton Pit - AX = 100.4 of p. 2.
 BT = 94.8 F.S. BS - BU = 016°
 BU = 94.2 BU marked by O. Today it was 8.9' above water level. = 85.3' alt.

AT = 304.9 = AT on p. 34

i = 301.5

ii = 306.9

iii = 305.1

Passage to South at 20'

iv = 309.5

Same passage comes in at 14'.

v = 287.1

vi = 266.3

vii = 260.7

viii = 247.9

On top of rock at entrance to first squeeze (3' this side) below smoke mark

ix = 237.2

x = 224.7

goes on 8' in same line until choked by stalagmite boss.

xi = 224.1

all show same right off.

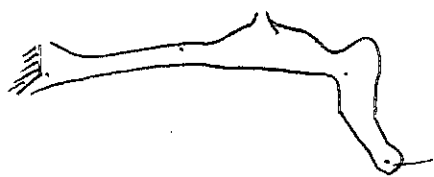
12.7

114.0

120.2

122.1

① is corner of guide room, 5' above floor



"SAND HOLE"

plane.

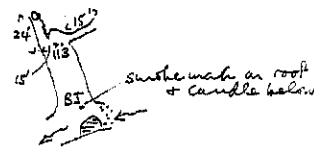
Mag var. 8.30 W.

120.3

133.0

BT = BT of p. 3

Marked by candle standing below smoke mark.

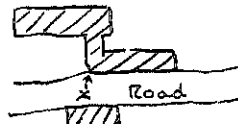
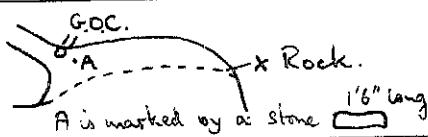

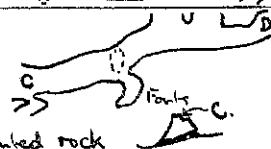
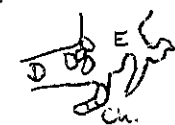
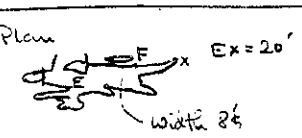




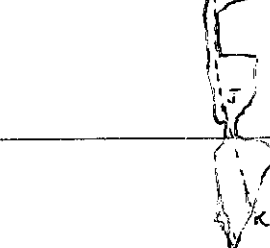

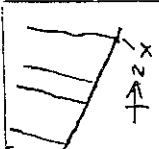

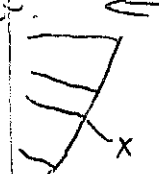


All bearings magnetic, variation ~~20~~²⁰ W.
11 30

LONG HOLE SURVEY.

STATION	Ht. Roof	Dp. Floor	Width L. [Facing	Width R. Outwards]	Foresight	Backsight	Bearing
(A) to building	5	1.5	5	10	313°	—	313°
(A) to rock	—	—	—	—	270°	—	270°
(A) to B	—	—	—	—	71°30'	252°30'	72°
(B) to C	6.5	1.5	3	12	91°30'	273°	92°15'
(C) to D	3 8 in area	2	8	6	85°	266°	85°30'
(D) to E	3 8 in area	1	4	4	75°30'	257°	76°15'
(E) to F	±30	1½	4 to little passage	5	275°	—	275°
(F) to G	12	1	2	3	—	146°30'	326°30'
(G) to H	6	2	8	2	337°30'	157°30'	337°30'
(H) to I	8	2	—	—	92°30'	±275°	93°
(I) to J	9	2	1	9	60°	241°	60°30'
(J) to K	10	2	2	10	52°	—	52°
(A) to wall.	5	1'10"	—	—	321°30'	—	321°30'
(A) to Lion Rock	5	1'10"	—	—	341°30'	—	341°30'
A.B. THIS	READING	IS	NOT	RELIABLE, AS			LION ROCK
(A) to wall	5	1'10"	—	—	321°		321°

W. I. Stanton. Jan 2nd 1950 ~ March 26th 1950

Distance.	Vert. \angle	Horiz Distance	NOTES.
± 400	-20°	± 375 [137' Vertical Dist.]	Reading taken onto corner of house at road level opposite Mr. Bayes. at X. 
± 80	-12°	± 78	Rock is on the ground just under the overhang at the other end of the archway. 
83'6"	$+14^\circ 30'$	80.83	Long passage, a few averse, controlled by a vert. joint running down the middle. Constant width of about 12-15 feet.
78	$+7^\circ$	77.43	Aven 15' at 9' Side passage at C. Aven 20' at 43' Aven 8' at 64' 
82'3"	$+12^\circ 30'$	80.32	Aven 8' at 70 Height C is on top of a big pointed rock 
19'8"	$+33^\circ 30'$	16.41	Boulder jam starts at 12'. 
20	$+76^\circ$	4.84	Plan  Sec  Sec 
34'4"	$+32^\circ$	29.12	F is on boulder over drop. 
13'8"	$+8^\circ$	13.54	In small chamber. Plan 
14	-3°	13.98	H is in middle of chamber
31'7"	-13°	30.77	Narrows to 2' wide 15' high at 12' 
35	$\pm 4^\circ$	34.91	Narrows to 2' wide 1'6" high at 2' 
—	$-1^\circ 30'$	—	X is junction of walls on other side of gorge. 
18	$+2^\circ 45'$	—	End of Lion Rock is marked on 6" OS map. 
—	$-4^\circ 15'$	—	AS. above. 

LONG

HOLE

Station	Ht Roof	Depth Floor	Width L. (Facing Forward)	Width R.	Foresight	Backsight	Bearing
(A) to wall	5'	1'10"	—	—	322°	—	322°
(A) to wall	5'	1'10"	—	—	354°	—	354°
(C) to O	—	—	—	—	—	261°	81°
(O) to P	2'	1'	—	—	22°30'	—	22°30'
(C) to Q	—	—	—	—	142°	321°30'	141°45'
(Q) to R	1'6"	1'6"	3'6"	3'	210°30'	30°	210°15'
(R) to S	2'	9"	2'6"	2'6"	185°	5°	185°
(S) to T	1'6"	1'	2'	1'6"	151°30'	331°	151°15'
(T) to U	6"	2'	3'	3'	± 159°	336°	156°
(U)	4'	6"	4'	2'			
(A) to AA		2'			146°	—	146°
(AA) to BB		0'			162°	± 338°	162°
(BB) to CC	3'	1'	± 60'	2'	33°	—	38°
(CC) to DD	5'	3'	1'	4'6"	157° 157°	—	157°

GOUCHES

OLD

SURVEY, cont.

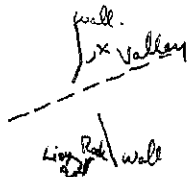
Vert. Dist. Distance Vertical \angle Horiz. Dist.

NOTES



Wall junction on other side of gorge.

X is kink in wall on other side of Bake Hole Valley.

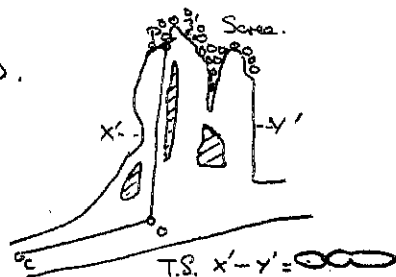


41' 11" -13° 15' 40.78

O is point between C & D.

46' 2" -35° 30' 37.53

P is at top of passage. 1' above floor, on scree

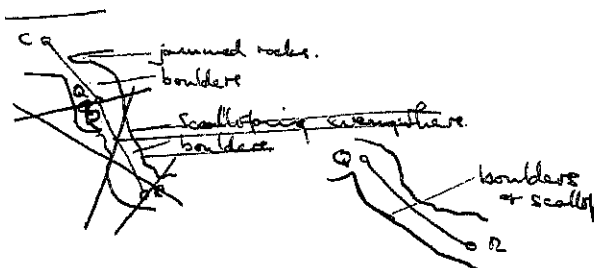


23' 2" -18° 21.97

Q is on a rock.

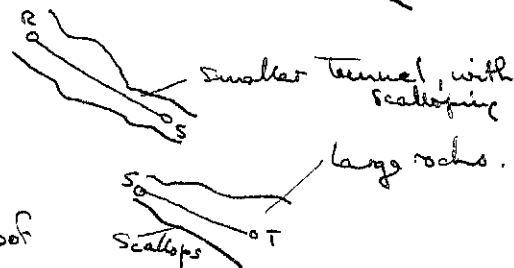
15' 7" -25° 30' 14.17

R is on a rock



21' 8" -15° 21.06

S is on a rock

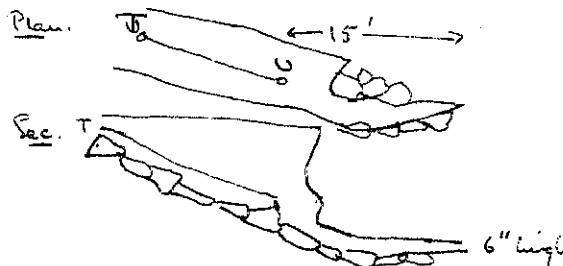


15' 9" +7° 15.69

T is on a boulder near roof

11' 7" -30° 60.14

U is on a rock (boulder floor.)



Altitude $\pm 208'$

CAVE SURVEY. [Long Hole cont.]

7' 6" -11° 7.36

AA is on earth floor, edge of trench

17' 2" -43° 12.58

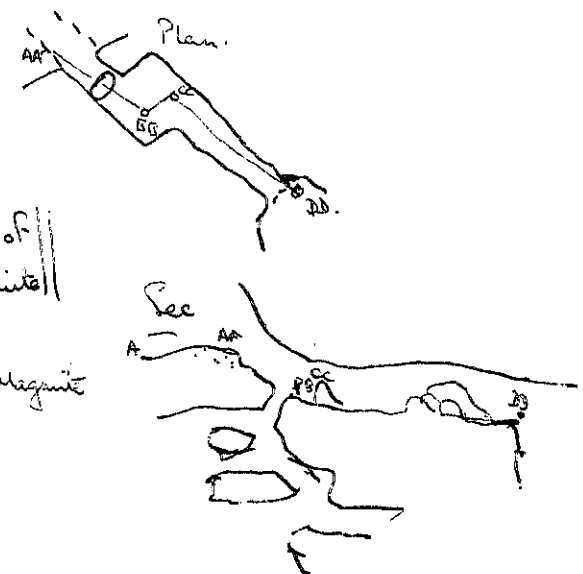
BB on a rock.

3' 1" +36' 2.57

CC is 4" above tip of large black stalagmite

18' -25° 16.31

DD is on sooty stalagmite



noiesome

GOUGH'S OLD CAVE

STATION Ht. Roof, Dph. Door, Width 1, Width 2, Foresight, Backsight, Bearing.
[Facing Forward]

CC to EE	5'	2'	4'6"	1'	322°	—	322°
EE to FF	1'6"	—	4'	±4'	34°	—	34°
DD to II	4'	0'	1'	3'	—	2.5°	182.5°
II to HH	6'	1'6"	6'6"	10'	9°	188°	8°30'
HH to GG	?40'	1'6"	8'	3'	336°	15.5°	335°30'
GG to FF	2'6"	1'6"	1'	2'6"	348.5°	—	348.5°
FF to ZZ	?30'	4'	3'	1'	Much iron about. 345.5°	160°	342.5° 347.5°
FF to YY	—	—	—	—	—	—	—
ZZ to XX	?30'	2'6"	5'	4'	←	87°	267°

Feb 4th 1952.

II - a	10	1.5				014 20 204 30	194 20 285 30
a - b	5	2	4	1	179 00		179 00
b - c	7	—	4	3		354 40	174 40
c backward	20	2	3	3	goes on 10'		

bearings measured 1850-1900

SURVEY CONTINUED.

Distance, Vert. & Horiz. Dist.,

NOTES.

13'2" -7°
~~13'2"~~
 32' -68°

13.1'
 less accurate
 than 205
 FF. 12.0'



47'2" -11° 46.3'

Vert. Depth of drop from DD = 26'.

45'2" -18°30' 42.8'

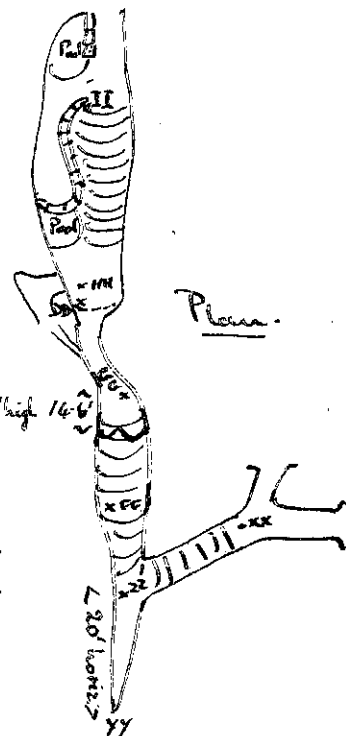
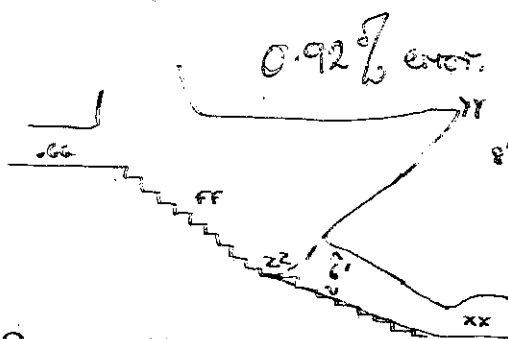
Wall ends at 20'.
 Steps & pool end at 26'.

14' -3° 14.0'

Sec.

26'2" +1°30' 26.2'

19'2" -40° 14.6'



Plan.

~~26'2"~~ +22° —

Roots at YY.

30'7" -31° 26.2'

Distance	F. Clino.	Hor. Dist.	Vert. Dist.	Alt.
20.8	-3 30	20.6	-1.0	19.6
22.8	-1 50	22.5	-0.5	22.0
24.2	+41 30	24.0	+1.0	25.0

Notes.

Chamber in road at 12'.

Total Error = 34'

GOUGH'S CAVE SURVEY

STA	E.S.	B.S.	Bearing	Distance	Climometer
A - B	7°30'	—	7°30' 12 3'	118.5'	-2°30'
A - C	122°	---	122°	34'6"	-5°30'
A - D	19°30'	—	19°30'	23'	-4°
D - E	275°	92°45'	273°55'	278'	-5°15'

	Width L	Width R	Ht. RF	Dire Floor	FS		
A ₁ - C ₁						51.0	+7°30'
A ₁ - B ₁						79.5	-4°15'
C ₁ - B ₁						75.0	0°00'
C ₁ - D ₁						50.0	+0°45'
E ₁ - D ₁						135.5	-7°15'
E ₁ - F						72.6	+5°50'
G - F						131.0	+0°30'
G - H						70°	+1°15'
I - H						37.5	-31°30'
I - J						23.5	+60°
K - J					344°40'	26.0	-41°30'
K - K ₁						36.0	+14°15'
K - L	7	15	15	3	124°20'	33.5	+20°15'
L - M					036°	68.5	+15°45'
N - L	20	20	chimney 30	2	311°30	28.5	+60°
N - O					172°30	32.0	+14°
N - P					116°30	44.0	+4°15'
P - Q			10	2	358°	54.5	+6°

Readings magnetic, $14^{\circ}30' W.$

21st Dec 1950. In conjunction with survey of B. Hayes, 1935.
 Horiz Dist, Vert. Dist, Altitude, Notes.

118.4'	-5.15'	B = 105.8'	A is on top of Gough's steps. Big corner of house 120' NNE of Gough's, at road level.
34.4'	-3.3'	C = 107.7'	C is corner of guinea man across the cave, at floor level.
23'	-1.6'	A = 111' 108.4	
276.7	-25.4'	D = 109.4'	E is Spet Height 84.

+6.6	A ₁ = 101.1	A ₁ is 2' above floor, + 3' above edge of skeleton pit.
-5.9	B ₁ = 95.2	B ₁ is floor.
—	C ₁ = 95.2	C ₁ is 2' above lowest point of cave.
+0.7	D ₁ = 95.9	D ₁ is floor. 4'6" above water level in ditch. 7' below ridge into Oxbow.
-17.1	E ₁ = 113.0	E ₁ is on same level as lower bed of rock hanging above the Oxbow. Heartbreak Hill starts at 65'.
+7.4	F = 120.4	F is 3' above path. Top of H. Hill at 29'.
+1.1	G = 119.3	G is 2' above path.
+1.5	H = 120.8	H' at foot of steps.
-19.6	I = 140.4	I is 2' above top of steps.

19.5	-17.2	K = 161.7
------	-------	-----------

34.9	+8.9	K ₁ = 170.6
------	------	------------------------

31.4	+11.6	L = 173.3
------	-------	-----------

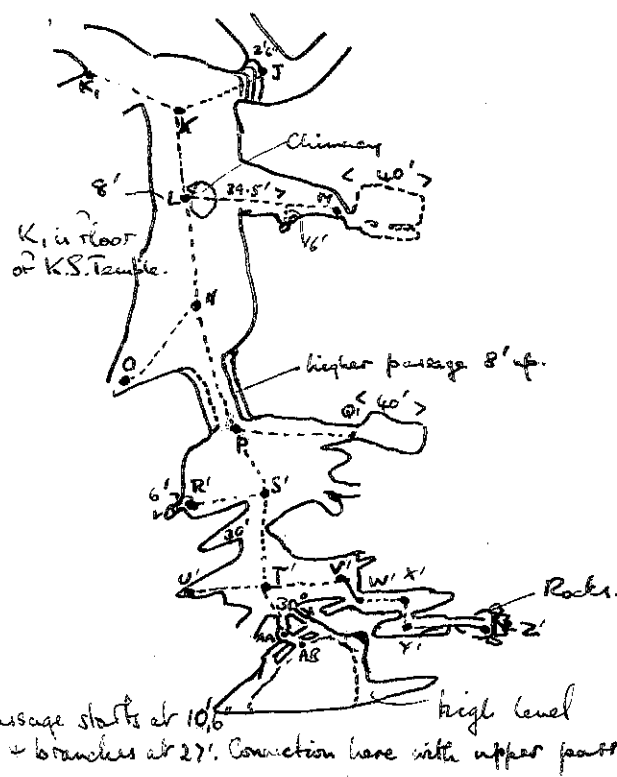
66.0	+18.6	M = 191.9
------	-------	-----------

28.0	+4.9	N = 168.4
------	------	-----------

31.0	+7.7	—
------	------	---

44.0	+3.3	P = 171.7
------	------	-----------

54.2	+5.7	—
------	------	---



STA	W.L.	W.R.	H.R.	DF.	F.S.	Vert Circle	DIST.
S' - P					²⁵⁹ 258 °	+ 2°	31.0
S' - R'	3'	-	(in a ^{340°} Pituit) 30'	1	185°	+ 6°	40.0
S' - T'					088°50'	- 1°45'	38.0
T' - U'					158°	—	34.0
T' - V'	15'	60'	10'	1	338°	+ 9° AAA	36.0
W' - V'	2	2	2	1	213°30'	+ 13°	17.5
X' - W'		3	20'	1.5	^{170°} 258 °	- 11° 0°00'	^{17.0} 38.0
X' - Y'					080°	- 7°	11.5
Y' - Z'	3	3	20	1	350°	0°00	35.0
T' - AA					054°40'	- 16°30'	23.0
AA - AB	3	3	2	2	024°30'	0°00'	11.0
AB - AC						- 90°	26.0
AC - AD	4	20	35		010°30'	+ 21°	27.0
AC - AE					228°20'	- 36°	20.5
AF - AE	20	60	8	2	125°20'	- 3°30'	18.0
AF - AG					290°	- 14°15'	18.5

SAYES HOLE SURVEY

January 13th 1952.

STA	HR	DF	WL	WR	FS	BS	Bearing	Distance	Fore Sino.	H. Dist.	V. Dist.
Ⓕ - G	20'	3.5'	7'	3'		326°50'	146 50	40.0	0°00'	40.0	—
Ⓖ - H	2	1.5	1	1	153 55		153 55	7.8	-31 30	6.7	-4.1
Ⓗ - I	4	1.5				253 45	073 45	12.1	-28 00	10.7	-5.7
Ⓘ - J	15	2.5	2	2	008 30		008 30		0 00		—
Ⓙ →	≈20	—	2	2							

Sum = 25'

NOTES

39.4 2 1/2 .9 —

Passage 2'6" high starts at 3', ends at 26'.

340

Readings: 1' up

W in a square.

WX // to high rift.

A hand-drawn diagram of a ship's hull cross-section. The diagram shows the hull shape with various points labeled. At the top, 'A 12' V' is written. Below it, '2' lower' is written. Further down, 'AG' is labeled. To the right of the hull, 'Low level.' is written. Below 'AG', '20'' is written. Further down, 'AC' is labeled. To the right of the hull, '20' up' is written. At the bottom left, '10'' is written. The diagram also shows a dashed line representing the waterline and a solid line representing the hull shape.

350

Reading 1 up.

11-3

AB is 2' out over edge of loop. In space.

AC is marked above 3 small stones on large rock.
1' above

$$25.2 + 9.7 =$$

16.6 -12.0 AE = 12.59

18.0 - 1.1 AF = 127.0

18.0 -4.1 AG = $\frac{122.9}{118.9}$ End of passage is $\frac{121}{118}$ altitude.

Readings magnetic, $11^{\circ} 30' W.$
Notes.

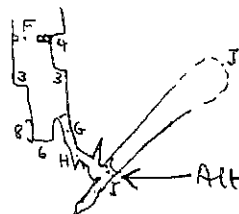
Altitude

F = 99.8 F is Station AT on p.36.

$$G = 99.8$$
$$H = 95.7$$
$$\dot{I} = 90.0$$
$$T = 90.0$$

I is mid way between two \uparrow smoke

It is at far end of lake.



Today the lake level in Sages was 3.0' below I, & the rising level was 4.0' below Ivy Cottage Bt.

- Alt BM = 90.0' ie. level Ring I = 86.3'
 II = 87.0

~ Sayes = 87.0

CHECK CLOSED TRAVERSE,

Sta	Dist	Lat	Long	F.S.	B.S.	Bearing
Fixed Point to 1.	51' 9"	+10° 20'	30.91	353°	178° 20'	353° 15'
① to 2.	31'	+19° 35'	29.22	350° 30'	171°	355° 45'
② to 3.	20'	+16° 30'	19.17	235° 30'	55° 5'	235° 20'
③ to 4.	19' 9"	-13° 20'	19.21	192° 30'	31° 20'	192°
④ to 5.	35' 10"	+24° 30'	32.53	353° 359°	155° 15'	339° 30'
⑤ to 6.	36' 4"	+19° 30'	36.25	294° 10' 294°	116°	295°
⑥ to F.P.		-21°	—	153°	—	—
⑦ to 7.	54'	-12° 30'	52.72	201° 20'	20° 20'	201°
⑧ to 8.	63' 4"	-18°	60.23	113°	292°	113°
⑨ to F.P.	41' 5"	-24° 40'	37.66	115° 30'	154° 15'	115°

Vert. Dist. Trans. 310:15, from 6th 1950.
Vert. Height.
0

+ 9.28
9.28

+ 60.35
19.63

+ 5.68
25.31

- 4.61
20.70

+ 14.85
35.55

+ 12.13
47.68

- 11.69
~~34.99~~
35.99

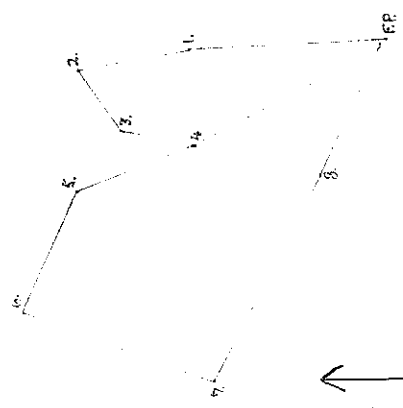
- 19.57
16.42

- 17.30
0.88

∴ Vertical error is 0.88' in 355' traverse

∴ Vert. error = 0.25%

PLAN



Scale 1" = 50'

Figure North,
Var. 10° 4' West,
April 1950.

∴ Map error is 2' in 355'
∴ Map error is 0.65%

CHE D A R

CORGE

STA.	BS.	LEFT CIRCLE			RIGHT CIRCLE			VERTICAL CIRCLE		DISTANCE in Feet.
		FS.	Pd. &		BS.	FS.	Pd. &	+	-	
A								5°30'		281.3
B	0° -	201°45'	201°45'	180°30'	022°30'	202° -	201°50'	3°45'		309.5
C	0° -	128°30'	128°30'	180°30'	308°00'	127°30'	127°00'		7°00'	15.7
D										
A								6°30'		157.8
B	0°00'	066°00'	066°00'	180°30'	246°10'	065°40'	065°50'	16°45'		134.5
C	0°00'	193°00'	193°00'	180°30'	012°30'	192°00'	192°30'	9°30'		14.8
D										
A								6°30'		183.0
B	0°00'	120°15'	120°15'	180°45'	299°45'	119°00'	119°40'	34°00'		138.0
C	180°00'	326°30'	146°30'	359°30'	147°00'	147°30'	147°00'	6°30'		40.7

SURVEY.

TRUE
BEARING
X-Angle

DISTANCE
Horiz. Vert.

217° 40' 280.0 + 26.9

195° 50' 308.9 + 20.2

248° 50' 15.6 - 1.9

212° 40' 156.8 + 17.9

326° 20' 128.8 + 38.8

313° 50' 14.6 + 2.45

283° 30' 181.9 + 20.72

343° 50' 114.4 + 77.18

16° 50' 40.43 + 4.61

2nd July 1950.

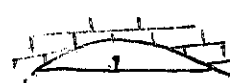
NOTES

A = B.M. 550.93

Prismatic bearing = 228.0° (Mag. Var. 10° 20' W.)

Prismatic B.S. = 48° 45'.

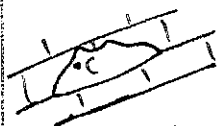
D is in middle of entrance to hole.

 3' wide, 1' high. goes in 4'.

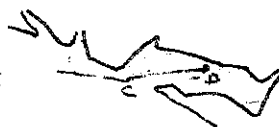
B.M. 550.93.

Prismatic bearing 222° 30'

Prismatic B.S. 42° 00'



Entrance 5' wide 2' 6" high, several other solution holes in same bedding plane.



length about 24'.

height < 2'.

width 3' - 6'. solutional

A = B.M. 502.6

Prismatic F.S. = 296° 00'

Prismatic B.S. 114°.

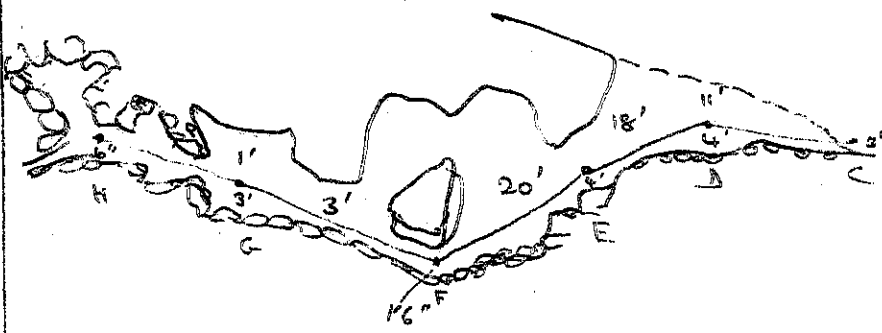
C is at entrance of Bone Hole ravine.

TRUE SURVEY

Bearing X - angle	Distance Horiz Vertical	
00° 30'	20.92	- 6.8
352° 30'	31.61	- 16.81
12° 40'	21.72	+ 11.54
357° 40'	13.18	+ 6.28

(CONT.)

Notes
Section



Plan



Passage choked 10' beyond H.

Station	Dist.	Vert \angle	Hor. Dist.	I. S.	B. S.	Bearing
(A) - B	680 742	+2° —	679 740.5	264°45'	84°45'	264°45'
(B) - C	485'9"	-1°20'	485'	269°45'	88°30'	269° —
(C) - D	21'6"	-33°	18.3' 18.0	175°30'	356°	175°45'
(D)						
(C) - E	55'3" 58.0	-5°	57.9 53.0	38°30'	218°15'	38°20'
(E) - F	49'7"	+8°50'	49.0 49.0	27°30'	208°15'	27°50'
(F) - G	57'4"	+1°15'	57.2' 57.4	25°	205°	25°
(G) - H	165'9"	+1°45'	165.2' 165.2	34°50'	214°50'	34°50'
(H) - I	132' 2"	—	132.2' 132.2	276°30'	96°30'	276°30'
(I) - C.				189°		189°

compass
All readings are magnetic, Variation

Vert dist.

Notes.

~~123.8~~

+25.9.

A is 2' 7" vertically above B.M. Vert dist +23.3'

B.M. 757.5

783.4

~~11.2~~

-11.3

B is in the field. Bearing B to top of shaft is 267°—
Vert dist -11.3'

772.1

~~11.7~~

-11.7.

C is top of N. corner post of N. depression
Vert dist 11.7'

Alt. of C = 772.1' + 0.0 = 772.1'

760.4

D is top of 4th barrel vertically after bung on N.E. side

Alt D = 761.1' + 0.0 = 762.0

-4.8'

-4.8.

E is 3' 4" above bottom of depression 7' deep, diam 39'.

Alt floor of depression = 764.6'

+7.6'

+7.6.

Intermediate point.

+1.25'

+1.2.

G is 3' 2" above bottom of shallow depression, 24' diam.

Alt floor of depression 773.5'

+5.1'

+5.1

H is 3' 4" above bottom of shallow depression 18' diam.

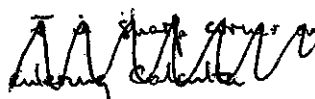
Alt floor of def = 778.6'

I is corner of wall, 4' above ground.

Sight along fence.

app 60° 20' West.

SWILSONS HOLE SURVEY

Station	Distance Feet	Foresight [True North]	Depth below entrance, Feet	Hor. Dist. Feet	Notes
A	46.5'	325°	[Entrance 00.00 Feet.] 380 (altimeter) 388 (corrected)	46.5' ^{side} [Sample 380]	A is big rock just off the streamway beyond Duck I, Time 1.1 hours.
B	36.0	40°	388	31.2	B is end of Howards dig. C is viewed from 2 yds up pass to right.
C	85.0	30°	365	77.4	C is bottom of oxbow. stream sharp left. D is viewed through oxbow.
D	10.0	—	320 (altimeter) 330	—	D is foot of 10' climb. Time 1.5 hrs.
E	32.0	320° 320	320	32.0	E is top of the 10' climb.
F	12.0	350°	320	11.0	F is junction with descending hole
G	36.0	68°	325	34.5	G is lip at bottom of hole
H	30.0	95°	315	28.9	H is viewed from 2 yds forward & right from G.
I	45.0	88°	307	43.5	
J	51.0	61°	285	48.8	 sharp corner on entering Calcutta
K	34.0	115°	265 (altimeter) 280	34.0	K is sharp corner on entering Calcutta. Time 2.1 hrs
L	38.0	355°	285	37.5	L is point in mid-air 10' beyond chimney down into Black Hole.
M	39.0	122°	270 (altimeter) 291	38.5	M is corner at Thunderbolt Depot. Time 3.0 hrs
N	61.0	350°	285	61.0	N is next corner
O	40.0	345°	288	40.0	O is beyond cave pearl cavities.

AUGUST

12th

1950.

Sta.	Distance	Bearing	Depth below Entrance	Horiz Distance	Notes
P	72.0	340°	290	72.0	Q is viewed from a point 1 yd right of P.
Q	28.0	355°	270' (altimeter) 292	28.0	Q is in the stream in Well Chamber, 60' upstream from Well. 32 hrs
R	27.0	076°	289	26.5	R is just beyond the fine cascade.
S	20.0	105°	287	20.0	S is just beyond a 2' high wide part of the passage
T	18.0	005°	286	18.0	T is a sharp bend.
U	75.0	350°	285	74.5	Passage in roof after 60'.
V	45.0	115°	278	44.5	V is bend to right just after cascade.
W	32.0	150°	272	32.0	W is 20' beyond a low crest in mud water ~ 20' beyond lovely cascade
X	30.0	165°	269	29.5	Squeeze after 12'.
Y	80.0	135°	265	79.5	Y is at entrance to the half left bend.
Z	30.0	108°	230' (altimeter) 255	30.0	Z is at entrance to 1/2 left bend.
AA	55.0	125°	253	55.0	Time 3.6 hours Side passage off with bearing 65°
BB	46.0	115°	251	45.5	BB is just before heap of muddy rocks
CC	22.0	21°	249	19.6	CC is in extreme corner at foot of bend to left.
DD	30.0	352°	239	49.0	contraction + dig 8' after DD.
EE					EE on far wall of big passage

SWILDONS HOLE SURVEY

Station	Distance	Foresight	Depth	Horiz Dist.	Notes
EE	60.0	75°	200 (altimeter) 229	58.5	EE is on the far wall of the big passage Time 4 1/2 hrs
FF	41.0	16°	210	37.8	
GG	58.0	335°	200	57.2	
HH	63.0	20°	160 (altimeter) 190	60.0	Time 4 1/2 hrs.
II	30.0	001°	140 (altimeter) 171	29.5	Time 4 1/2 hrs
JJ	32.0	355°	167	31.5	JJ is foot of W stalagmite flow.
KK	55.0	40°	161	52.5	KK is end of a choke. KK was foot of W stalagmite flow.
LL			110 (altimeter) 145		LL is top end. Time 5 hrs.
Bearing of The Well + passage 81' long beyond is 335°.					
MM			235 (altimeter) 280		Depth taken on return Time 6 1/2 hrs.
L	38'				Top of BH as before.
MM	39'	125°	323 250	39.0	MM vertically below L chamber extends to camp 12' back in direction NN-MM
NN	33'	175° 160°	325	31.8	NN is just beyond the Flying Buttoress.
OO	33'	193°	334	30.5	Passage junction 2 yards beyond OO
PP	39'	285°	346	38.0	Looking down stream tunnel
QQ					

AUGUST 12th 1950.

Station	Direction	Forenight	Depth	Horiz Dist.	Notes
QQ	36	255°	355	34.5	See
RR	24	240°	365	20.8	
SS			320 (altimeter) 376		Swamp 2 yds on. Time 8 hours.
OO	33	260°	347	32.0	Sight taken 2 yards beyond OO.
TT	36	267°	356	34.5	
UU			320 (alt) 388 - 50 (alt)		choked 5 yards beyond. Swamp I near side Time 9.7 hrs Entrance: Time 11.25 hrs.

Barograph reading during this time shows gradual fall of pressure for the first 8 or 9 hours, then a level or slightly rising line:—

CHEDDAR GORGE SURVEY.

STA.	I.S.	B.S.	Bearing	Vertical Circle	Distance.
(A) - B	280°	099°30'	279°45'	-2°15'	223'6"
(B) - C	216°	085°40'	215°50'	-3°05'	232'
(C) - D	185°40'	265°30'	185°35'	-1°45'	108'
(D) - E	241°10'	060°10'	240°40'	-2° -	203'
(E) - F	311°30'	120°30'	311° -	-2°45'	231'
<hr/>					
(F) - G	283° -	103° -			492'6"
(F) - G	336°40'	156°30'	336°35'	-1°50'	100'
(G) - H	283° -	103° -	283° -	-2°40'	492'6"
(H) - I	273° -	93° -	273° -	-2°30'	383'
(I) - J	229° -	47°30'	228°15'	-1°45'	141'
(J) - K	262° -	81° -	261°30'	-4°30'	192.5'
(K) - L	304° -	123° -	303°30'	-2°40'	154'
(L) - M	261° -	78°30'	259°45'	-2°45'	179'

DEC 19th 1950

Horiz Dist Vert Dist Alt.

Notes.

223' -8.8' Alt.

A is 2'3" above B.M. 502.6' opposite Bone Hole. 5' above road.

231'6" -12.2' 493.8

B is 3' above road level.

108' -3.3' 491.6

C is 3' above road level.

202'9" -7.1' 478.3

D is 3' above road level. 20'-30' beyond wall end.

230.5' -11.1' 471.2

E is 4' above road level.

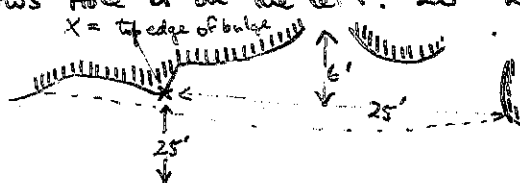
600' -3.2' 460.1

F is 3' above road level

492' -22.9' 456.9

G is 2' above road level

at 116' Sows Hole is on the left. 25' horizontally. 2' above road level.



Alt. of X = 451.5'

at 208' there is a fissure // to the bedding 18' above road level on the left. 6' deep. Horiz dist. 68.5' Alt = 462'.

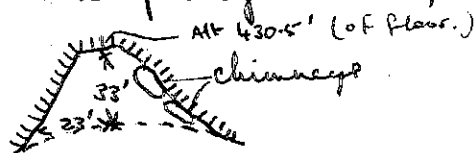
Bedding plane (?) well developed 23' up on left, large alcove at 306' (30' horiz) + 339' (30' horiz) Alt = 466' + 465'

382.5' -16.7' 434.0

H is 3' above road level, Root of Nods dry valley.

at 80' Pigs Hole is on the left. end is 6' above road level.

Horiz dist to middle of overhang = 58'. To innermost point = 81'. Overhang is symmetrical, to each side 23'.

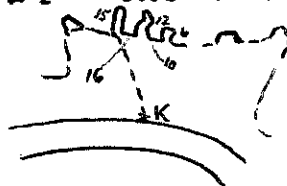


141' -4.3' 417.3

I is 2' above road level. East end of big rock.

192' -15.1' 413.0

J is 2 1/2' above road level.



K to 15' cave. = 106'. FS. = 167'.

Vert. \angle = $+31^{\circ}$

Horiz Dist = 90.8' Vert. Dist. = 54.5'

Alt. 452.4'

154' -7.1' 397.9

K is 2' above road level.

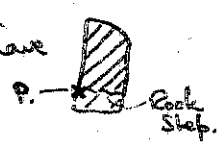
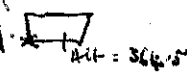
178.8' -8.6' 390.8

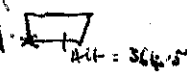
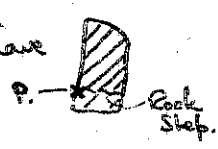
L is 2.5' above road level. Within 20' of unlocated B.M. 392.5'

STA	F. S.	B. S.	BEARING	VERT CURVE	DISTANCE
(M) - N	158°	338°30'	158°15'	+15°30'	117'
(H) - O	249°	68°15'	248°40'	-1°50'	245'
(C) - P	161°30'	340°50'	161°10'	+11°50'	121'
(O) - Q	217°	35°30'	216°15'	-3°15'	229'
(Q) - R	260°20'	79°30'	259°50'	-4°30'	212'
(P) - R	205°30'	24°20'	204°55'	-5°	258'6"
(P) - S	192°50'	—	192°50'	+12°40'	335' 335'
(R) - T	290°	109°30'	289°45'	-6°15'	104'
(T) - U	327°	145°	326°	-8°	215'
(U) - V	249°50'	68°15'	249°	-5°30'	112'
(V) - W	197°	16°30'	196°45'	-3°35'	176.5'
(W) - X	267°50'	87°40'	267°45'	-5°20'	482'
(X) - Y	228°15'	47°	228°50'	-5°15'	174'
[0-2	308°30'	129°	208°45'	-13°14'	—
[1-3	336°	156°20'	236°10'	-21°	—
(Y) - Z	276°	95°30'	275°45'	-3°20'	178.5'
(Y) - @	013°	—	013°	+22°	—
(Y) - @	351°	—	351°	+20°	—
(Z) - @	042°	—	042°	+19°	—
(Z) - @	018°	—	018°	+21°	—
(Z) - AA	232°	51°	231°30'	-2°15'	213'

HORIZ DIST VERT DIST

NOTES.

112.7'	+31.2'	415.1 $M = 383.9$	M is 3' above road. N is centre of roof of entrance to Reservoir Hole. Joint in roof at 198°
244.8'	-6.4'	$M = 383.9$	
118.4'	+24.8'	$O = 377.5$	O is 4' above road. P is cut of White Spot Cave
228.5'	-12'	$P = 402.3$	
211.5'	-16.6'	$Q = 364.5$	Q is 3' above road level. At 47' there is a hole at st. 4 to the South, 8' above Q, 31' from traverse, 6' long. Scalloping shows flow inward. At 58' hole at st. 4's on S. 4' up, 33' away. At 170' there are big horiz. slickensides on S. side. 
258'	-22.56	$Q = 364.9$	P is 4' above road level.
326.5' 326.5'	+72.5' 72.5'	$S = 420.4$	S is a shelter high up on the South. $20' \times 20'$
102.2'	-18.5'	$R = 325.3$	R is 3' above road level.
213'	-29.9' 28	$T = 306.9$	T is 3' above road level.
111.5'	-10.7'	$U = 276.4$	U is on edge of road, about 25' at 62° from the unlocated $87^{\circ}27'$ and about 1' above
176'	-11'	$V = 269.3$	V is 2' above road
480'	-44.7'	$W = 258.3$	W is 4' up. At 329.8' is a fissure 12' long 70' away at st. 2's on the North side. Direction 15° . Alt. -224'
173'	-15.9'	$X = 213.6$	X is at E. corner of big square rock. 2'6" up above road but 54' straight in are high horizontal slickensides in vert. plane running 235°
<u>314</u>	<u>77.3</u>		① is a point four feet N. of small cave entrance. Cave goes in 10' due S. 2. is the entrance to the fissure mentioned in (W)-X. 3. is a point 159' along W-X, and 9' to N. at st. 4's. Also 5' higher than traverse.
<u>179</u>	<u>-68.6</u>	$O = 309'$	
178'	-10.4'	$Y = 197.7$	Y is 3' above road level.
—	—		② is big slickenside
—	—		③ is big slickenside
—	—		④ is big slickenside
—	—		⑤ is big slickenside
212.5'	-8.4'	$Z = 187.3$	Z is 4' above road level. B.T. 180.2 is 4' back along traverse from A.T. At 34' back from A.T. is fissure on South, 20' away at right 4's, 47' deep, direction 178° .



} in quarry.

STA	F.S.	B.S.	Bearing	Vert. Circle	Distance
(AA) - (AB)	197° 15'	16° 30'	196° 50'	-3° 30'	241'
(AH) - AB	264° 30'	83°	263° 45'	-34° 45'	—
(H) - AC	302° 30'	122° 30'	302° 30'	-31° 30'	—
(BT 1002) - AC	—	32° 40'	212° 40'	-4° 15'	96.5'
(AB) - AD	241°	60° 40'	240° 35'	-4° 15'	320.5'
(AB) - AE	213° 20'	37° 50'	218° 05'	+18° 20'	202.5'
(AE) - AF	025° 30'			-2° 30'	
(AE) - AG	348° 30'			+9° 30'	
(AE) - AH	157° 20'	338° 20'	157° 50'	+39° 45'	133' 6"
(AH) - AI	178° 10'	35° 4'	178° 35'	+40° 20'	30'
(AI) - AT	185°	—	185°	-13° 30'	28.5'
(AT) - HKL	257°	—	257°	+6°	88'
(AH) - AF	013°			-14° 30'	
(AH) - AK	284° 10'	103° 30'	283° 50'	-5° 10'	171'
(AD) - AL	279° 20'	99°	279° 10'	-4° 15'	374.5'
(AL) - AM	174° 30'	354°	174° 15'	-0° 50'	110'
(AL) - AN	217° 30'	—	217° 30'	-7°	85'

NOTES.

AA is 6' above road level.

$$H_1 = 318.5$$

H₁ is at N. corner of entrance to Honey Hole, 15' wide. There
 alcove 15' further N + 30' further E. Cave goes in 25' at 95°
 from middle of entrance, narrowing to a fissure. Indefinite
 ? scalloping might show inward flow!

$$Ac = 173.0$$

Cooper Hole.

46 = 1654

$$Alt = 134' \text{ (at entrance)}$$

43 = 1416

A.P. is at Pride Evans Hole 2' on floor.

AG is at Sun Hole  in roof.

PE - 206.8'

AE is in corner of path up grass slope,

• 2924

NS - 304.9'

HI is 4' higher than the lowest point of the entrance bank at Great Jones Hole. ~~mark~~ - AT (at floor level.)

$$4\mu = 823.4$$

"Hole" is one of a group of four in an icy covered cliff

AI = 311.5

A+ 91' is a large overhang to the S, 25' away horizontally and vertically.
at A+ 8's.

ДВ - 141-6

AL: 115-0

AL is 3" above road level.

AR = 114.0

APC is 6' above road level AN is S.E. corner of house N. of
Gonghus.

AN = 10578 (previously surveyed.) -B on p. 14.

CHEDDAR GORGE SURVEY, cont'd. Jan⁸ 1952.

STA	F.S.	B.S.	Bearing	Fore Climo	Dist	Horiz	Vert	Altitude
(A) - AP		127° 40'	307° 40'	-3° 30'	107.1'	106.9	-6.5	AO = 109.6
(AP) - AQ	249° 50'		249° 50'	-3° 40'	124.0	123.8	-8.0	AP = 103.1
(AQ) - AR		005 50	185 50	-10 30	29.0	28.5	-5.3	AQ = 95.1
(AR) - AS		062 40	242 40	+3 30	69.7	69.5	+4.2	AR = 89.8
(AS) - AR'	145 00		145 00	+3 00	63.7	63.5	+3.3	AS = 99.3
(AR')								AR' = 93.1
(AS) - AT	175 45		175 45	+0 35	49.9	49.9	+0.5	AS = 99.3
(AT)								AT = 99.8
(AS) - AV	289 50		289 50	-9 40	46.5	45.8	-7.8	AS = 99.3
(AV) - AY	203 00		203 00	-11 25	23.0	22.6	-4.5	AV = 91.5
(AY)								AY = 87.0
(AO) - AW				-8 35	52.6	52.0	-7.8	AO = 109.6
(AW) - AX				-2 20	32.5	32.4	-1.4	AW = 101.8
(AX)								AX = 100.4

January 7th 1952.

(AN) - AY	023 00	203 00	+7 25	196.5	194.9	+25.3	AN = 105.8
(AY) - AZ	182 40	182 40	+0 25	84.5	84.5	+0.6	AY = 131.1
(AZ) - BA	259 10	079 10	+9 00	11.5	11.4	+1.8	AZ = 131.7
(BA)							BA = 133.5

February 17th 1952.

(AD) - BB	110 50	110 50	+37 35	218.9	174.0	+133.8	AD = 141.6
(BB) - BC	292 00	112 00	+13 00	42.6	41.5	+9.6	BB = 275.4
(BC)							BC = 285.0

Feb 18th 1952. Check traverse Goughs to Great Dones.

(C) - i	122 50	302 50	+3 00	28.8	28.6	+1.5	C = 107.7
(i) - ii	014 00	014 00	+2 00	80.6	80.2	+2.8	i = 109.2
(ii) - iii	195 20	015 20	+1 00	218.6	218.3	+3.8	ii = 112.0
(iii) - iv	102 05	102 05	+4 50	336.0	334.0	+28.4	iii = 115.8
(iv) - v	034 45	214 45	+21 30	177.8	165.2	+65.0	iv = 144.2
(v) - vi	169 00	169 00	+36 00	83.0	67.2	+48.8	v = 209.2
(vi) - vii	037 00	217 00	+41 40	28.6	21.4	+19.0	vi = 258.0
(vii) - viii	112 00	112 00	+25 00	57.1	46.4	+21.6	vii = 277.0
(viii) - ix	029 30	209 30	+32 10	28.4	24.0	+15.1	viii = 298.6
(ix) - AT	179 50	179 50	-14 00	25.4	24.6	-6.1	ix = 313.7
(AT)							AT = 307.6

July 12th 1963 Goughs to Coopers. Colin Painter

AN - 2	179 30	114 30	244 30	+4 00	53.6			
2-2		184 00	224 00	+1 40	71.8	53.1	+3.7	105.8
2-3		205 15	025 15	+2 55	130.3	130.1	+6.6	109.5
3-4	327 20	147 40	327 30	+2 30	72.1	71.9	+3.1	116.1
4-5	046 20	226 15	046 20	-0 10	92.5	92.5	-0.3	119.2
5-6	106 30	286 00	106 15	+1 50	109.2	109.1	+3.5	118.9
6-7	104 40	284 30	104 35	+5 35	182.6	181.7	+17.8	122.4
								140.2

Readings magnetic variation $1^{\circ}30'N$ (calibrated)

Notes.

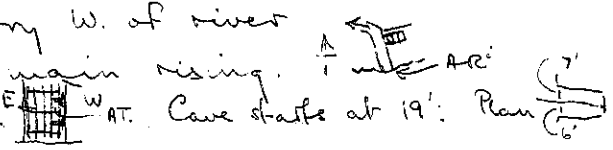
AO is corner of Gough's guide room building nearest the cave, 1.9' above floor level.

AQ is on wall 1' NW of wall junct.

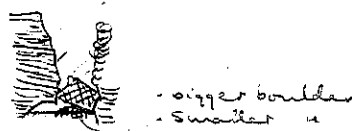
BY 90.3 is 4.8' below the level of AQ on W. wall of house over river.

AR is on an ivy-covered promontory W. of river

AR' is the East edge of the main rising.

AT (= F) is on the gate of Sayer's Hole.  Plan $\frac{7}{6}$ Section $\frac{7}{6}$

AV is Rising No 2, at water level ^{today} on top of smaller boulder



AX is the middle bar on the post supporting the rails above Skeleton Fct.

AN is cottage SW corner, see p. 34. at ground level.

AY on roof of Gough's restaurant. Ent. Gough's Old at 48'.

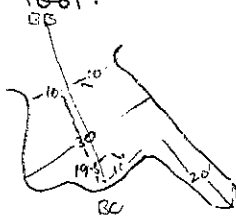
AZ is in middle of small chamber inside entrance to Gough's Old cave.

BA = Sta. XX of p. 12. 2' above floor, 3' below roof.

AD = Sta AD of p. 33

BB is in front of Soldiers Hole.

BC is back of Soldiers Hole.



C is corner of guides room, at floor level. = Sta C of p. 13.

i is top of Gough's steps.

ii is on the S. wall of the road.

iii is on N verge of road at bend.

iv is $\approx 15'$ SW of AD. (p. 33)

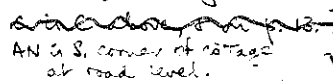
v is close to Sta. AE (p. 33)

AT is entrance of Great Doves, Sta AT of p. 33.

2.7' vert. error in 2,100' = 0.14%

Bearings magnetic, $8^{\circ}45'W$ (calibrated)

4.2' horiz error - - = 0.3%

~~AN is S. corner of cottage at road level.~~  bearings doubtful as road is short

2 is centre of top of wall pillar.

Q4 is cave drillmark (Roadside Hole)

Sta	FS	BS	Bearing	Fore Clin	Dist	Horiz	Vert	Altitude
7-8				-90 00	3.8		- 3.8	140.2
8-9	029 00	209 00	029 00	+ 1 55	76.7	76.6	+ 2.6	136.4
9-10	136 05		136 05	+ 1 25	51.6	51.5	+ 1.3	139.0
10								140.3
7-PE	017 00	198 00	017 30	+ 19 07		176.2		140.2 PE = 200.1 (corrected)
7-Spur	313 00	133 00	313 00	+ 16 00		215.7	+ 61.9	203.1 = Spur
4-Spur	053 45	236 00 (B)	054 30	+ 19 55		232.5	+ 85.0	
Bearings magnetic Variation 8°40' W								
Spur-11		214 45	034 45	+27 25	23.8	21.2	+ 11.0	203.1
11-12	312 00		312 00	+19 40	17.7	16.7	+ 6.0	214.1
12								220.1
11-13	034 30		034 30	+43 25	30.7	22.3	+ 21.1	214.1
13-14		243 30	063 30	+24 10	98.2	89.6	+ 40.2	235.2
14-15	046 40		046 40	+29 35	61.7	53.8	+ 30.4	275.4
15-16		112 00	292 00	+15 20	11.5	11.1	+ 3.0	305.8
16-17	308 30		308 30	+22 30	27.8	25.6	+ 10.6	308.8
17								319.4
PE-18		186 00	006 00	-9 20	14.4	14.2	- 2.3	200.1
18-19	271 00		271 00	+16 10	30.0	28.8	+ 8.4	197.8
19-20	270 00		270 00	+5 Feet	8.0	7.5	+ 5.0	206.2
20								211.2

continued from p. 83		VICARAGE PASSAGE				AFTER	
L22-L24	353 00	+15 00	24.7	23.9	+ 6.4		
L24-L25	006 00			1.5	- 3.0		
L25-L26	006 00	0 00	33.0	33.0			
L26-L27	091 00	-12 00	17.2	16.8	- 3.6		
L27-L28	109 00	0 00	11.5	11.5			
L28-L29	109 00	0 00	42.3	42.3			
L29-L30	083 00	+25 00	79.5	72.0	+ 33.5		
L30-L31	093 00	+25 00	29.0	26.3	+ 12.2		
L31	Above dig.						
		ABANDON HOPE SURVEY				AFTER	
PSF-1	292 00	-12 00	9.2	9.0	- 1.9		
AH1-2	352 00	- 5 00	5.7	5.7	- 0.5		
AH2-3	026 00	- 5 00	6.2	6.2	- 0.5		
AH3-4	354 00	+12 00	31.5	30.8	+ 6.5		
AH4-5	354 00	+14 00	15.2	14.8	+ 3.7		
AH5-6	032 00	+30 00	7.8	6.7	+ 3.9		
AH6-7	330 00	+24 00	8.3	7.6	+ 3.4		
AH7-8	300 00	+23 00	13.9	12.8	+ 5.4		
AH8-9	342 00	-13 00	9.7	9.5	- 2.2		
AH9	start of dig, goes 35' further						

TUNNEL AT THE GRANGE, STREET.

Survey June 29th 1951

Sta.	F.S.	B.S.	Bearing	Distance	V. Circle	Hor. Dist.	Vert. Dist.
(A) - B		223°	043°00' ^{True} 022°30'	27.9'	-4°30'	27.8	-2.2
(B) - C	008°		008°00' 357°15'	9.8'	+2 15'	9.3	+0.4
(C) - D		235°40'	055°40' 045°30'	9.9'	-7°30'	9.9	-1.3
(D) - E	348°30'		348°30' 328°10'	59.2'	-1°15'	59.1	-1.3
(E) - F		257°	077°00' 066°50'	9.5'	-7°30'	9.5	-1.2
(F) - G	605°30'		105°30' 095°20'	13.5'	+3°30'	13.5	+0.8
(G) - H		205°	025°00' 014°30'	17.7'	-8°	17.6	-2.5
(H) - K	358°		358°00' 347°50'	35.0'	-0°30'	35.0	-0.3
(K) - L		250°30'	070°30' 060°20'	15.6'	Fall of 3'	15.5	-3.0
(L) - M	031°10'		031°10' 021°00'	6.1'	Rise of 1.5'	6.1	+1.5
(M) - N		167°30'	347°30' 337°20'	6.6'	Fall of 1'	6.6	-1.0
(N) - O	003°30'		003°30' 359°20'	7.6'	Rise of 1'	7.6	+1.0
shaft rises 5.3' above O							+5.3

March 22 1952.

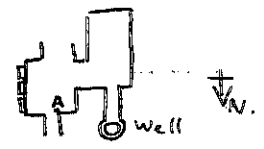
(A) - S	016 00	196 00	24.1	+19 00	22.8	+7.9
(S) - T	052 20	052 20	77.4	+1 15	77.3	+1.7
(T) - U	200 30	020 30	82.3	-1 15	82.2	-1.8
(U) - V	023 10	023 10	41.5	-5 30	41.3	-4.0
(V) - W	163 20	343 20	26.8	-1 15	26.8	-0.6

March 24th 1952.

(P) - Q	222 00	042 00	15.7	Fall of 1.5'	15.5	-1.5
Q - R.	017 00	017 00	24.1	-4 00	23.9	-1.7

All bearings magnetic. $H^\circ 30' W.$

NOTES.




All below ~~at~~ ^A ~~at~~ ^A

- B = -2.2 ~~was~~ 2' up A is corner at entrance, 2' above ground.
- C = -1.8 ~~was~~ 2' up B in middle of a corner.
- D = -3.1 ~~was~~ C is a corner.
- E = -4.4 2' up D is a corner, Gypsum Kab on walls. Roof Fall = hole 10' along ^{from D} on right.
- F = -5.6 E is a corner.
- G = -4.8 2' up F is a gentle bend.
- H = -7.3 G is a corner.
- I = -7.6 2' up H is 2' before gentle bend with roof fall on it. & squeeze.
- L = -10.6
- M = -9.1 2' up L is a bend.
- N = -10.1 M is bend.
- O = -9.1 N is a bend. O is far side of shaft.



~~at~~ 3.8

 Plan.



ie. Fall of 9 feet between entrance & end.

A as above.

- S = +7.9
- T = +9.6
- U = +7.8
- V = +3.8
- W = +3.2

- P = -9.1 P is 1.5' NW of O.
- Q = -10.6 Q is 4' beyond squeeze
- R = -12.3 R is on wall 1.5' above floor.

EBBOR GORGE LEVELLING JUNE 1951.

CLINO

STA	F.S.	B.S.	Mean	Dist	Hor. Dist	Vert. Dist	Ht. Sta. above Floor of valley	Alt.	NOTES
① - 2.	+1° 15'	-1° 45'	+1° 30'	100'	100	+2.6'	1.5'	240.2	① by big sycamore 300 yds up valley from road.
② - 3	+2 00	-2 15	+2 10	100	100	+3.8	2.0	242.3	
③ - 4	+2 45	-3 00	+2 50	100	100	+4.9	2.5	245.6	
④ - 5	+1 30	-2 00	+1 45	100	100	+3.0	3	250.0	
⑤ - 6	+0 15	-0 30	+0 20	100	100	+0.6	3	253.0	
⑥ - 7	+1 45	-2 00	+1 50	100	100	+3.2	2	254.6	
⑦ - 8	+2 00	-2 15	+2 10	100	100	+3.6	2	257.8	
⑧ - 9	+2 45	-3 20	+3 00	100	100	+5.2	3	260.4	
⑨ - 10	+2 00	-1 15	+1 40	100	100	+2.9	5	263.6	⑨ by fence
⑩	+1 30	-1 30	+1 30	100	100	+2.6	2	269.5	
⑪	+1 45	-2 05	+1 55	100	100	+3.3	1.5	272.6	
⑫	+3 00	-3 20	+3 10	100	100	+5.5	1.5	275.9	
⑬	+2 30	-3 00	+2 45	100	100	+4.8	2.5	280.4	
⑭	+1 45	-2 00	+1 50	100	100	+3.2	3	284.7	
⑮	+2 30	-2 40	+2 35	100	100	+4.5	1.5	289.4	
⑯	+2 30	-2 45	+2 40	100	100	+4.6	1	294.4	⑯ is 1' vertically below junction of D.L. path.
⑰	+2 40	-3 00	+2 50	100	100	+4.9	-	300	
⑱	+3 15	-3 45	+3 30	100	100	+6.1	-	304.9	
⑲	+4 50	-4 40	+4 45	100	100	+8.3	-	311.0	
⑳	+3 30	-3 40	+3 35	100	100	+6.3	-	319.3	
㉑	+4 00	-4 20	+4 10	100	100	+7.3	-	325.6	
㉒	+6 45	-7 05	+6 55	100	100	+12.0	-	332.9	In Lst
㉓	+17 00	-16 45	+16 50	100	96	+29.0	-	344.9	Steepest slope
㉔	+10 30	-10 45	+10 35	41	41	+7.5	-	373.9	
㉕	+5 20	-4 50	+5 05	59	59	+5.2	-	381.4	
㉖	+6 30	-6 00	+6 15	100	100	+10.9	-	386.6	
㉗	-3 00	+3 00	-3 00	100	100	-5.2	4	393.5	
㉘	+9 50	-9 30	+9 40	100	100	+16.8	-	392.3 392.3	
㉙	+15 00	-15 15	+15 10	50	48	+13.1	3	406.1	
㉚	+0 45	-0 45	+0 45	50	50	+0.6	3	419.2	
㉛	+14 15	-14 00	+14 10	100	97	+24.5	-	422.8	
㉜	+25 30	-24 15	+24 50	50	45	+21.0	-	447.3	
㉝	+23 00	-23 00	+23 00	31	28	+12.1	-	468.3	
㉞	+25 00	-24 30	+24 45	79	72	+33.1	-	480.4	solid at 65' steepens after 50'
㉟	+36 45	-37 15	+37 00	50	40	+30.1	-	513.5	
㊱	+4 50	-4 40	+4 45	100	100	+8.3	3	540.6	
㊲	+5 50	-5 45	+5 50	100	100	+10.2	-	551.9	
㊳	+1 15	-1 15	+1 15	100	100	+2.2	2.5	559.6	
㊴	+7 00	-6 50	+6 55	100	100	+12.0	-	564.3	
㊵	+8 00	-8 00	+8 00	50	50	+7.0	-	576.3	Fence at 45'
㊶	+1 15	-1 45	+1 30	50	50	+1.3	-	583.3	
㊷	+1 00	-1 10	+1 05	100	100	+1.9	-	584.6	
㊸	+2 00	-2 30	+2 15	100	100	+3.9	1	585.5	
㊹ - 45	+2 30	-2 30	+2 30	100	100	+4.4	-	590.4	
㊺ - 46	+7 50	-7 30	+7 40	50	50	+6.7	-	594.8	

↑
S
C
R
E
F
↓

STA	B.S.	B.S.	Mean	Dist	Hor Dist	Vert Dist	Ht. Sta	Alt. Elev.	NOTE S.
(46) = 47	+ 0 15	- 0 25	+ 0 20	50	50	+ 0.3	1.5	600	
(47)	+ 2 45	- 3 05	+ 2 53	50	50	+ 2.6	-	601.8	
(48)	+ 6 30	- 6 15	+ 6 20	50	50	+ 5.5	-	604.4	
(49)	+ 2 10	- 2 30	+ 2 20	100	100	+ 4.1	1.5	608.4	
(50)	+ 2 30	- 2 30	+ 2 30	100	100	+ 4.4	-	614.0	
(51)	+ 5 00	- 5 15	+ 5 05	100	100	+ 8.9	-	618.4	Wall at 20'
(52)	+ 5 30	- 5 20	+ 5 25	100	100	+ 9.4	3	624.3 624.3	
(53)	- 2 40	+ 2 45	- 2 45	50	50	- 2.4	6	630.7	
(54)	+ 5 50	- 5 45	+ 5 45	50	50	+ 5.0	2.5	631.8	
(55)	+ 4 40	- 5 10	+ 4 53	100	100	+ 8.6	3	636.3	
(56)	+ 4 30	- 4 20	+ 4 25	100	100	+ 7.7	4	643.9	
(57)	+ 3 00	- 3 00	+ 3 00	100	100	+ 5.2	5	650.6	
(58)	+ 4 30	- 4 50	+ 4 40	100	100	+ 8.1	2	658.8	Wall joins path at 40'
(59)	+ 2 25	- 3 00	+ 2 45	100	100	+ 4.8	3	665.9	
(60)	+ 7 30	- 8 10	+ 7 50	50	50	+ 6.8	-	673.7	At valley junct.
(61)	+ 10 30	- 11 20	+ 10 55	100	98	+ 18.4	-	680.5	
(62)	+ 9 40	- 10 00	+ 9 50	50	50	+ 8.5	1	698.4	
(63)	+ 3 30	- 3 50	+ 3 40	100	100	+ 6.4	2.5	705.4	
(64)	+ 3 40	- 3 50	+ 3 45	100	100	+ 6.5	2	712.3	
(65)	+ 3 20	- 3 40	+ 3 30	100	100	+ 6.1	2.5	718.3	
(66)	+ 9 15	- 9 50	+ 9 35	100	100	+ 16.6	-	726.9	
(67)	+ 0 20	- 1 30	+ 0 55	50	50	+ 0.8	6	737.5	
(68)	- 3 00	+ 2 30	- 2 45	50	50	- 2.4	4	740.3	
(69)	+ 4 35	- 4 55	+ 4 45	100	100	+ 8.3	-	741.9	
(70)	+ 2 30	- 2 40	+ 2 35	50	50	+ 2.3	2.5	747.7	Wall at 20'
(71)	+ 4 30	- 5 10	+ 4 50	100	100	+ 8.4	1	757.5	
(72)	+ 4 10	- 4 45	+ 4 25	100	100	+ 7.7	-	760.9	
(73)	+ 3 40	- 4 10	+ 3 55	100	100	+ 6.8	-	768.6	
(74)	+ 2 30	- 3 20	+ 2 55	100	100	+ 5.1	1	774.4	Crosses wall into Rickett's Old Congl. shale.
(75)	+ 1 30	- 2 15	+ 1 55	100	100	+ 3.3	1	779.5	
(76)	+ 1 00	- 1 40	+ 1 20	100	100	+ 2.3	-	783.8	
(77)	+ 1 20	- 1 30	+ 1 35	100	100	+ 2.8	-	786.1	
(78)	+ 1 15	- 1 45	+ 1 30	100	100	+ 2.6	-	788.9	
(79)	+ 1 40	- 1 50	+ 1 45	100	100	+ 3.0	-	791.5	
(80)	+ 0 30	- 1 00	+ 0 45	100	692.4	+ 1.3	1	793.5	by Tips
(81)	+ 4 40	- 4 40	+ 4 40	100	702.4	+ 8.1	-	795.8	
(82)	+ 0 30	0 00	+ 0 15	100	712.4	+ 0.4	2.8	796.9	
(83)	- 0 40	0 00	- 0 20	100	722.4	- 0.6	6	798.3	
(84)	+ 1 30	- 1 30	+ 1 30	100	732.4	+ 2.6	2	801.7	20' N of E end of H.P.M.
(85)	- 0 40	+ 0 10	- 0 25	100	742.4	- 0.7	1.5	804.8	
(86)	+ 0 40	- 0 30	+ 0 35	100	752.4	+ 1.0	-	805.6	
(87)	+ 0 50	- 1 00	+ 0 53	100	762.4	+ 1.6	-	806.6	<100's> 20'
(88)	+ 0 50	- 1 20	+ 1 05	100	772.4	+ 1.9	-	808.2	
(89)	+ 2 00	- 2 00	+ 2 00	100	782.4	+ 3.5	-	810.1	
(90)	0 00	+ 0 10	- 0 05	100	792.4	- 0.1	2	811.6	On S. wall of track
(91)	+ 0 30	- 0 45	+ 0 40	100	802.4	+ 1.2	-	813.5	(Vert error 5' too low) (Not worth adjusting)
(92) - 93	+ 0 45	- 1 10	+ 1 00	100	812.4	+ 1.7	-	814.7	

DOWNHEAD

SWALLET

STA.	HT. RP.	Dp. FL.	Width L.	Width R.	F.S.	B.S.	Bearing.	Dist.	Forward Chino.
(A) - B	-	-	-	-	165° 165°	-	165° 165°	10.8'	-21°
(B) - C	3'	3'	-	-	262°	-	262°	9.6'	-15°
(C) - D	4	1	1'	0.6'	270°	-	270°	8.5	-12°
(D) - E	1	1	-	-	331°	-	331°	5.7	+3°
(E) - F	-	-	-	-	-	-	-	8.2	-90°
(F) - G	-	-	-	-	183°	-	183°	6.4	level
(G) - H	-	-	-	-	182°	-	182°	22.0	-8°30'
(H) - I	2	0.7	-	-	096°	-	096°	20.5	+5°

I

EBBOR GORGE LEVELLING cont.

STA.	F.S.	B.S.	Mean	Dist.	Hor. Dist.	Vert. Div.	Ht. Sta.	Alt. Elev.	Notes.
(93) - 94	+1 15	-1 30	+1 20	100	8224 8224	+2.3	-	816.4	
(94)	+0 50	-1 00	+0 55	100	8224 8224	+1.6	-	818.7	
(95)	+0 45	-1 15	+1 00	100	8424	+1.7	-	820.3	
(96)	+3 30	-3 30	+3 30	60	8484	+3.7	-	822.0	
(97)	-1 30	+1 00	-1 15	100	8584	-2.2	34	822.7	On wall. Valley wide 10'
(98)	+0 40	-1 10	+0 55	100	8684	+1.6	-	823.5	
(99)	+0 30	-1 00	+0 45	100	8784	+1.3	-	825.1	
(100)	+0 20	-1 00	+0 40	100	8884	+1.2	-	826.4	Valley 150' wide.
(101)	+0 45	-1 10	+1 00	100	8984	+1.7	-	827.6	S.D. 3' deep 40' wide
(102)	+0 30	-1 00	+0 45	100	9084	+1.3	-	829.6	By barbed wire fence

SURVEY.

Compass readings true.

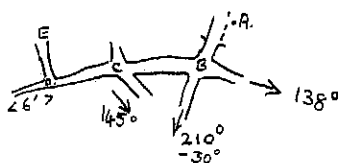
Hor. Dist. Vert. Dist. Dp. below entrance.

Notes.

10.1 -3.9 -

A is 1' above the left bank of the stream and 3' up above the stream. The entrance of the swallet is 5' away in the direction of B.

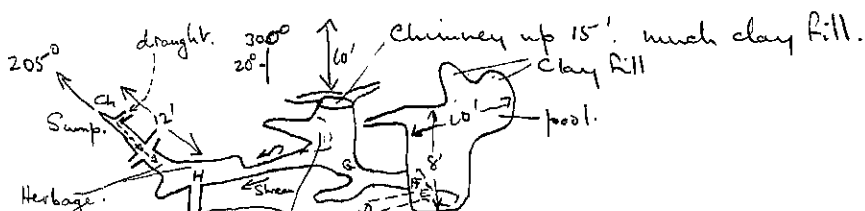
9.3 -2.5 3.9



8.3 -1.8 6.4

5.7 +0.3 8.2

- -8.2 7.9



6.4 - 16.1

21.8 3-3-1 = 2.3

Sump is 20' below entrance

~~16.4~~ 16.1

20.4 +1.8 16.6 18.4



16.6

21st July 1957.

SWILDONS

HOLE

STA.	Ht RF	Dp Fl	looking forward		F/S	B/S	Bearing	Distance	Fore Chino
			Width L.	Width R.					
(A) - B	20'	-	4'	4' (19' in area)	/	103 093	282 282°	21.0	+8.30°
(B) - C	6	3.5	3	6	322 30 312 30	/	322 30 312 30	27.0	-9.30°
(C) - D	7	-	4	2	/	083 073	263	37.0	rise of 1.5 feet
(D) - E	25	2	/	10	9 182 30	/	192 30 182 30	16.2	+4.30
(E) - F	25	4.5	6	/	/	078 068	258 248	47.0	-5.30
(F) - G	4	2	0.5	3 (30 in B. Place)	292 282	/	292 282	48.0	Fall of 2.5 feet
(G) - H	2.5	0.5	3.5	7	/	159 149	339 329	36.0	level
(H) - I	15	1	10	3	247 237	/	247 237	31.0	-2.30
(I) - J	15	1	8	2	/	095 085	275 265	26.0	+2.00
(J) - K	8	3	1	2	320	/	320	26.5	+1.00
(K) - L	25	4.5	-	4	/	193 183	013 003	17.5	-9.00
(L) - M	20	3	2	2	299 289	/	299 289	33.0	-3.00
(M) - N	15	7	4	-	/	142 132	322	43.0	-7.30
(N) - O	25	3	2	1	281	/	281 271	15.5	-2.00
(O) - P	40	4.5	2	2	/	127	307 297	56.0	-5.00
(P) - Q	40	3	2	3	283	/	283 273	15.8	-0.15
(Q) - R	40	4	4	•	/	037 027	217 207	15.3	Fall of 4 feet
(R) - S	40	-	-	4	310 300	/	310 300	39.5	rise of 4 feet
(S) - T	12 11	4.5	8	-	/	058 048	238 228	39.6	-2.30
(T) - U	2	2.5	15	6	148 138	/	148 138	49.0	Fall of 7 feet
(U)	1.5	1.5							
(2) - B	-	1	1	0.5	/	326	146 136	30.4	level
(3) - Y	4	1	10	2	248 238	/	248 238	37.5	-6.00

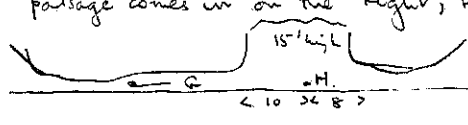
SURVEY continued.

Compass bearings

magnetic
true
11° 30' W.

Hor. Dist. Vert. Dist. Dp. below Sump I. 03.

Notes.

20.8	+3.1	404.7	424.4	A is at the base of the cable spike on the downstream side of Sump I.
20.8 26.7	-4.5	407.8	+3.1 407.5	B is on a rock at upstream end of pool.
47.5 37.0	+1.5	402.3	-1.4 406.1	C is on edge of pool 10' before Duck I.
80.5 16.1	+1.3	404.2	+0.1 406.2	D is in stream. Big rock (start of New Series survey) 10' away at 350° Big passage starts as continuation of Howards Dig.
100.6 46.8	-4.5	406.1	+1.4 407.6	
147.4 48.0	-2.5	401.6	-3.1 404.5	At 40' the roof lowers suddenly to Creep I. The big Bedding Plane passage comes in on the right, from -5' to 40'.
195.4 36.0	-	399.1	-5.6 392.5	 Section
221.4 31.0	-1.3	399.1	-5.6 392.5	
262.4 26.0	+0.9	397.8	-6.9 389.9	
288.4 26.5	+0.5	397.7	-6.0 389.0	Pots
314.9 17.3	-2.7	399.2	-5.5	Pots.
332.2 33.0	-1.7	396.5	-8.2	L is at foot of climb to Approach passage. Clay fill remains 6' up on left wall.
365.2 42.7	-5.6	392.8	-9.9	Pots.
407.9 15.5	-0.5	389.2	-15.5	Pots
423.4 53.8	-4.9	388.7	-16.0	Pots Very pretty coral on left wall
479.2 15.8	-0.1	382.8	-20.9	
495.0 15.3	-4.0	380.1	-21.0	1.5 foot deep pool starts at P.
510.3 39.5	+4.0	379.7	-25.0	Pool 2.5' deep at R, ends 15' on. Scalloping as in Goughs 15" Sandy Chamber.
549.8 39.6	-1.9	381.7	-21.0	S is marked on wall. At 20' there is a muddy chamber overhead.
589.4 49.0	-1.7	381.8	-22.9	
628.4		380.1	-24.6	Beats seen here Total = 650'
30.4	-	415.7		X is far end of "Piddly Green" passage. At choke strike bearing.
37.3	-3.9	415.7	+11.0	3 is end to P.G. pass, above stakagule kebid.

5th August 1951.

SWILDONS HOLE SURVEY

forward.

STA	HR	DF	WL	WR	FS	B.S.	Bearing	Dist	Fore Chino
⑧ - 8	5	6	15	4	/	085 ⁵ 075	265 ⁵ 255	11.8	-24°
⑧ - A	2	2.3	6	4	257 257	/	257 ¹ 257	36.8	water level
⑨ - V	15	1.5	2.5	15	/	35 006 30 006 30	186 30 176 30	29	water level
⑤ - W	15	-	2	4	141 30 141 30	/	141 30 131 30	33.8	water level
⑥ - X	4	-	0.5 ⁵ 2	48	132 10 132 10	/	132 10 122 10	47	water level
⑧ - Y	12	-	2	10	/	344 354 354	174 164	83.5	Fall 0.7'
⑤	0.4(12)	-	4	2					
① - I	/	/	/	/	089	/	089	22.1	+20°
① - II	1	0.5	8	8	385	/	385	46	-3°
② - III	1	2	4	4	388	/	388	32	+2°
③ - IV	2	1.5	5	2	284 ⁸ 274	/	284 274	27.3 130' hole	Fall 4 Feet
④ - b	/	1	3	/	083 ⁸ 073	/	083 073	43	+15
⑥ - c	/	2	5	7	006 356	/	006 356	20.7	+8
⑦ - d	/	1	2	3	042 032	/	042 032	11.3	+10
⑧ - e	/	0.5	1	/	159 129	/	159 129	18.9	level
⑧ - f	/	/	/	6	245 ⁵ 235	/	245 ⁵ 235	10.3	+60
⑨ - g	/	/	1	1	319 309	/	319 309	6.2	level
⑨ - h	/	/	/	2	237 227	/	237 227	16	+65
⑩ - i	3(8 in area)	1	1	1	329 319	/	329 319	46	level
⑪ - j	/	/	/	/	/	135 ⁴	325 ⁵ 315	11.7	-20
① - 2	/	2.5	/	/	035 ⁵ 025	/	035 ⁵ 025	28.5	+85
② - 3	4	-	2	2	/	230 220	050 040	19.9	+16

CONTINUED

Compass bearing: ~~True~~ 11°30' W
magnetic,
Notes.

Hor. Dist. Vert. Dist. Dp below S.I.


10.8 -4.8 411.8 +7.1

On rocky bank.

36.6 -2.3 407.0 +2.3

⑧ to near side Sump I 11.8' $\delta \frac{1}{4}$ is in post, at stake for cable

⑨ - Far in - - 18'

Lake begins at 10'. 

638.4 29.0 - 380.1 -24.6

667.4 33.8 - 371.6 -26.1

Lake

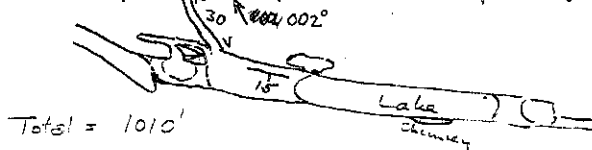
701.2 47.0 - 378.6 -26.1

Bearing from 2' to right. W to near side Duck II = 3.5
W to far - - - = 20.4

745.2 83.5 -0.7 378.6 -26.1

Yat lip of Sump II, 3" air space goes on 10 more.

831.7 377.9 -26.8



20.8 +7.6 381.8 -22.9

45.9 -2.4 384.4 -15.3

Sump on left at 4' back.

32 +1.1 385.5 -17.7

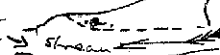
Bearing from 3 feet to left.

27.3 -4.0 382.5 -16.6
in - 382.5

Bearing from 2' to left. Dp below Sump I is 20.6 feet.
iv is Muddy Sump.

Total = 1127'

41.5 +11.1 400.1 -4.6

⑩ is on N. Side of passage just before Creek I 

20.5 +2.9 403.2 +6.5

11.1 +2.0 416.3 ~~+9.4~~

18.9 - 422.0 +11.4

⑪ is where passage rejoins streamway.
(TRUE) (P. 52) - c is FS. 234°, Dist 18', Chino +45°, HD 12.7, VD +12.7
(TRUE)

5.1 +8.9 422.0 +11.4

6.2 - 431.0 +20.3

6.8 +14.5 421.0 +20.3

4.6 - 445.4 +35.8

c is where passage gets too low. $\delta \frac{1}{4}$ 445.0
Total = 1207'

10.9 -4.0 394.0 -9.9

10.9 2.5 +28.4 390.4 +13.9

-13.4 19.1 +5.5 418.0 +

2. is on lip of Approach passage. little passage starts back.

SWILDONS HOLE SURVEY

STA	HR	DF	WL	WR	F.S.	BS	Beang	Dish	Fore Clin
③ - 4	2	1	2	2	² 182	/	¹²² #2	16	+7
④ - 5	2	14	2	4	⁵ 049	/	⁰⁵³ 044	18	+15
⑤ - 6	/	1	/	/	¹ 027	/	⁰¹⁷ 007	9.5	+10
⑥ - 7	2	0.5	3	1	⁴ 036	/	⁰⁴⁶ 036	13.5	+17
⑦ - 8	2	0.5	1	2	⁷ 044 034	/	⁰⁷⁴ 054 074	24.2	+13
⑧ - 9	3	0.5	2	1	³ 127	/	¹³⁷ 127	8.8	+10
⑨ - 10	2	0.5	2	2	⁸ 049	/	⁰⁸⁹ 079	19.8	+15
⑩ - 11	/	0.5	1	3	² 086	/	026	9.0	+12
⑪ - 12	2	0.5	/	/	⁷ 048	/	⁰⁷⁸ 068	10.7	+10
⑫ - 13	2	2	/	1	² 035	/	025	8.5	Fall 2 Feet
⑬ - 14	1	0.5	2	3	⁸ 085	/	085	12.3	+9
⑭ - 15	2	0.5	/	/	⁶ 043	/	⁰⁶³ 053	11.6	+10
⑮ - 16	3	4	2	/	² 185	/	¹²⁵ #5	12	Fall 3.5 Feet
⑯ - 17	14	0.5	3	3	/	265	085	14.5	+6
⑰ - 18	1	1	2	3	² 082	/	022	12.6	+6
⑱ - 19	3	11	2	2	/	/	/	11	-90

AUGUST 1957

Bearing ~~true~~ magnetic, 11° 30' W

Hor Dist. Vert Dist. Dp. below S.I.

NOTES.

+57 15.9 +1.9 426.4 +22 3

+21.6 17.4 +4.7 457.0 +26.9 5

Little passage off to Salt from 4.

39.0 9.4 +1.6 437.8 +33.6 7

48.4 12.9 +4 447.0 +38.2 10

61.3 23.6 +5.4 455.0 +46.2 13

84.9 8.7 +1.5 457.0 +52.6 15

93.6 19.1 +5.1 460.5 +56.1 17

112.7 8.8 +1.9 465.8 +62.2 18

121.5 10.5 +1.9 469.0 +65.1 19

132.0 8.2 -2.0 475.4 +67.0 18

Little passage goes uphill straight on.

140.2 12.1 +1.9 469.4 +65.0 20

152.8 11.4 +2.0 472.2 +69.9 22

163.7 12.0 -3.5 476.9 +72.9 23

Low creep at 4-10 feet. Chamber goes on 15' in same line

175.7 14.4 +1.5 475.8 +71.4 25

190.1 12.5 +1.3 479.6 +74.9 27

202.6 - -11.0 488.0 +76.4

(18) is in crack at top of "11 foot Drop".

Total = 1532'

↑
Trench
up
to
2 feet
deep
in
floor
of
this
passage
↓

SWILSONS HOLE SURVEY. March 30th 1952

STA	H.R.	D.I.F. 2	N.	WR	FS	BS	Bearing	Distance	Fore Clin
(3) - AA						293 40	113 40	278.1	+9 30
(AA) - AB	25	5	8	7	115 30		115 30	24.1	-5 30
(AB) - AC	20	5	6	0.5		277 50	097 50	29.2	+0 30
(AC) - AD	5 to rock jam	2.5	1	7.2	121 00		121 00	10.6	+22 30
(AD) - AE	30	5	5	2		290 00	110 00	48.3	+9 40
(AE) - AF	40	5 to water	3	4	050 30		050 30	17.0	+10 20
(AF) - AG	30	5	-	3		313 00	133 00	20.2	+3 00
(AG) - AH	30	4	4		192 50		192 50	10.1	+11 20
(AH) - AI	30	3	6	0		292 10	112 10	41.6	+4 50
(AI) - AJ	25	3	2	3	138 30		138 30	34.2	+6 30
(AJ) - AK	10	6	1	2.5		286 00	106 00	31.8	+14 30
(AK) - AL	4 (cascades)	10	4	3	044 00		044 00	11.3	-0 30
(AL) - AN									

April 2nd 1952.

Cons - Roy Blewett.

(AL) - AN	8	6	6	0		126 40	306 40	12.8	-4 30
(AN) - AO	12	4	2	4	025 20		025 20	16.8	+26 00
(AO) - AP	8	6	1	2		243 50	063 50	27.7	+12 00
(AP) - AQ	20	4.5	1	3	094 00		094 00	23.2	+10 30
(AQ) - AR	30	6	0	4		316 00	136 00	10.7	-5 30
(AR) - AS	30	4		2	012 20		012 20	26.5	+28 30
(AS) - AT	30	10	6	1		169 30	349 30	38.6 23.3	+10 30
(AT) - AU	8	13	6	1	321 40		321 40	23.3	-4 00
(AU) - AV	25	5	2	6		245 30	065 30	23.3	+9 00
(AV) - AW	30	1.5	7	8	108 30		108 30	24.1	+27 30
(AW) - AX	35	6	8	2		259 40	079 40	14.6	+23 30
(AX) - AY	15	6	10	5	128 00		128 00	15.0	+13 30
(AY)									

August 14th 1952.

Colin.

Cont'd from P. 49. Upper Third Series.

(18) - 19								10.1	-90 00
(19) - 20		1	3	3		355 00	175 00	8.0	+1 00
(20) - 21	3	1	3	2	091 00		091 00	24.8	+23 00
(21) - 22	1	0.5	1.5	3		302 00	122 00	11.2	+10 00
(22) - 23	1	1	2	3	172 40		172 40	25.5	-9 00
(23) - 24	1	3	5	0		248 00	068 00	50.7	+18 00
(24) - 25	3 (30)	1	20	20	046 00		046 00	14.0	-46 00
(25) - 26						293 00	113 00	15.3	-43 00
(26) - 27					061 00		061 00	23.2	-55 00
(27) - 28		5	-	12		015 30	195 30	25.3	-24 30
(28) - 29	3	1	3	4	242 00		242 00	57.0	-23 30
(29) - 30	3	1		3		340 00	160 00	13.7	-3 00
(30) - 31	2	1	5		239 00		239 00	25.4	-19 00
(31) - 32	6	2	5	4		106 00	286 00	11.2	Fall 1 foot
(32) - 33	0.5	0.5		1	182 00		182 00	14.1	-9 00
(33) - 34	0.5	0.5	-	2		339 00	159 00	17.0	Rise 1 foot
(34) - 35	3	2	2			341 00	161 00	13.9	-12 30
(35)									

Colin + Rob.

Bearings

magnetic $^{\circ}30'$ N.

Horiz Dist. Vert Dist. Depth below Sump I.

NOTES.

77.1	+12.9	416.7	+12.0
24.0	+2.3	429.6	+24.9
29.2	+0.3	427.3	+22.6
9.8	+4.1	427.6	+22.9
47.6	+8.1	431.7	+27.0
16.7	+3.0	439.9	+35.1
20.2	+1.1	442.8	+38.1
9.9	+2.0	444.9	+39.2
41.4	+3.5	445.9	+41.2
34.0	+3.9	449.2	+44.7
30.7	+8.0	458.3	+48.6
11.3	-0.1	461.5	+56.6
		461.2	+56.5
12.8	-1.0	461.2	+56.5
15.1	+7.4	468.2	+55.5
27.1	+5.8	467.6	+62.9
22.8	+4.1	470.2	+68.7
10.6	-1.0	477.5	+72.8
23.3	+12.6	476.5	+71.8
38.0	+7.0	483.1	+84.4
23.2	-1.6	482.1	+91.4
23.0	+3.6	484.5	+89.8
21.4	+11.1	492.1	+93.4
13.4	+5.8	500.2	+104.5
14.6	+3.5	505.0	+110.3
		518.5	+113.8
8.0	+0.1	471.0	+66.3
22.8	+9.7	471.1	+66.4
11.0	+1.9	480.8	+76.1
25.2	-4.0	482.7	+78.0
48.2	+15.6	478.7	+74.0
9.7	-10.1	474.2	+89.6
11.2	-10.4	474.2	+79.5
13.3	-19.0	472.4	+69.1
23.0	-10.5	454.1	+50.1
46.8	-20.3	444.3	+39.6
13.6	-0.7	424.0	+19.3
24.0	-8.3	420.3	+18.6
11.1	-1.0	415.0	+10.3
13.9	-2.2	414.0	+9.3
16.8	+1.0	411.8	+7.1
13.7	-3.0	412.8	+8.1
		419.2	+5.1

B is station B of page 45, at entrance to "P.G." passage
AA on a big high rock.

AB on big rock. Stream sinks below boulders.

AC on dirty great big rock.

Stream rises from boulders.

Stream sinks below boulder T.

AT above waterfall.

AK is below hole into Upper Grottoes. Asellus present.

Total = 1912'

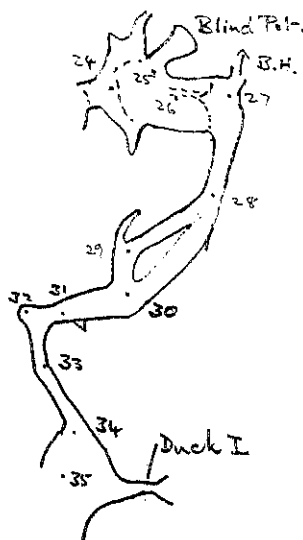
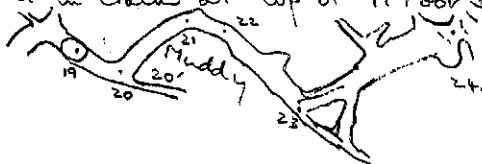
AL is start of St. Paul's survey

AN is at S. end of lower big pot.

AV is in middle of upper big pot.

AY is on stumpy stalagmite on cascade on E side of ^{passage}
Total = 2,122'

18 is in crack at top of 11 Foot Drop.



(25) = A on p. 25
= Big rock by I on p. 40
(top of)

Total = 2662'

SUNDON TOWNSHIP

SFA	HR	DF	DL	NR	FS	SS	Planning	Distance	Fire
(35) - 36								6.0	+90 00
(36) - 37	3	1	4	4		158 00	338 00	29.4	+12 30
(37) - 38	1	3	4	1	011 00		011 00	12.1	-38 00
(38) - 39	1	0.5	1	4		282 00	102 00	30.2	+16 30
(39) - 40	2	2	3	4	063 30		063 30	15.0	+27 00
(40) - 41	2	2	6	2		284 00	104 00	24.4	+13 30
(41) - 42	3	2	2	6	083 00		083 00	19.5	+10 30
(42) - 43	2	0.5	2	1		296 30	116 30	14.8	+14 30
(43) - 44	2	2	2	7	074 30		074 30	49.3	+23 00
(44) - 45	7	3	0	4		337 00	157 00	7.3	+5 00
(45) - 46	7	4	2	0.5	117 00		117 00	16.2	-31 00
(46) - 47	15							35.0	-90 00
(47) - 48	Black Hole	2	7	5	308 00	308 00	128 00	23.6	+8 00
(48) - 49	20	3	4	3	163 30		163 30	27.5	-34 30
(49) - 50	15	0.5	0.5	3		020 00	200 00	23.5	-5 00
(50) - 51	10	2	2	3	186 00		186 00	16.9	-17 30
(51) - 52	3	4	0	4		102 30	282 30	49.5	-20 30
(52) - 53	3	2	5	3	264 00		264 00	51.2	-12 30
(53) - 54	1	1		2	175 00		175 00	14.2	Fail 3.5 feet
(54)									

Nov. 23rd 52

Tock Brookery. Short Dry way + entrance.

(EC) - EB	3	2	2	1		103 00	283 00	12.0	-6 00
(EB) - EA	1	1	8	6	011 00		011 00	3.0	-6 00
(EA) - DZ								6.0	-90 00
(DZ) - DY	5	-	3	2		216 00	036 00	17.5	+8 00
(DY) - DX	3	4	2	1	344 30		344 30	4.9	+6 00
(DX) - DB	15	3	2	2		162 00	342 00	23.5	-12 00
(DB) - DC	2	3		3	259 00		259 00	8.2	-21 00
(DC) - DD	1	3	-	2		119 00	299 00	9.0	-17 00
(DD) - DP	-	3	3	3				0.5	-90 00
(DP) - DO					227 00		227 00	14.8	-53 00
(DO) - DN	12	-		10		261 00	081 00	13.3	-47 00
(DN) - DT								0.5	+90 00
(DT) - DL		6		4	348 30		348 30	14.5	-6 00
(DL) - DK	10	2	4	-		112 00	292 00	17.3	-20 00
(DK) - DJ	8	5	1	2	346 00		346 00	17.2	-22 00
(DJ) - DI	10	7	2	1		138 00	318 00	8.9	-13 30
(DI) - DH	12	7	1	2	304 00		304 00	32.0	-17 00
(DH)									

21st Dec '52

Howard a Tock. Short Dry Way to 40 Pk.

(DH) - DG	20	1	1	3	16 175 00	355 00	5.6	+ 30 00
(DG) - DF	10	5	2	1	317 00	317 00	8.7	+ 2 00
(DF) - DE	15	4	2	1	087 00	267 00	3.1	+ 21 00
(DE) - DD	15	6	1	2	299 00	299 00	13.4	- 15 00
(DD) - DC	16	2.5	2	2	145 30	325 30	19.2	- 2 30
(DC) - DB	6	5	4	1	319 30	319 30	20.1	- 13 00
(DB) - JA	12	3	2	-	089 00	269 00	23.2	- 15 00

August 21st 1951

Cabin

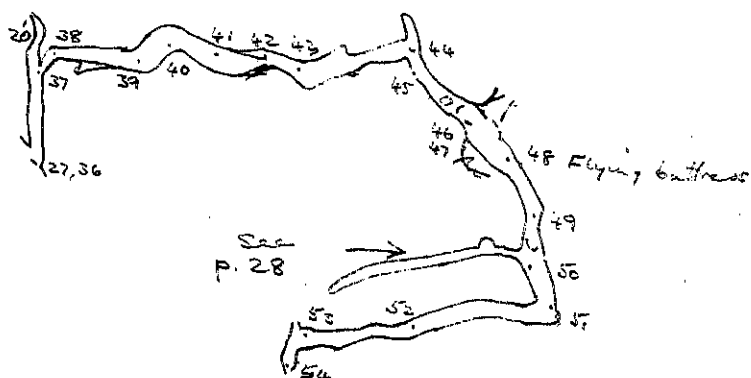
Readings magnetic 1130 W

Name S

ED = 21 of p. 52.

Horiz. & Vert. Dist. - Depth below Surface

—	+6.04545	+50.1
28.6	+6.44608	+56.1
9.5	-7.44672	+62.5
28.9	+8.64598	+53.1
13.4	+6.84684	+63.7
23.7	+5.74715	+70.6
19.2	+3.54807	+76.3
14.3	+3.74846	+79.9
45.4	+19.24883	+83.6
7.3	+0.85077	+103.0
13.8	-8.35088	+103.8
—	-35.05603	+95.6
23.4	+3.34653	+60.6
22.6	-15.64687	+64.0
23.4	-2.74502	+48.5
16.1	-5.14502	+45.9
46.4	-17.34656	+40.9
50.0	-11.14286	+23.9
13.3	-3.54499	+13.2
	+1.7	+10.0



(46) marked by candle 4' beyond tip of Black Hole

"Dry" passage starts 3' back.

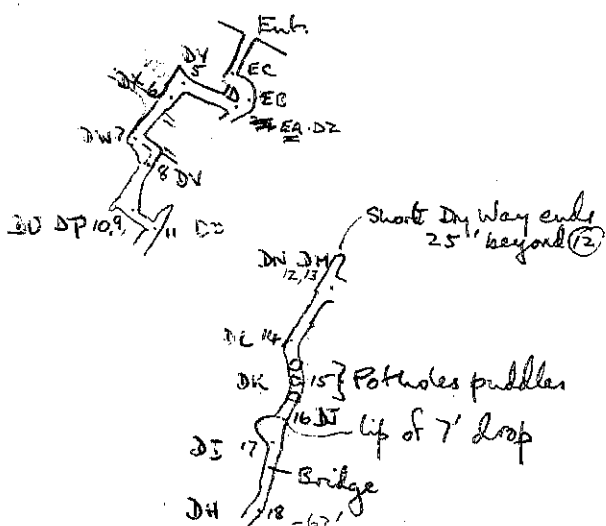
Closed on levels to 1.9 feet. Not bad!

"Dry" passage enters 2' on, on North (53) is marked by a candle 1' below O on roof. (54) is H₂O level in sump

Total = 3,208

11.9	1924.4	-1.37719	+367.1
13.0	1922.5	-0.37715	365.8
—	1899.5	-6.07702	365.5
17.3	1912.5	+2.47642	359.5
4.9	1902.2	+0.57666	361.9
23.0	1897.3	-4.97671	362.4
7.6	1874.3	-3.07622	357.5
8.6	1866.7	-2.67592	354.5
—	1830.1	-0.57556	351.9
8.9	1858.4	-11.87521	351.4
9.0	1849.2	-9.77443	339.6
—	1840.2	+0.57324	329.9
14.4	1840.2	-1.57257	330.4
16.2	1825.8	-5.97326	328.9
15.9	1809.6	-6.47277	323.0
8.6	1793.7	-2.17212	316.6
30.6	1783.1	-9.47192	314.5
1754.5		709.8	305.1

EC is on dimple in projecting rock 10' below entrance on E.



in 2' candle on smoke BM below smoke O

4.9	1754.5	+2.87218	307.1	305.1
8.7	1749.6	+0.37206	308.2	307.9
2.9	1740.9	+0.77209	308.9	308.2
12.9	1738.0	-3.57126	305.4	308.9
19.1	1715.1	-0.87101	304.6	305.4
19.6	1692.0	-4.57012	300.1	304.6
22.4	1676.4	-6.07321	294.1	300.1

Entrance to Old Grotto.

P T O

WHITE SPOT CAVE AND RESERVOIR HOLE

STA	H.R.	DF	WL	WR	FS	BS	Bearing	Dist (Ft.)	Fore Clin.	Hor. Dist.	Vert. Dist.
(A) B	∞	3	4	—	—	322° 00'	142° 00'	24.7	-11° 30'	24.2	-4.9
(B) C	20	2	2 4	4	196 50	—	196 50	27.2	-9 30	26.8	-4.5
(C) D	25	1.5	2.5	3.5	—	013 00	193 00	80.5	-38 00	63.5	-49.6
(D) E	40	2	3.5	2.5	196 10	—	196 10	37.0	+6 00	36.8	+3.8
E	2	3	1	1	—	—	—	—	—	—	—

(F) G	—	—	—	—	—	232 00	—	232 00	54.0	+15 00	52.2	+14.0
(G) G ¹	—	—	—	—	—	160 00	—	240 00	27.0	-40 00	21.4	-17.5
(G) G ²	—	—	—	—	—	066 00	—	246 00	28.2	-15 00	—	—

G²-G³ FS. 241.00 Dist. 48.0 FC. +10.00 G³-G⁴ FS. 306.00 Dist. 46.0 FC. -25.00 G⁴-G⁵ FS. 254.00 Dist. 39.0 FC. 0.00

(H) I	—	1.5	0.5	0.8	—	004 10	184 10	15.0	-16 30	14.4	-4.3
(I) J	0.7	0.7	1.5	2.0	208 30	—	208 30	7.3	-11 00	7.2	-1.4
(J) K	1	—	1	0.5	—	021 30	201 30	24.3	-18 00	23.1	-7.5
(K) L	1.5	1	1.5	1	194 00	—	194 00	16.8	-21 30	15.6	-6.2
(L) M	1	0.4	0.5	1	—	005 00	185 00	17.3	-15 30	16.7	-4.6
(M) N	1	1.5	2	2.5	199 00	—	199 00	41.7	-20 30	39.1	-14.7
(N) O	13	1	3	3	—	018 00	198 00	13.8	+14 00	13.4	+3.3
(O) P	2	3	1.5	1	200 50	—	200 50	36.0	-12 30	35.1	-7.4
(P) →	6	1	1	1	—	Feb 3rd 1952	—	—	—	—	—
(N) Q	13	1	3	3	006 10	—	006 10	24.5	-22 30	22.6	-9.4
(Q) R	15	3	2	—	—	011 00	191 00	4.5	-6 00	4.5	-0.5
(R) S	15	4	—	—	—	293 00	293 00	34.2	-72 00	10.3	-32.5
(S)	—	—	—	—	—	—	—	—	—	—	—

March 3rd, 1952

(DA) -CZ	10	2	—	7	202 20	—	202 20	27.9	-41 30	20.9	-18.5
(CZ) -CY	25	4	3	2	—	069 00	249 00	22.6	-17 00	21.6	-6.6
(CY) -CX	25	2	1	2	292 00	—	292 00	27.4	-6 40	27.2	-3.2
(CX) -CW	25	—	4	2	—	030 00	210 00	22.2	-1 40	22.1	-0.6
(CW) -CV	30	3	3	3	192 00	—	192 00	16.3	+6 30	16.2	+1.8
(CV) -CU	15	5	1	5	—	073 00	253 00	13.6	+6 00	13.5	+1.4
(CU) -CT	8	10	—	12	259 30	—	259 30	20.1	-28 00	17.7	-9.4
(CT) -CS	4	3	1	5	—	—	—	1.8	+90 00	—	+1.8
(CS) -CR	5	5	1	5	321 00	—	321 00	15.8	-1 00	15.7	-0.3
(CR) -CQ	6	5	1	2	—	144 00	324 00	16.7	-5 00	16.6	-1.5
(CQ) -CP	6	5	1	2	325 30	—	325 30	14.5	+3 00	14.4	+0.8
(CP) -CO	4	6	—	2	171 00	—	351 00	4.1	Level	4.1	—
(CO) -CN	4	8	—	2	168 00	—	348 00	9.5	+4 30	9.4	+0.7
(CN) -CM	3	8	1	2	335 00	—	335 00	25.5	-21 30	23.8	-9.3
(CM) -	—	—	—	—	—	—	—	—	—	—	—

Cont'd on P. 63.

Dec 28th 1951

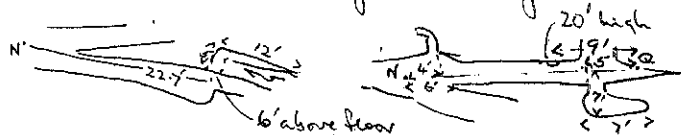
Altitude.

Noises.

(Sta. P. in Cheddar Gorge survey)

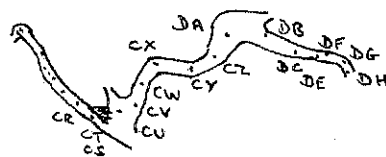
- ~~400.2~~ 400.2 A is at entrance of White Spot, 3' West of old mark & 2' above it.
~~398.8~~ 398.8 C is just (3') beyond rails at head of "drop"
~~395.7~~ 395.7 D is a few feet beyond the lower end of the slope, 25' on the floor
~~349.5~~ 349.5 E is 6' before the end, in a tight fissure. reaches 6' below I.

- 415.1 F is a point 5' from H along continuation Line I - > H.
 429.1 G is at innermost point of recess in cliff.
 411.6 G[#] is beyond a spur of the cliff, a multiple hazel bush.
 G⁵ is on reservoir hence 6' from cliff. Then up to White Spot, with kink at 30' $\frac{6}{30}$ $\frac{15}{15}$ W.S.
 415.1 H is entrance of Reservoir Hole, Sta. N. of Cheddar Gorge Survey, p. 32
 410.8
 409.4 I is far side of first squeeze.
 401.9 K is in chamber with a branch (now filled in)
 395.7 L is just before the last bang area.
 391.1
 376.4 N is a fixed point on the floor of the First Chamber.
 379.7 O is along South Passage.
 372.3 P is at end of final chamber in S. Passage. Crack goes on 6' further.
~~367.7~~ N' is 0.7' above N.



- 367.7 R is 6' above chockstone.
 367.2 S is at bottom of loop.
 334.7
 Very bottom 323.7'

275.6	294.1	698.8
269.0	275.6	680.3
265.8	269.0	672.7
265.2	265.8	670.5
267.0	265.2	669.9
268.4	267.0	671.7
259.0	268.4	675.1
260.8	259.0	683.7
260.5	260.8	685.5
259.0	260.5	685.2
259.8	259.0	681.7
259.8	259.8	684.5
260.5	259.8	684.1
251.2	260.5	685.2
251.2	251.2	655.4



On stalagmite projection over 40 ft pr.

Total = 2700'

Check Goughs Cave survey, Entrance to Black Cat.

STA	F.S.	B.S.	Bearing	F.Cins.	Distance	H. Dist.	V. Dist.	Altitude
① - 2		358° 20'	178° 20'	-8° 15'	48.4'	47.9	-6.9	① = 108.7
② - 3	102° 10'		102 10	-4 10	36.4	36.1	-2.7	② = 105.8
③ - 4		301 30	121 30	-2 30	79.0	78.6	-3.4	③ = 102.4
④ - 5	157 45		157 45	-5 30	19.4	19.2	-1.9	④ = 100.5
⑤ - 6	119 20		119 20	-1 30	59.5	59.3	-1.6	⑤ = 98.9
⑥ - 7		253 00	073 00	+4 10	53.3	52.9	+3.9	⑥ = 102.8
⑦ - 8	083 40		083 40	+5 30	89.3	88.8	+8.6	⑦ = 111.4
⑧ - 9		249 00	069 00	+10 15	73.8	72.5	+13.1	⑧ = 124.5
⑨ - H	201 00		201 00	-5 20	22.4	22.2	-2.1	⑨ = 122.4
⑩ - 10	118 30		118 30	-0 45	162.5	162.4	-2.1	⑩ = 120.3
⑪ - 11		334 40	154 40	+3 30	68.8	68.5	+4.2	⑪ = 124.5
⑫ - 12	106 50		106 50	+26 30	38.2	34.2	+17.0	⑫ = 141.5
⑬ - 13	094 00	276 00	095 00	+13 30	29.3	28.5	+6.8	⑬ = 148.3
⑭ - 14	178 50	004 00 ^{better}	182 30	+35 00	28.8	23.6	+16.5	⑭ = 164.8
⑮ - 15		290 30	110 30	+18 10	35.7	33.9	+11.1	⑮ = 175.9
⑯								

Cheddar Water Levels, Feb 18th 1952.

Main Ring = 4.3' below B.M.	90.3	=	86.0
Ring No 2 = 0.5' " B.M.	87.0	=	86.5
Sages Hole = 3.4' " B.M.	90.0	=	86.6
Skeleton Pit = 8.8' " B.M.	94.2	=	85.4
2 nd Pit = 8.9' " B.M.	97.4	=	88.5
Oxbow Shaft = 16.5' " B.M.	100.9	=	84.4
Far Shaft			

King Solomon Temple — Black Cat — Pilon Shaft.

① - a	161 00	161 00	-5 00	32.1	31.9	-2.8	① = 173.3
② - b			+90 00	49.2		+49.2	② = 170.5
③ - c	138 50	318 50	+18 00	14.6	13.9	+4.5	③ = 219.7
④ - d	208 50	208 50	-31 30	21.6	18.4	-11.3	④ = 224.2
⑤ - e	050 20	230 20	-12 30	22.9	22.4	-4.9	⑤ = 212.9
⑥ - f	247 30	247 30	-20 30	14.5	13.6	-5.1	⑥ = 208.0
⑦ - g	170 30	350 30	+8 00	9.9	9.8	+1.4	⑦ = 202.9
⑧ - h	232 00	232 00	+8 30	24.0	24.0	+3.5	⑧ = 204.3
⑨ - i	289 30	289 30	-12 40	58.9	57.4	-12.9	⑨ = 173.3
⑩ - j	357 10	177 10	+4 20	23.3	23.2	+1.8	⑩ = 160.4
⑪ - k	183 50	183 50	+39 20				⑪ = 162.2
⑫							⑫ =

Phimbury, March 29th 52.

Oxbow Shaft.	Water level	14.3' below B.M.	
	Bottom	28.5' " "	
Far Shaft	Water level	33.3' " "	
Skeleton Pit	Bottom	35.1' below B.M.	

Alt. above Sea Level.

86.6
72.4
87.6

Pool apparently blocked & shallow, or goes off at an angle.

March 2nd 1952.

Notes.

Bearings magnetic, 11°30' W. (calibrated), Compass readings taken with show cave light off.

① is 1' ^{vertically} above C of p. 13.

③ is ± 2' ^{vertically} below mid-centre bar of rails round Skeleton Pit.

⑤ is on the floor 2' vertically below Sta. BP on p. 5; at base of Fouts.

④ = Sta. H of p. 1.

⑩ is just opposite the E. end of Pixie Forest.

⑪ is 6' West of foot of Steps. (32 steps).

⑫ is on top step.

⑬ (5' E. of J) is 3' N of the bottom of 13 steps.

⑮ is on top of big rock; = ② of p. 13.

Checks with ^{my} old survey to within 3'.

March 27th - 28th 1952.

L is on top of big rock, = ② of page 13.

b is on lip of shaft 50' high.

Dip 50° 295', flattening to 20° 20' South.

No obvious scalloping

Enters K.S.T. after 6'.

HR	DF	WL	WR
12	—	10	8
10	2	20	5
1	—	—	2.5
4	1	5	4

L is on top of big rock, = ② of p. 13.

i is in the middle of the topmost of 5 steps.

j is on the top of the Organ pipes in Solomon Temple.

+ Sand Hole = 3,470'

Other measurements:—

Far Rift is 64' high above most Easterly survey point.

Fiat Roof offshoot chimneys, W → E.

1. 88' scalloping down.
2. 45' 3. 60' 4. 50'

Pixie Forest chimneys, W → E.

1. 35' 2. 40' 3. 50' + 4 ?



THE FAIRY CAVE DISTRICT.

STA	H.R.	D.F.	WL	WR	F.S	BS	Bearing	Distance	ForeCling.
① 2						037 00	217 00	37.5	-6 30
② 3					190 00		190 00	50.9	-24 30
③ 4						³⁰ 034 50	124 50	205.9	+1 15
④ 5					084 10		084 10	36.3	+20 45
⑤ 6	5	-	1	6		274 30	094 30	32.5	-22 30
⑥ 7	15	4	4	15	111 30		111 30	21.5	+18 30
⑦ 8	2	3	3	1		278 00	098 00	31.5	-10 00
⑧	3	2	2	3					
① - 9						279 00	099 00	82.2	+12 40
⑨ - 10					085 00		085 00	119.8	+3 20
⑩ - 11						234 00	054 00	56.6	-15 40
⑪ - 12					062 30		062 30	177.2	-6 30
⑫ - 13						241 20	061 20	453.4	-13 20
⑬ - 14					072 00		072 00	67.6	-4 15
⑭ - 15					156 30		156 30	31.2	+8 40
⑮ - 16					092 00		092 00	33.0	-13 30
⑯									

PRIDDY GREEN DIG continued from b. 73

172-173	15 (6)	-	6	158 20	338 20	158 20	5.7	+ 11 30
173-174	3	2.5	2.5	2 (in side riff) 15	311 20	311 20	17.2	-28 30
174-175	1	0	3		101 00	281 00	8.1	-59 30
175-176	1.5	1	3	1	241 00	241 00	12.5	-52 00

168-274					159 30	339 30	28.2	-30 30
274-275	1	1.5			270 35	270 35	15.5	+20 00
275 Δ								

4th Jan '52.

Readings magnetic, variation 11° 30' W.

Hor. Dist. Vert. Dist. Altitude.

Notes.

37.2 - 4.2 129.2

① is the centre of a large branch stump on a beech tree 4' above the ground.

46.2 - 21.1 125.0

205.9 + 4.5 103.9

33.9 + 12.8 108.4

30.0 - 12.4 121.2

20.4 + 6.8 108.8

31.0 - 5.5 115.6

110.1

80.1 + 18.2 129.2

119.3 + 7.0 147.4

54.4 - 15.3 154.4

175.8 - 20.0 139.1

440.2 - 104.4 119.1

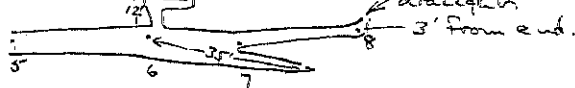
67.0 - 5.0 14.7

30.8 + 4.7 14.4 = ⑬

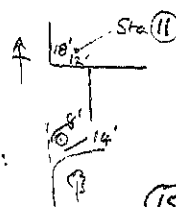
32.0 - 7.7 + 9.7

+ 2.0

⑤ is in the entrance of Fairy Cave Quarry Cave. (Pixie Grotto)



⑨ on edge of quarry.



⑬ is near corner of wall.

⑮ is ent. to 'ole, in roof

⑯ is where big rock rib meets concrete, 2' above water level.

Sept 29th 1960 Fred Davies.

5.6 65.2 + 1.1 712.7

15.1 65.2 - 8.2 712.8

4.1 75.2 - 7.0 707.6

7.7 75.2 - 9.8 700.6

5.4 82.2 - 8.2 820.8

176: HR 0, DF 2.5, WL 3, WR 1.5. 176 is chisel mark →

July 27th 1963

Fred Davies, Bryan Ellis.

Readings magnetic, variation 8° 45' W (cal^d)

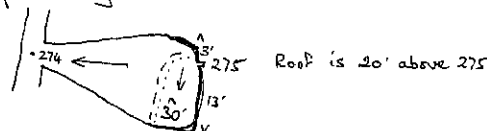
24.3 - 14.3 745.2

168: see p. 73. 274 is in main passage

14.6 + 5.3 730.9

275 is drill mark in wall of aven.

736.2



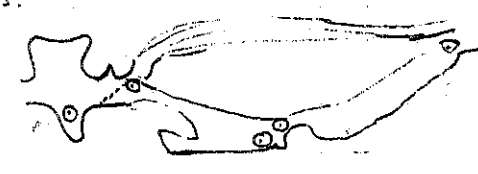
8th Feb. Barnes' Loop to Torby

STA	H.R.	D.F.	W.L. in alcove	W.R. in alcove	F.S.	B.S.	Bearing	Distance	Fore Chino
AY-AZ	20	8	30	10		259 20	079 20	17.6	+ 30 30
AZ-BA	12	6	2	4	113 30		113 30	36.6	+ 21 20
BA-BB	20	8	6	2		179 30	359 30	10.8	- 38 20
BB-BC	12	1	2	6	011 50		011 50	20.4	+ 1 00
BC-BD	18	1	4	3		160 00	340 00	49.6	+ 17 40
BD-BE	25	4	3	6	333 00		333 00	24.7	- 26 00
BE-BF	30	10	-	5		203 30	023 30	13.3	+ 14 00
BF-BG	25	5	5		091 50		091 50	15.7	+ 15 00
BG-BH	25	5	2	5		324 20	144 20	36.9	+ 11 30
BH-BI	5	5	6	2	104 10		104 10	24.2	- 0 30
BI-BJ	25	3	3	10		212 20	032 20	17.5	+ 39 00
BJ-BK	20	15	8	10	121 00		121 00	24.8	+ 9 00
BK-BL	7	6	5	-		277 30	097 30	22.1	- 0 30
BL-BM	30	5	1	3	133 00		133 00	35.7	+ 7 00
BM-BN	20	8	1	3		351 20	171 20	9.9	- 23 30
BN-BO	20	3	4	4	102 20		102 20	7.7	+ 15 00
BO-BP	15	4	3	1		317 00	137 00	21.2	+ 6 50
BP-BQ	25	5	1	3	152 30		152 30	28.5	+ 9 40
BQ-BR	25	7	3	1		313 10	133 10	29.6	+ 1 30
BR-BS	10	3	3	1	137 30		137 30	20.4	- 4 30
BS-BT	6	1	2	3	149 00		149 00	1.5	- one inch
BT-BU	6	1	3	-		265 50	085 50	21.6	+ 14 20
BU-BV	6	3	2	3	116 00		116 00	8.5	- 6 30
BV-BW	9	1	3	1		266 20	086 20	15.7	+ 11 30
BW-BX	12	3	4	3	117 00		117 00	28.5	+ 32 30
BX-BY	20	2.5	8	3		326 00	146 00	6.9	+ 24 30
BY-BZ	18	4.5	3	2	125 20		125 20	13.8	- 4 30
BZ-CA	20	4	-	4		352 00	172 00	18.5	+ 2 15
CA-CB	25	4	6	1	125 00		125 00	8.0	+ 4 00
CB-CC	25	4	10	3		284 10	104 10	17.4	+ 16 00
CC-CD	20	7	3	3	137 10		137 10	74.6	+ 7 10
CD-CE	25	5	4	3		304 00	124 00	35.0	+ 19 00
CE-CF	15	12	6	10	091 40		091 40	28.3	- 13 30
CF-CG	4	4	2	6		294 30	114 30	10.6	+ 16 30
CG-CH	8	6	-	4	014 20		014 20	31.4	- 3 30
CH-CI	12	3	4	-		169 00	349 00	15.9	+ 4 30
CI-CK	10	4	4	6	023 00		023 00	35.2	- 3 50
CJ-CK	10	2	3	-	328 00		328 00	12.3	- one foot
CK-CL		1				272 00	092 00	35.7	+ 71 00
CL-CM					100 00		100 00	3.0	+ two feet
CM									

1st March Trais Grotto into St Pauls System

A-a					048 00		3.4	- one foot
a-b					184 00		19.4	+ 56 30
b-c	20		35	10	229 40		10.8	+ 30 15
c-d	12	2	20	8	203 40		23.8	+ 19 40
d-e	4	2		3	305 10		52.0	+ 2 30

Hor. Dist.	Vert. Dist.	Above S.I.	Notes.
595.15.2	+	8.9518.5+113.8	
612.434.1	+	13.3527.4 122.7	
646.5 8.5	-	6.7540.7 136.0	
655.020.4	+	8.3552.6 129.3	3' before little portal
675.447.3	+	15.0534.4 129.7	
722.722.2	-	10.8560.4 144.7	6' before junction with rift
744.912.9	+	3.2548.6 133.9	Over dark rift
757.815.2	+	4.1561.2 137.1	Corner.
772.036.1	+	7.3565.9 141.2	
809.124.2	-	0.2550.2 148.5	
833.313.6	+	11.0552.0 148.3	W.R. at stream level will
846.924.5	+	3.9534.0 159.3	above lower double pot
871.422.1	-	0.2567.9 163.2	low height due to stalagmite choke in high area
892.535.4	+	4.3567.7 163.0	
926.9 9.1	-	4.0 167.3	
938.0 7.4	+	2.0568.0 163.3	
945.3 21.0	+	2.5550.0 165.3	
966.4 28.1	+	4.8572.5 167.8	
994.529.6	+	0.8572.2 172.6	
1024.120.3	-	1.6578.1 173.4	below boss in Shrine
1044.4 1.5	-	0.1565.1 171.8	bloody horrible
1045.920.9	+	5.4570.1 171.7	
1066.8 8.4	-	1.0581.6 177.1	
1078.215.4	+	3.1590.1 176.1	
1090.624.0	+	15.3583.9 179.2	
1114.6 6.3	+	2.9590.2 194.5	beside hook at top of 20' Drop. W.L. at sta 1'
1120.913.7	-	1.1602.1 197.4	
1122.6 18.4	+	0.7601.0 196.3	
1152.0 7.9	+	0.6601.0 197.0	W.L. at sta 1'
1160.916.8	+	4.8602.1 197.6	
1177.7 73.9	+	9.3650.1 202.4	
1251.6 33.1	+	11.4650.3 211.7	
1284.5 27.5	-	6.662.8 223.1	
1312.2 10.1	+	3.062.2 216.5	
1322.3 31.3	-	1.9629.2 219.5	
1353.6 15.8	+	1.2620.2 217.6	
1367.4 35.1	-	2.4623.5 218.8	
1404.5 12.2	-	1.0621.1 216.4	side of pot at entrance of passage
1416.7 11.6	+	33.8120.1 215.4	side of pot
1428.3 2.5	+	2.0653.0 249.2	tip of pot
1430.8		6859 251.2	see p. 535.



See p. 51 Below Traps Rotten

Top of pit
Foot of cascade



Phil, Don, Oliver, Colin.		
- 3.2	-	1.0 461.2+56.5
- 10.7	+	16.2 481.2+55.5
- 9.3	+	5.4 482.2+71.7
10.0 22.4	+	8.0 491.2+77.1
32.4 57.9	+	2.3 489.8+85.1
84.3		412.1+87.4

Mag
11° 30' W.

Sta	H.R.	D.F.	N.L.	W.R.	F.S.	B.S.	Bearing	Dist.	From Chain
① - f	2	2	3	1.5	125 00	125 00		23.5	+ 8 45
② - g	1.5	0.5	-	1.5	342 00	342 00		16.9	- 5 00
③ - h	1	1	2	1		013 00		7.6	+ 0.5 Feet
④ - i	0.5	0.5	3	1		002 00		18.2	+ 5 30
⑤ - j	2	0.5	1	1.5		007 00		7.8	- 7 00
⑥ - k	2	2	3	2	194 00			28.9	- 17 30
⑦ - l	3	0.5	3	4		027 30		22.3	+ 4 00
⑧ - m	4	3	5	3	187 00			22.9	+ 0 40
⑨ - n	2	1.5	-	2		044 00		18.8	- 5 30
⑩ - o	3	6	3	3	251 00			47.1	- 11 30
⑪		6						32.0	

4th March 1953. Damascus. Howard.

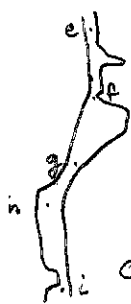
o - p	3	5	4	11		102 00		24.0	- 9 15
p - q	15	2	25 in passage 15	7	250 00			34.4	- 14 30
q - r	4	1	3		320 00			23.1	- 3.5 Feet
q - s						330 00		21.6	+ 20 30
s - t	2	3	25	5	246 00			17.4	- 7 30
t - u	2	1		10	255 00			18.2	- 4 Feet
t - v						346 00		17.3	+ 20 30
v - w	1	1.5	3	3	165 40			16.2	- 2 45
w - x	3	-	4	2		272 30		17.8	+ 19 40
x - y	1	2	2	3	147 00			24.3	+ 10 00
y - z	1		4	-				6.0	- 90 00
z - aa		-	1	2		327 00		12.5	- 42 40
aa - ab	4	4	4	2	212 30			11.2	- 22 30
ab - ac	5 in even	-	2.5	2.5		353 00		8.0	+ 11 30
ac - ad	3	3	4	2	202 00			14.3	- 12 00
ad - ae	4	-	2	3		026 00		12.7	+ 6 00
ae - af	7	2	5	2	263 00			30.5	- 8 40
af - ag	5	1	1.5	4		112 15		27.4	+ 0 15
ag - ah	2	1.5	8	2.5	253 30			13.7	- 20 20
z - ai						322 00		19.2	+ 22 00
ai - aj					097 00			7.2	+ 55 00
aj - ak					099 00			19.7	+ 18 00
ak - al					106 00			9.2	- 22 00
al - am					101 00			15.8	+ 2 Feet
am - an					080 00			12.3	+ 22 00
an - ao					114 00			14.5	+ 50 00
ao - ap					103 00			17.8	- 6 30
ap - aq					026 00			7.7	- 53 00
aq - ar					003 00			8.5	level
ar - as					022 00			10.8	level
as - at					003 00			18.4	- 2.5 Feet
at - au					355 00			11.0	up & down 2'

St Pauls Passage Total 800

522.7 + 220 passage
= 742

How Elev.	Left Elev.	Alt, Sump E.
84.2	23.3	+ 3.6422 87.4
107.6	16.8	- 1.5457 91.0
124.4	7.5	+ 0.5422 89.5
131.9	18.0	+ 1.7477 90.0
149.9	7.7	- 0.9492 91.7
157.6	27.5	- 8.7425 90.8
185.1	22.1	+ 1.6426 82.1
207.2	22.9	+ 0.3424 83.7
230.1	18.6	- 1.8487 84.0
248.7	46.2	- 9.4462 82.2
296.9		52.5 72.8
23.8	-	3.9475 68.9 72.8
33.2	-	8.6476 60.3 68.9
22.5	-	3.5480 56.8 60.3
20.2	+	7.6 ^{46.2} (r=56.8)
17.2	-	2.3426 67.9
17.8	-	4.0422 65.6
16.2	+	6.0 ^{48.6} (u=61.6)
16.1	-	0.8423 71.6
16.8	+	6.0425 70.8
23.9	+	4.2422 76.8
-	-	6.0487 81.0
12.4	-	0.6427 75.0
10.3	-	4.3421 74.4
7.8	+	1.6428 70.1
14.0	-	3.0426 71.7
12.6	+	1.3424 68.7
30.1	-	4.6427 70.0
27.4	-	4.0421 65.4
12.8	-	4.8423 65.4
17.8	+	7.2 (ch=60.6)
4.1	+	5.9422 82.2
18.8	+	6.1422 88.1
8.5	-	3.4422 94.2
15.5	+	2.0425 90.8
11.4	+	4.6422 92.8
9.3	+	11.1522 97.4
17.6	-	2.0422 108.5
4.6	-	6.1511 106.5
8.5	-	5.5 100.4
10.8	-	5.5 100.4
18.1	-	2.5555 100.4
10.6	-	5.2 97.9
		52.6 97.9
		49.76
		Sump = 88.9

Notes.

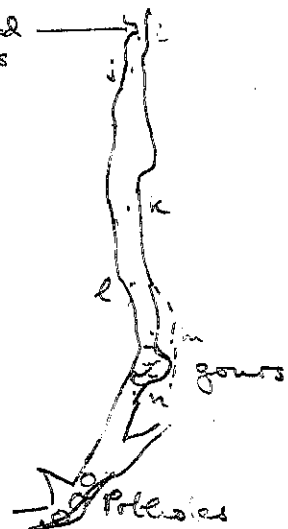


Come
on
White!!

On Oliver's boulder

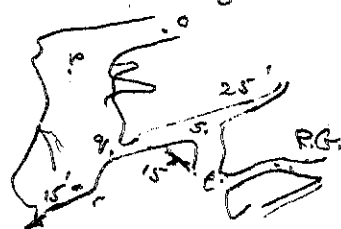
Total = 5,123

blasted
boulders



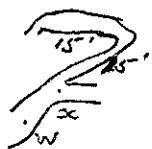
Polesies

Sump 15' on at 280° WL 5 WR 4



Howards Loop.

r in a cross rift 4' from Gate



Bottom of loop. View into Damascus.

Above pool

Bearing ~~238~~ 238 into Howards Loop



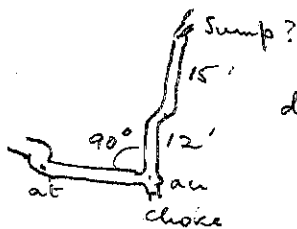
15' athen explored by Oliver just before station



6" above water Sump level 60.1

Fault.

Near side of duck } dry weather.
far side of duck }



descends at 15 or 20 degrees.
ie - 9 feet vertical.

Total = 5,870

PRETTY WAY

May 2nd

1953

STA	HR	DF	WL	WR	FS	BS	Bearing	Dist	Fore Chino
DO-FA	9	1	4			171 30	351 30	17.5	- 0 30
FA-FB	8	2.5	5	2	358 10		358 10	4.8	- 18 30
FB-FC	6	0.3	4	0.3		144 10	324 10	9.8	+ 29 30
FC-FD	3	2	1	1	358 00		358 00	13.3	+ 1 30
FD-FE	4.5	1	2.5	0.3		188 00	008 00	8.9	+ 13 30
FE-FF	2	1	7			232 10	052 10	13.4	+ 13 30
FF-FG	2	5	3	6	026 00		026 00	8.7	- 22 30
FG-FH	3	2	1.5			310 00	130 00	21.3	+ 13 00
FH-FI	5	1	6	6	155 30		155 30	12.8	+ 10 30
FI-FJ	1	1.5	3			240 00	060 00	14.1	- 44 00
FJ-FK	2	2		3	324 00		324 00	35.8	- 18 30
FK-FL	3	4.5		13		238 00	058 00	11.2	- 15 00
FL-FM	12	2	10	3	287 10		287 10	44.5	- 11 00
FM-FN	8	10	3	1		112 15	292 15	14.3	+ 18 30
FN-FO	3	1.5	3	1	340 30		340 30	16.0	+ 4 00
FO-FP	2	12	6	2		068 00	248 00	15.4	- 58 00
FP-FQ	15	6	3	2	319 00		319 00	12.0	- 11 00
FQ-FR	18	5		5		088 00	268 00	39.0	- 6 30
FR-DA	6	under 10 bridge	4	10	252 30		252 00	29.2	- 24 30
DA									
FK-FS						271 40	091 40	31.3	+ 11 00
FS-FT	10	4	6	7	162 00		162 00	38.1	+ 17 00
FT-FU	3	0.5	3.5	3.5	008 00		008	18.4	+ 7 Feet
FU-FV	1	3	10	2	046		046	13.3	+ 5 Feet
FV-FW	2	2	10	10	075		075	20.2	+ 3 Feet
FW	4	1	4	12					

SURFACE TIE - UP

EC-ED					346 00	166 00	9.8	+ 45 15
ED-EE					042 00	222 00	38.1	+ 19 00
EE-EF					190 30	190 30	63.3	+ 12 40
EE-EG					229 40	229 40	57.3	+ 10 00
EE-EH					328 00	328 00	190.3	+ 8 00
E+H								

WET WAY

Oliver (+Richard)

FB-FX					035 00	215 00	15.6	+ 22 00
FX-FY	2	3	1	3	173 00	173 00	15.1	- 33 30
FY-FZ	10	0.2			079 00	259 00	16.4	- 25 00
FZ-GA	1.7	0.3	0.3	2.5	024 30	204 30	10.0	- 3 00
GA-GR	1	3	4	2	229 10	229 10	11.5	- 12 15
GR								
GA-GB					162 00	162 00	21.6	+ 7 40
GB-GC	0.5	3	5	0.6 bow	267 00	087 00	17.8	+ 19 00
GC-GD	1	4	3	3	113 00	113 00	16.1	+ 18 30
GD-GE	1.1	3	2	4	324 30	144 30	15.5	+ 15 30
GE-GF	1	2	20		193 00	193 00	9.3	+ 29 30
GF-GG	3	4.5	0.2	20	156 30	336 30	26.5	+ 18 00

Other
for dist. Verb Dist. Alt/symp I.

A diagram of a horizontal pipe with a vertical crack. The crack is located 10' from the left end and 15' from the bottom. The pipe has a total length of 33' and a diameter of 10'.

Passage splits
at 34'


"DA" less

450

796.6

5.4
791-2
~~SECRET~~

Total = 6,448'



A hand-drawn diagram of a tree structure. The root node is labeled 'EF'. It has two children: 'EG' on the right and 'EE' on the left. The node 'EE' has a single child labeled 'EH'.

See p. 67 above.

Sketch map of the study area showing the location of the study site (p. 67) relative to the river and the study site (p. 67). The map shows a river with a bend, and a study site (p. 67) is located on the left bank. The river is labeled 'GC' and 'GB'. The study site is labeled 'p. 67' and 'at 282'. The river is labeled 'GC' and 'GB'. The study site is labeled 'p. 67' and 'at 282'.

SWILDONS HOLE

Sta	HR	DF	WL	WR	FS	BS	Bearing	Dist	Chino
GG-EA	3	3	20	7	093 30		093 30	16.2	+25 30
EA									
CS-GH					111 00		111 00	26.5	+24 00
GH-GI	7	4	6	12		316 30	136 30	20.0	+ 3 30
GI-GJ	10	3	8		088 30		088 30	52.9	+ 9 30
GJ-GK	14	4	4	-	108 00		108 00	4.0	-53 30
GK-GL	4	0.5	2.5	0.3		246 30	066 00	11.7	+26 00
GL-GM	10	2	2	3	079 30		079 00	15.8	+26 00
GM-GN	6	2	1			335 30	175 30	12.8	+26 00
GN-GO	10	4	0.5	6	148 00		148 00	39.9	+24 30
GO-GP	1	0.2	4	3		273 30	093 00	8.9	+20 00
GP-GQ	1	3	3	7	121 10		121 10	27.7	+15 00
GQ-GR	2	2	3.5	1	092 30		092 30	9.8	+19 30
GR	1	2	1.7	0.5					

August

Sta	HR	DF	WL	WR	FS	BS	Bearing	Dist	Chino
46-60						195 00	015 00	34.3	+13 00
60-61	10	8	2	8	133 30		133 30	41.8	+ 3 30
61-62	8	6	-	3		192 30	012 30	22.9	+ 6 00
62-63	5	7	3	1	357 00		357 00	30.3	- 5 00
63-64	8	2		2		203 00	023 00	12.5	+12 30
64-65	12	4	3	-		165 00	345 00	15.7	+ 3 30
65-66	3 and 12	3	2	2	006 30		006 30	19.3	+13 30
66-67	6	4	3	4		180 00	000 00	30.2	- 1 00
67-68	3	2	6	4	348 00		348 00	48.9	- 4 00
68-69	3	3	1	-		221 30	041 30	14.8	+ 5 30
69-70	6	3	3	3	005 00		005 00	21.0	- 6 30
70-71	3	1	3			283 00	103 00	36.8	+ 4 30
71-72	4	3	1 to corner	5	019 00		019 00	38.2	+ 5 00
72-73	8	4	3	-		172 00	352 00	11.9	-10 00
73-74	15	2	3	2	007 00		007 00	34.2	- 1 30
74-75	4	-	3	1 to corner		280 00	100 00	9.1	Level
75-76	4	-	1	2		310 00	130 00	40.7	+6 30
76-77	10	2	1	2	161 00		161 00	17.5	- 1 30
77-78	2	-	2	2		338 00	158 00	7.6	+25 30
78-79	10	3	3	4	176 00		176 00	35.0	+ 4 00
79-80	10	3	4	4		325 00	145 00	45.7	+ 0 30
80-81	10	3	5	2	157 30		157 30	27.2	+ 0 30
81-82	5	-	7	8		283 30	103 30	19.1	+ 7 00
82-83	2	2	8	6	140 00		140 00	39.7	+ 3 00
83-84	3	1	5	5		319 00	139 00	35.5	+ 5 30
84-85	1	3	6	3	074 00		074 00	29.1	+16 00
85-86	3	6 to foot of slope	5			193 00	013 00	25.3	+21 00
86-87	3	2	7	3	353 00		353 00	23.1	+18 30
87-88	15	6	15	10 to corner		268 00	088 00	51.3	+12 30
88-89	22	3	4	5	061 00		061 00	16.5	+22 30
89-90	24	6	1	4		211 00	031 50	26.4	+14 30

Sta	HR	DF	WL	WR	FS	BS	E	D	C
90-91	15	4	3	3	351 00		351 00	49.0	+3 30
91-92	25	3	-?	5		215 00	035 00	35.8	+26 30
92-93	20	rocks 4	8	6	018 00		018 00	48.2	+8 30
93-94	8	7	5	2		211 00	031 00	18.5	-9 00
94-95	stalagmite 5	3	3	1	003 00		003 00	26.0	-4 30
95-96	end (8)	-	-	3					
96-97									

APRIL 21st - 22nd 1957

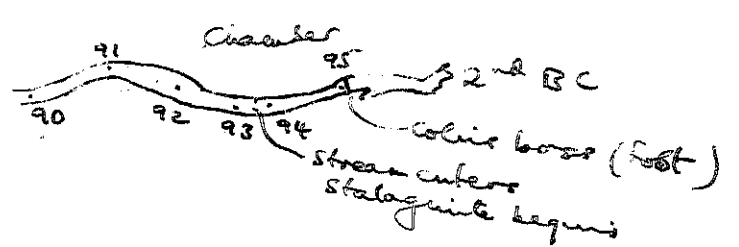
Paradise Required, Mud

ag-98	2	1.5				324 00	144 00	3.3	+23 00
98-99					262 45		262 45	19.5	-19 30
99-100	1.0	0.3	1.8	3.0	262 00		262 00	7.3	+0.2 feet
100-101	3.0	0.3	3.5	1.2		033 20	213 20	10.5	+38 20
101-102	3	1	in passage 14	4	185 10		185 10	15.5	-7 00
102-103	in aven 15	1	2	to aven 7		323 20	143 20	28.9	+20 30
103-104	in double passage 20	6	1	3	161 30		161 30	7.5	-12 30
104-105	20	3	1	in fault 6		296 40	116 40	6.7	+10 30
105-106	20	2	2	1.5	139 40		139 40	20.2	+8 30
106-107	18	2	2.5	6		115 00	295 00	3.3	+6 00
107-108					155 00		155 00	15.0	-8 50
108-109	3	1.5	1.5			056 40	236 40	40.2	+7 30
109-110	18	10	6	1.5	247 00		247 00	20.4	-24 30
110-111	18	0.5	Drop	5		068 30	248 30	26.0	+20 30
111-112	2	2	2.5	2	259 30		259 30	31.5	-14 40
112-113	2	0.3	8	3.5	231 00		231 00	13.9	-12 30
113-114	2	0.5	0.5	4		110 00	290 00	17.7	+49 00
114-115	2.5	4	0.5	1	312 00		312 00	7.6	+1 00
115-116	2	0.3	2.5	1		076 00	256 00	9.9	-14 30
116-117	2	12.9	2			124 40	304 40	19.8	-3 00 candle 1.1 below tripod
117-118	2.5	7	1	0.5	294 30		294 30	18.1	-11 10
118-119	7	1	1.5	4		134 00	314 00	4.3	+41 00
119-120	5	4	4	6	254 00		254 00	6.2	-23 30
120-121	0.5	1	0.5	2	222 00		222 00	9.2	2200
121-122	1.5	0.5	1.5	2		011 50	191 50	10.0	+24 00
122-123	2	1	2.5	1.5	252 30		252 30	22.0	-10 00
123-124	2	0.3	2	1.5		031 00	211 00	18.7	+16 00
124-125	1.5	1.2	4	2.5	281 00		281 00	40.7	-14 15
125-126	2	0.3	3	6		147 15	327 15	13.8	+5 30
126-127	2.5	1.5		4	266 20		266 20	20.5	-9 15
127-128	1.5	0.2	3	1		146 00	326 00	4.3	+17 00
128-129	3.5	1	to choke 12	2.5	021 30		021 30	10.3	+8 20
129-130	3.5	2		6		113 10	293 10	43.2	-10 20
130-131	1.5	1.0	5	3	293 40		293 40	37.8	-3 00
131-132	2	0.5	3	4		167 00	347 00	9.3	+20 30
132-133	1	1.5	10	4	271 30		271 30	14.6	-11 30
133-134	10	0.3	3	1.5		161 00	341 00	14.7	+20 40
134-135	15	3	3.5	1.5	009 30		009 30	21.5	-6 20

1000000
 1000000
 1000000

Notes

H.	V.	A/S.I.		
848.7	48.7	+3.0	178.9	583.6
897.4	32.0	+16.0	181.9	583.6
927.4	47.7	+7.1	197.9	602.6
977.1	18.3	-2.9	205.0	609.7
995.4	25.8	-2.0	202.1	607.7
1021.2	52.5	+10.0	200.1	607.7
1072.7			200.0	615.0



Sump to Blue Pencil Passage. Chris Hawkes. May 10° 35' W.

	3.0	+1.3	65.4	470.1
102	18.4	-6.5		471.4
103	7.3	+0.2		464.9
104	8.2	+6.5		465.1
105	15.4	-1.9		471.6
106	27.0	+10.1		469.7
107	7.3	-1.6		479.8
108	6.6	+1.2		478.2
109	20.0	+3.0		479.4
110	3.3	+0.3		482.4
111	14.8	-2.3		482.7
112	39.9	+5.3		480.4
113	18.5	-8.5		485.7
114	24.3	+9.1		477.2
115	30.5	-8.0		486.3
116	13.6	-3.0		478.3
117	11.6	+13.4		475.3
118	7.6	+0.1		488.7
119	9.6	-2.5		488.8
120	19.7	-2.1		486.3
121	17.8	-3.5		484.2
122	3.2	+2.8		480.7
123	5.7	-2.5		483.5
124	9.2			481.0
125	9.1	+4.1		481.0
126	21.7	-3.8		485.1
127	18.0	+5.3		481.3
128	39.4	-10.0		486.6
129	13.7	+1.3		476.6
130	20.3	-3.3		477.9
131	4.1	+1.3		474.6
132	10.2	+1.5		485.9
133	42.5	-7.7		477.4
134	37.6	-2.0		469.7
135	8.7	+3.3		467.7
136	14.3	-2.9		471.0
137	13.8	+5.2		468.1
138	21.3	-2.4		473.3
139				470.9

Near side of pool in Mud sump
 Far " " " " " "

Foot of Mud Shute

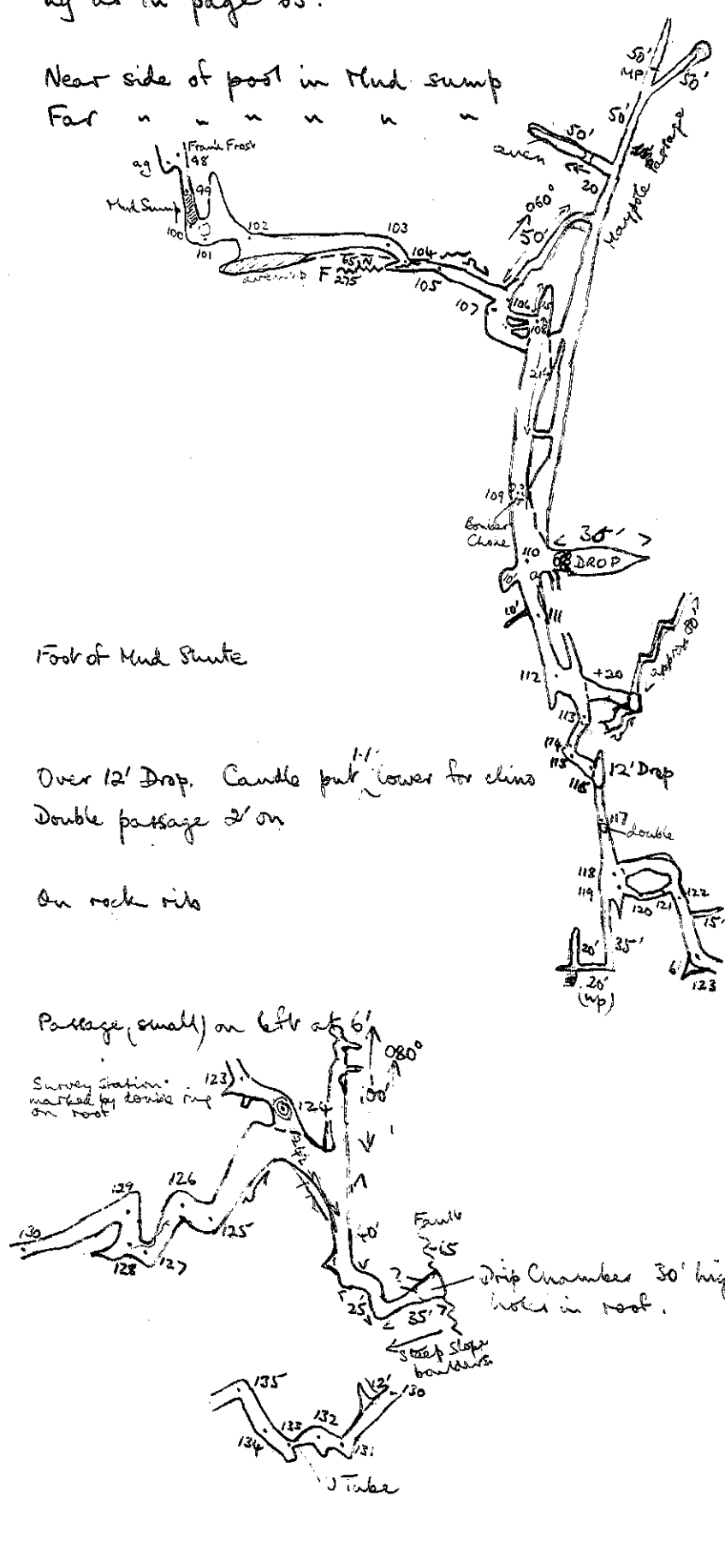
Over 12' Drop. Candle put lower for chins
 Double passage 2' on

On rock ribs

Passage (small) on left at 6'

Survey station marked by double ring on rock

Drip Chamber 30' high hole in roof.



STA	HR	DF	WL	WR	FS	BS	Bear	D	C
135-136	3.5	1.2		3		084 20	264 20	57.2	-13 40
136-137	2	1	6		007 36		007 30	18.4	-6 00
137-138	5.5	0.3	5			252 15	072 15	24.8	+33 20
138-139	2.5	1.5	4	1	052 00		052 00	19.0	+16 30
139-140	0.8	0.3	5	2		094 10	274 10	35.0	-19 20
140-141	10	1.5	4	5	265 50		265 50	51.6	-19 00
141-142	2.5	2	15	3		149 15	329 15	21.6	+11 00
142-143	3	1.5	11		042 20		042 20	22.4	+28.30
143	0	3.5							

Knob on roof 4 feet from entrance pit of Blue Pencil

Tie-up with Pridly Green Dig. May 17 1960 Angela

ED-144				041 00	221 00	36.3	+20 20
144-145			276 00		276 00	59.2	+10 30
145-146				070 50	250 50	53.6	-4 00
146-147			252 00		252 00	390.9	-0 30
147-148				086 00	266 00	58.7	-2 40
148-149			269 00	089 00	269 00	292.7	-0 35
149-150			244 30	064 00	244 00	86.1	-1 50
150-151			254 00	074 00	254 00	385.8	-0 30
151-152			236 00	056 00	236 00	120.4	-1 20
152-153			255 30	074 40	255 15	44.8	-9 40
153-154			046 00	226 00	046 00	70.2	+7 20
154-155			070 40	251 40	071 00	96.8	+1 30
155-156			089 40	269 00	089 30	73.9	+0 30
156-157			068 00	248 00	068 00	403.0	-0 20
157-158			088 00	267 40	088 00	66.7	-1 50
158-159			088 00	269 00	088 15	283.5	+1 00
159-160			072 40	252 40	072 40	96.2	-0 40
160-161			072 00	252 00	072 00	347.3	+0 50
161-162			091 50	272 20	092 20	63.8	-10 30
162-ED			041 30	220 00	041 00	31.9	-21 20

163-164				257 00	257 00	8.0	-70 00
164-165				337 00	337 00	8.2	-33 30
165-166				126 00	126 00	7.2	-34 30
166-167				078 00	078 00	4.8	-13 00
167-168				337 00	337 00	8.8	-32 00
168-169						5.5	+30 00

Pridly Green Dig, Sept 10th 1960 Jim Hamwell

168-169	0	2	07	1	161 00	341 00	24.6	-32 30
169-170	1	15	15	2	342 45	342 45	16.7	-31 00
170-171	2.5	2.5	07	0	195 00	015 00	9.0	-18 00
171-172	1.5	2.0	10	10	344 30	344 30	11.0	-32 30

A hand-drawn map of a stream bed, showing a winding path with numerous measurements in feet. The map includes the following labels and measurements:

- Top Left:** "Note" with a horizontal line.
- Top Center:** "i cloche" with a measurement of "15'".
- Top Right:** "15' avenue".
- Left Side:** "Pine Bend" with an arrow pointing to a bend in the stream.
- Bottom Left:** "Sound of stream" with an arrow pointing to a small pool or bend.
- Measurements along the path:**
 - 10' (near top left)
 - 25' (near top center)
 - 30' (near top center)
 - 355' (near top center)
 - 140' (near top center)
 - 143' (near top center)
 - 139' (near top right)
 - 138' (near top right)
 - 135' (near top right)
 - 137' (near top right)
 - 136' (near top right)
 - 142' (near bottom center)
 - 141' (near bottom center)
 - 20' (near bottom center)
 - 15' pit (near bottom center)

Marked by arrows.

- 153

~~779.3 + 6.4153~~

12.8' + 12.8 Vert Error 12.8' in 3,050' = 0.43% error. O.K.

780-1 [unclear] [unclear] [unclear] [unclear] [unclear]

7646 *Stem. fr. - small*

759-8

752-2

740.0

744.7

-45.2

745.2

732-0

723.4

720.6

used

(continued on p. 59.)

Lip of loop into Great Chamber. ^{mouth on overhanging ledge in bill} 172 is cankle & pinke ~~to~~

Side Passages in Paradise Regained May 22 1960

STA	HR	DF	WL	WR	FS	BS	Rear	Dist	Clino
143-201	0	3	3	6		165 30	325 30	38.4	+18.30
201-202	3	2	6 to mousehole		061 30			35.7	+23 00
202-203	3	2	4	0		142 00		16.8	-3 30
203-204	3	4		5	248 00			10.8	-20 30
204	2	1						10.7	-20 30
124-205	0	3	2	2		054 30		28.2	-17 30
205-206	2.5	1	3	3	091 00			54.7	+14 00
206-207	2.5	0.5	4	Passage 20' at 127°		247 00		43.6	+14 ? (estimate)
205-208			3	3	263 00			39.7	-16 00
208-209	2.5	2	1	4' to dig		076 00		16.7	-11 30
209-210								2.6	+90 00
210-211	5	3	3	3		041 00		36.3	+25 00
211-212	12	4	2	2	175 00		175 00	26.8	+34 30
212 up Oliver's hole	4				020			90?	+50

325 = 363 SW 10, 22 2

Side Passages in Paradise Regained - Maypole Series

113-213						243 00	063 00	27.5	+15.30
213-214						079 00	079 00	18.3	+9.0
214-215						245 30	065 30	13.0	-25.30
215-216						076 30	076 30	61.4	+29.30
216-217	10	3(30)	4	3		251.40	071 40	13.3	+1.30
217-218	3	1	2	2	048 30		048 30	18.3	+13.30
218-219	3	4	1	3		254 00	074 00	22.0	+13.00
219-220	5	3	1	1	104 30		104 30	32.3	-22.30
220-221	20	2		1		294 00	114 00	19.7	+20.00
221-222	20	5		3	162 30		162 30	20.2	+42.00
222-223	10	4	4	3		274 00	094 00	32.7	+23.30
223-choke	2	1.5	2	1	047		047	10	gravel choke

221-224					089 00		089 00	20.7	+51.00
224-225	15	over 11' drop	3	-		244 30	064 30	17.5	+37.30
225-226	5	6	2	2	104 40		104 40	36.3	+13.00
226	-	4	2	1.5					Dig 10' on at 040, choke 10' further

Side Passages in Paradise Regained - Maypole Series

220-227	20	2				208 00	028 00	12.3	-6.00
227-228	4	2.5	2	1	006 30		006 30	31.3	-42.00
228	20	-	3.5	1					Passage continues 15' at 350° Corner of Airless
113-229						276 30	096 30	8.5	+38.00
229-230	4	1.5	7	3	189 15		189 15	33.6	+46.30
230-231	6		8			131 30	311 30	9.3	+14.00
231-232	3	2	1.5	2.5	267 00		267 00	18.8	-15.00
232	1	-	0.5	2.5					Choke 1' on in same line
230-233			4	4.5		258	078	9.4	+26.00
233-234	1	2.5	1	1	098		098	37.5	+17.30

Howard, Chris Hawther, Derek Ford Reading mag. $40^\circ W$

H V OD.

Notes

226 36.4 +12.2 460.9 143 - see p. 73

872 32.2 +13.9 473.1

205 16.7 -1.0 487.0

921 10.1 -3.8 486.0

931 482.2

204 is a knob low on wall, circle & dot on roof above

26.9 -8.5 488.1 124 is 1.5' above 124 of p. 71

33.5 +13.2 479.6

22.5? +10.6? 492.8 207 marked on roof, at 503.6

36.1 -10.9 479.6

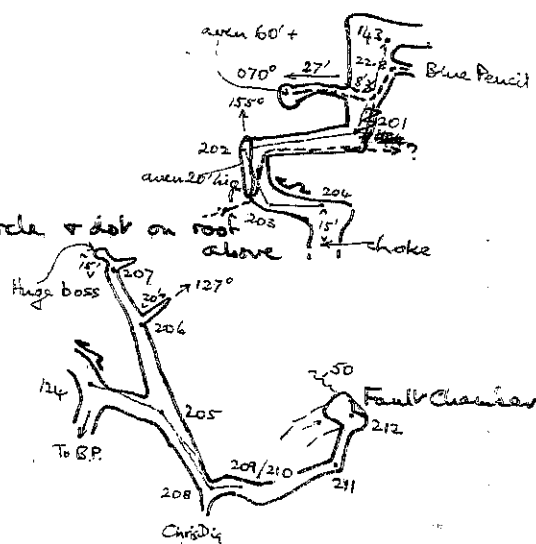
16.4 -3.3 468.7

2.1 +2.6 465.9

32.1 +15.3 467.0 Kennys Belly!

22.1 +15.2 482.3

+ 497.5 212 marked by arrow on dipstone wall in Fault Ch.



July 12th 1960. Derek Ford. Var $11^\circ W$

26.5 +7.3 475.3

26 18.1 +2.9 482.6

30 11.7 -5.6 485.5

53.6 +30.3 479.9 215 marked ... in Pitch Chamber. Maypole Series starts about 30' along, between 2 holes in floor.

13.8 +0.3 510.2

17.8 +4.3 510.5 Hole in floor 6' on, 4' diam

21.4 +4.9 514.8 Highish rift

29.8 -12.4 519.7 Oxbow on left at 12'

18.5 +6.7 507.3 Passage on left.

15.0 +13.5 514.6 Maypole Junction

30.0 +13.0 527.5

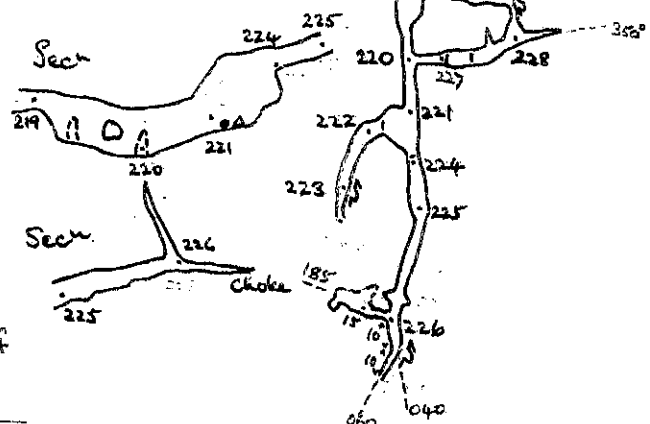
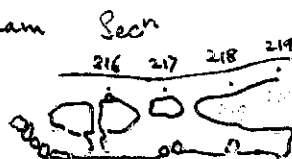
W 540.5 ... on roof

13.0 +16.0 514.0 Maypole Junction

13.9 +10.6 520.0

35.4 +8.2 540.6 cross joints at 27' & 34'

at 060 548.8 smoke mark .V. on roof also candle + mud



Candys Calamity, Shatter Pot. July 14th 1960. Joe Candy. Var $11^\circ W$

12.2 -1.3 507.3

23.2 -20.9 506.0 Lip of 8' drop

Oxbow 18' at 307°. Bottom of A.O. 3' lower than 228

6.7 +5.2 475.2 Bottom of Greasy Chimney

23.1 +24.5 480.5

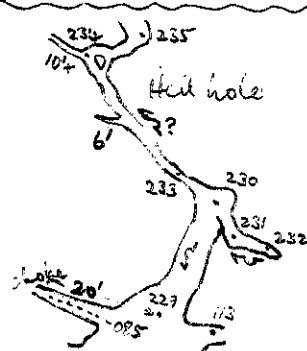
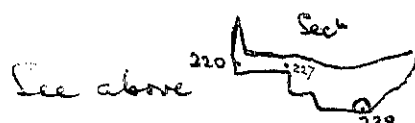
9.0 +2.2 505.0

18.2 -4.9 507.2

1502.3

8.4 +4.1 505.0

35.8 +11.2 509.1 6' passage on left at 15'



P.T.O.

EBBOR GORGE LEVELLING, contd.

Upper tributary valley.

STA	F.S.	B.S.	mean	Dist	Hor dist	Vert Dist	Ht. Sta.	Alt. Elev.	Notes.
(60) - a.	+9 00	-9 00	+9 00	100	100	+15.6	1	673.7	at valley junction
(a)	+12 10	-12 15	+12 10	50	150	+10.5	-	690.3	
(b)	+15 00	-14 20	+14 40	50	200	+12.7	-	700.8	
(c)	+16 20	-16 15	+16 20	50	250	+14.0	-	713.5	
(d)	+7 30	-7 40	+7 35	100	350	+13.2	2	725.5	by fence or wood
(e)	+4 30	-4 25	+4 30	100	450	+7.8	1	739.7	
(f)	+2 10	-2 20	+2 15	100	550	+3.9	-	748.5	
(g)	+2 30	-2 45	+2 35	100	650	+4.5	-	752.4	
(h)	+1 45	-2 10	+2 00	100	750	+3.5	-	756.9	Valley well defined,
(i)	+3 00	-3 10	+3 05	100	850	+5.4	-	760.4	20' deep
(j)	+4 00	-4 05	+4 00	100	950	+7.0	-	765.8	
(k)	-1 15	+1 10	-1 10	100	1050	-2.0	4	768.8	On wall
(l)	+1 30	-1 35	+1 30	100	1150	+2.6	-	770.8	
(m)	+4 20	-4 15	+4 15	100	1250	+7.4	-	773.4	
(n)	-1 45	+1 30	-1 40	100	1350	-2.9	3	777.9	below Vert. error 1' too low
(o)	+0 45	-1 00	+0 50	100	1450	+1.4	-	777.9	below BM. 781.0
(p)	+0 35	-0 50	+0 45	100	1550	+1.3	-	779.3	On S. wall of track
(q)	+0 35	-1 00	+0 50	100	1650	+1.4	-	780.6	
(r)	+0 55	-1 00	+0 55	100	1750	+1.6	-	782.0	
(s)	+1 05	-0 45	+0 55	100	1850	+1.6	-	783.6	
(t)	+0 30	-0 45	+0 35	100	1950	+1.0	-	785.2	
(u)	+0 50	-0 55	+0 53	100	2050	+1.6	-	786.2	Cross wall at 25'
(v)	+0 40	-1 00	+0 50	100	2150	+1.4	-	787.8	
(w)	+0 35	-1 00	+0 45	100	2250	+1.3	-	789.2	
(x)	+1 00	-1 15	+1 10	100	2350	+2.0	-	790.5	
(y)	+1 00	-1 30	+1 15	100	2450	+2.2	-	792.5	
(z)	+0 30	-0 55	+0 45	100	2550	+1.3	-	794.7	
(aa) - (ab)	+4 05	-4 15	+4 10	100	2650	+7.3	-	796.0	
(ab)							45	798.8	On wall.

STA	HR	BF	WL	WR	FS	BS	Reading	Dist	Cline
234-235	0.7	0.7	12' up small passage	2	196		196	9.9	level
235-236	0.7	0.7	2	3	103		103	31.1	+15.00
236-237	1	0.8	2		200		200 approx	±15	-3 approx
237-238	0.5	0.5		3	100 approx		100 approx	±45	+15 approx
215-239					123.30		123.30	14.0	+8.00
239-240	20	2	5	4		319.30	139.30	64.3	-43.15
240-241	30?	1	5		235.00		235.00	25.6	-18.45
240-242			9	1	008		008	20.0	+16.00
242-243	2	1	4	3	069		069	20.0	+20.00

DOUBLE TROUBLE + DOOMED GROTTO

Sept 17th

204-244					138.00	318.00	4.1	+1.00
244-245	2	1.5	8		351.00	351.00	15.4	-9.00
245-246	1.5	-	1.5	1.5	154.30	234.30	14.1	+8.00
246-247	1.5	1.5	2	1	327.30	327.30	30.2	+1.30

Horiz , Vert , O.D. ,

9.9 — 520.3

30.0 + 8.1 528.4

±15 - 0.8 approx 528.4

~~43~~ + 11.6 approx 539.6

Candy's Calamity

18.8 + 1.9 479.9 In Pitch Chamber

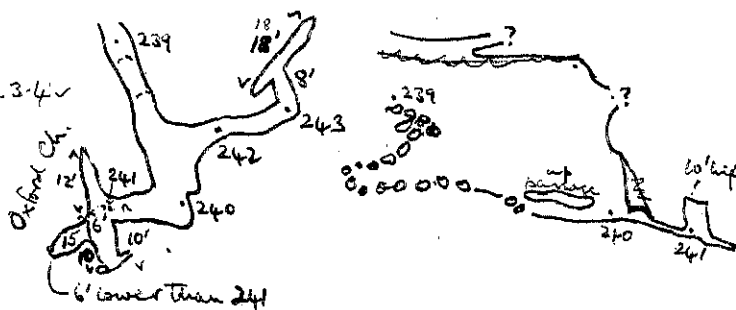
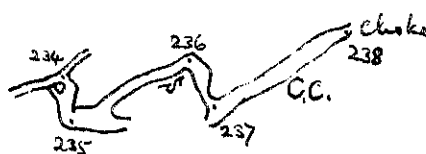
46.8 - 44.2 451.8 Lip of Pitch 8' on

24.3 - 8.2 437.6 241 = 420.2 242 = 423.4

19.2 + 5.5 427.6

18.8 + 6.8 442.1 242 = 449.9

Notes



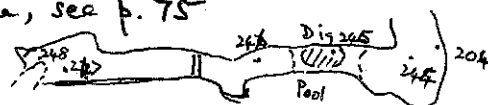
1960 Chris Hawkes

4.1 + 0.1 482.2 204 is start of Double Trouble, see p. 75

15.2 - 2.4 482.3

14.0 + 2.0 479.9 245 is at lowest point

30.2 + 0.8 481.0 At top of slope, near drain pool. Roof heightens just beyond



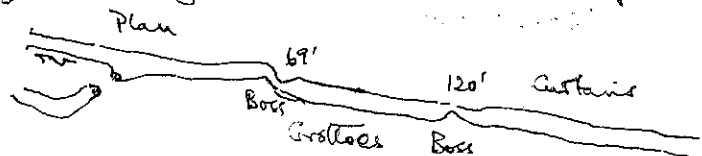
CHEDDAR GORGE LEVELLING.

STATION.	Altitude of Road	Distance	STATION	Altitude of Road	Distance
① - 2	64.7 Feet	50 Feet	④8-49	183.8	50
2	65.4	50 100	49	186.0	67 2400
3	65.8	50 100	⑤0-51	190.3	50
4	66.8	50 200	51	193.4	50 2517
5	68.3	50 200	52	197.0	50
6	69.8	50 200	53	201.6	50 2617
7	73.6	50 300	54	206.8	50
8	76.9	50 400	55	212.0	50 2717
9	78.4	50 400	56	215.4	50
⑩-11	79.9 Pond on North	50 500	57	218.9	50 2817
11	80.1	50 500	58	222.2	50
12	80.7	50 600	59	225.8	50 2917
13	81.3	50 600	⑥0-61	229.5	50
14	82.2	50 700	61	233.7	50 3017
15	82.5	50 700	62	238.2	50
16	84.0 Spot Ht.	50 800	63	243.1	50 3117
17	85.3	50 800	64	248.8	50
18	87.0	50 900	65	254.9	55 3127
19	90.0	50 900	66	260.5	80
②0-21	95.0	50 1000	67	263.9	50 3252
21	99.0 Opposite Goughs	50 1000	68	267.0	50
22	102.0	50	69	270.6	50 3352
23	103.7	50 1100	⑦0-71	274.8	50
24	105.7	50	71	278.4	50 3452
25	107.7	50 1200	72	282.5	50
26	110.4	50	73		50 3552
27	113.3	50 1300	74		50
28	116.8	50	75		50 3652
29	119.6	50 1400	76		50
③0-31	123.2	50	77		50 3752
31	126.3	50 1500	78		50
32	129.7	50	79		50 3852
33	133.5	50 1600	⑧0-81		50
34	137.7	50	81		50 3952
35	141.5	50 1700	82		50
36	145.8	50	83		50 4052
37	150.2	50 1800	84		50
38	154.7	50	85		50 4152
39	159.1	50 1900	86		50
④0-41	162.6 Nich.	50	87		50 4252
41	166.6	50 2000	88		
42	167.5	50	89		
43	170.6	50 2100	⑨0-91		
44	174.8	50	91		
45	177.9	50 2200			
46	180.3	50			
47	181.8	50 2300			

Wash. State Voc. Prof. Leveling

STA	HR	DF	WL	WR	FS	BS	BEARING	DIST	CLINO
247-248	12	1	3	9		182 30	002 30	3.1	+ 14.30
248-249	3	1	8	3	260 30		260 30	9.2	- 12.30
249-250	1	0.5	-	2.5		106 30	286 30	5.1	+ 16.00
250-251	3	1	2		011 15		011 15	15.6	+ 2.00
251-252	(10) 2.5	1	10	5		216 15	036 15	45.4	+ 7.30
252-253	5	3	1	3	343 00		343 00	26.4	+ 4.00
253-254	20	4	-	5		207 30	027 30	6.8	+ 13.30
254-255	15	6	3	2	013 00		013 00	37.4	- 6.00
255-256	5	1	3	(4)		259 00	079 00	8.3	- 17.00
256-257	2.5	1	9	5	004 00		004 00	5.3	- 17.30
257-258	1.5	-	0.5	1		175 10	355 10	25.3	+ 7.00
258-259	1.5	1	1	10	004 30		004 30	40.7	+ 2.30
259-260	15	2	2.5	1.5		170 00	350 00	9.5	+ 2.00
260-261	15	2	2	5	009 00		009 00	13.8	- 6.00
261-262	4	2	2.5	8		175 00	355 00	30.0	level
262	6	1							

Glistening Gallery starts here; is approx 234' long at F.S. 290 + descending about 12°. Constrictions at 69' + 120'.



DOUBLE TROUBLE SERIES

STA	HR	DF	WL	WR	FS	BS	BEARING	DIST	CLINO
262-263	5	1				109 30	289 30	10.7	+ 28.00
263-264	3	1	1	2	291 00		291 00	29.3	- 15.00
264-265	5	0	3	1		100 30	280 30	29.8	+ 1.00
265-266	2	1	2	1	323 30		323 30	15.1	- 16.20
266-267	4.5	0.5	5	0		113 00	293 00	17.5	- 18.00
267-268	10	1	4	4	315 30		315 30	17.2	- 15.00
268-269	2	0.2	2.5	2.5	333 00		333 00	7.3	level
269-270	3 Haven (0.5')	0	3	0.5		139 00	319 00	25.5	- 8.30
270-271	(22) 5	1	1	4	327 40		327 40	25.9	- 7.00
271-272	(20) 10	0	5	0		134 30	314 30	40.0	- 5.00
272-273	(15) 6	2	DIAGONALLY 2.5	6	011 00		011 00	12.7	- 14.00

VICARAGE PASSAGE SURVEY BY OLIVER C. LLOYD

STA	HR	DF	WL	WR	FS	BS	BEARING	DIST	CLINO
273-L12					214 00		214 00		
L12-L11					214 00		034 00	5.5	11.8
L11-L10					204 00		024 00	5.5	0.00
L10-L9					244 00		064 00	19.0	7.7
L9-L8					168 00		348 00	15.3	19.0
L8-L7					082 00		262 00	15.3	- 9.00
L7-L6					172 00		352 00	11.0	+ 10.00
L6-L5								1.2	+ 90.00
L5-L4					158 00		338 00	42.8	+ 8.00
L4-L3					076 00		256 00	23.7	- 12.00
L3-L2					128 00		308 00	15.0	0.00
L2-L1					145 00		325 00	10.3	- 4.00
L1-L10					181 00		001 00	19.7	+ 11.00

Sta	HR	DF	WC	WR	FS	BS	Bearing	Disc	Chino
L10'-L9'						058 00	238 00	39.0	-18.00
L9'-L8'						324 00	144 00	15.4	-10.00
L8'-L7'						156 00	336 00	10.0	-56.00
L7'-L6'						142 00	322 00	7.3	-21.00
L6'-L5'						188 00	008 00	4.2	-26.00
L5'-L4'						135 00	315 00	20.0	-43.00
L4'-L3'						346 00	166 00	10.7	-12.00
L3'-L1'						353 00	173 00	10.0	-36.00
L1'-PSP						058 00	238 00	50.0	-26.00
L1'-L2'						136 00	316 00	14.0	0 00
L9'-L13						290 00	290 00	22.0	-13 00
L13-L14	5	3				342 00	342 00	32.2	0 00
L14-L15	3	0				336 00	336 00	23.0	+3 00
L15-L16						352 00	352 00	20.8	+8 00
L16-L17						014 00	014 00	25.0	+25 00
L17-L18						290 00	290 00	35.5	-17 00
L18-L19						323 00	323 00	28.0	0 00
L19-L20						286 00	286 00	35.5	-11 00
L20-L21						002 00	002 00	17.0	+11 00
L21-L22						016 00	016 00	23.0	-22 00
L22									

Above lip of Vicarage Pot.

Continued on p. 37

Shutter Passage					Sept. 3 rd -4 th 1963			
276-277	1.5			003 00	183 00	5.2	-19.30	
277-278	10	1	8	15	247 50	247 50	6.8	-34.30
278-279	1.5	0	4	0.5	014 00	194 50	8.3	-14.30
279-280	1	1	1.5	2	227 50	227 50	10.8	-18.00
280-281	1	0	2	0	000 00	180 00	18.0	+26.45
281-282	3	2	3	6	183 10	183 10	13.7	+7.20
282-283	3	1	2	0	273 00	193 50	4.2	0.00
283-284	1	0	1	2	348 20	168 20	21.5	+23.30
284-285	10	3	6	3	111 15	111 15	17.7	+18.30
285-286	10	5	0	6	346 30	166 30	16.7	+10.00
286-287	6	5	3		055 10	055 10	17.8	+19.00
287-288	5	8	2	6	314 00	134 50	46.5	+25.15
288-289	10	6 to lip	7	10	198 20	198 20	24.5	-16.00
289-290	5	2	11	3	295 10	115 10	53.3	-16.00
290-291	7	3	15	4			2.2	+90.00
291 Δ⊕								
289-292					250 00	070 60	37.8	+6.30
292-293	2	1	2	3	078 50	078 50	18.5	+19.00
293-294	2	1	6	1	172 10	352 10	12.5	+19.00
294-295	3	1	3	3	339 00	239 00	19.1	+43.00
295 Δ⊕								

to passage entrance

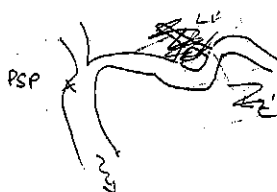
15' with stream

15' looking on

Bearings magnetic, var. 8° W (?)

Notes

#	V	OD
37.0	-12.0	458.0
15.2	-2.7	445.4
5.6	-8.3	442.4
6.8	-2.6	434.0
3.8	-1.8	431.3
14.6	-13.6	429.4
10.4	-2.2	415.5
8.1	-5.9	413.1
45.0	-22.0	407.0
14.0		



281.0
384.0
7.0

PSP = 384.0, 4' above stream level.

21.5	-5.0	445.5
32.2	—	437.4
22.9	+1.2	427.4
20.6	+2.9	421.4
22.6	+10.6	440.5
34.0	-10.4	455.1
28.0	—	444.7
34.8	-6.8	442.7
16.7	+3.2	427.9
21.3	-8.6	421.1

"compass reads 0°30' too little". i.e. Var = 7°30' W.

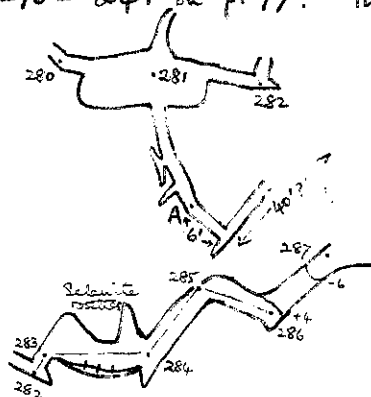
✓ 432.5

Fred Davies.

Variation 8°40' W.

4.9	-1.7	428.4
5.6	-3.9	427.7
8.0	-2.1	423.8
10.3	-3.8	421.7
16.0	+8.1	418.4
13.6	+1.7	428.5
4.2	0.0	428.4
19.7	+8.6	428.0
16.8	+5.6	436.0
16.4	+2.9	421.3
16.8	+5.8	428.6
42.1	+19.8	457.1
23.5	-6.8	427.8
53.2	-15.3	413.1
0.0	+2.2	428.2

276 = 241 on p. 77. In Oxford Chamber.

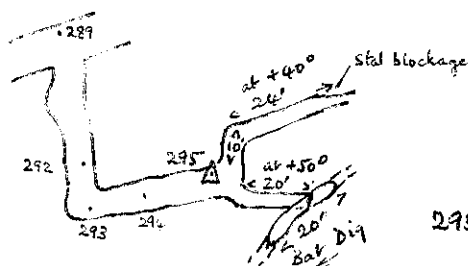


281 → A is 18' at 283°, dino - 10°.

Up 4' at 1'. Down 6' at 12' : - Section

Up 8' at 45', overhanging. Dig 15' long at 222° below overhang, in fault.

Passage continues in same line 15' beyond 290 to sump
291 is drillmark 6' above floor on wall facing back up main passage.



c. 5' above floor passage.
295 is drillmark on stal flow on left facing down.

Ver 2 X 6

