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WATER ANALYSIS

by

D.T. Richardson. A.R.I.C.

The accompanying tables (Table 5 & 6) give details of samples of water taken from various caves, potholes and lead mine levels.

TABLE 5 CAVES AND POTHOLES

Middle Washfold – Great Douk Cave System

Analyses confirm that the water passes rapidly through this system. The free carbon-dioxide, non-alkaline hardness and magnesium salts remain constant but there is a pick up of calcium carbonate. The amount of calcium carbonate dissolved by the water passing through this system amounts to some 190 lbs. calcium carbonate per million gallons.

Gorden Pot

The water reaching the sump of this system not only picks up calcium but also shows an increase in the magnesium and non-alkaline hardness salts - the alkaline hardness (calcium and magnesium bicarbonates) remaining constant. These figures suggest that this water is supplemented by waters from other sources. During its course from the surface to the sump the water has dissolved some 160 lbs. of limestone per million gallons.

WATER ANALYSIS

ANALYSES OF WATERS FROM VARIOUS CAVES AND POTHOLE

TABLE 5

Date 1964	CAVE, POTHOLE	NGR	HARDNESS			Ca. Salts CaCO ₃	Mg. Salts CaCO ₃	Free CO ₂ CaCO ₃	pH
			TOTAL	ALK.	NON				
			CaCO ₃	CaCO ₃	ALK. CaCO ₃				
3-5	Middle Washfold Sink	SD 748. 764	27.0	11.0	16.0	22.0	5.0	4.5	6.9
3-5	Middle Washfold Stream	“	38.0	20.0	18.0	31.0	7.0	4.5	7.1
3-5	Leaving Gt. Douk Cave	747. 770	46.0	30.0	16.0	40.0	6.0	4.5	7.2
5-10	Goyden – Stream Entering	SE 099. 761	81.0	72.0	9.0	58.0	23.0	-	-
5-10	Goyden – Sump	099. 761	97.0	74.0	23.0	62.0	35.0	-	-
14-6	Disappointment-Stream entering	SD 750. 726	92.0	76.0	16.0	82.0	10.0	18.2	7.1
14-6	“ 1st Pitch	“	112.0	92.0	20.0	102.0	10.0	13.6	7.3
14-6	“ 5th “	“	112.0	92.0	20.0	100.0	12.0	9.1	7.3
14-6	“ Henslers Passage - Far End	“	97.0	80.0	17.0	88.0	9.0	13.6	7.3
14-6	“ Inlet Near Head of 1st Pitch	“	133.0	113.0	20.0	119.0	14.0	2.3	7.5

Results in milligrammes per litre

Analyses by D.T. Richardson, A.R.I.C.

**ANALYSES OF WATERS FROM VARIOUS MINE LEVELS IN THE
— GREENHOW AREA —**

TABLE 6

Date 1965	LEVEL	NGR SE	HARDNESS			Ca Salts CaCO ₃	Mg Salts CaCO ₃	Free CO ₂ CaCO ₃	pH
			Total	Alk.	Non- Alk.				
			CaCO ₃	CaCO ₃	CaCO ₃				
2-5	Josse Stream	110661	107.0	61.0	46.0	64.0	43.0	-	-
2-5	Gillhead Stream	067621	173.0	114.0	59.0	134.0	29.0	-	-
9-5	“ Roof Drip	“	171.0	109.0	62.0	155.0	16.0	-	-
19-5	“ Roof Drip	“	172.0	94.0	78.0	143.0	29.0	-	-
13-6	Jackass Stream	114647	124.0	96.0	28.0	86.0	38.0	6.8	7.3
13-6	Cockhill Stream	114649	222.0	189.0	33.0	186.0	36.0	9.1	7.5
13-6	Gill Field Stream	116649	172.0	145.0	27.0	145.0	27.0	11.4	7.3
13-6	Sam Oon Stream	110646	58.0	26.0	132.0	44.0	14.0	22.7	6.7
19-6	Blackhill Stream	0793.							
		6320	194.0	166.0	28.0	147.0	47.0	4.5	7.5
25-6	Blackhill Stream	“	121.0	92.0	29.0	99.0	22.0	6.2	7.3

Results in Milligrammes per litre

Analyses by D.T. Richardson, A.R.I.C.

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Disappointment Pot

The series is interesting - the water appears to dissolve some calcium carbonate during its journey from the entrance to the head of the first pitch yet appears to dissolve no more calcium carbonate between the first pitch and the fifth pitch despite the fact it is charged with free carbon dioxide.

The water which appears at the far end of Henslers passage isn't materially different from that of the surface stream entering Disappointment Pot.

The water which joins the min stream near the head of the first pitch contains more dissolved calcium carbonate than the remainder of the samples examined but has a similar non-alkaline hardness and magnesium content. The lower free carbon dioxide content of this water is reflected in the slightly more alkaline p.H. value.

LEAD MINE LEVELS**TABLE 6****Josse Level**

Perhaps the most interesting feature is the relatively high proportion of magnesium salts in this water. Until a series of samples have been obtained there is very little one can say about this particular water.

WATER ANALYSIS

Gill Head Level

All three samples show marked similarities and the variations in composition are probably not very significant.

Jackass, Cockhill, Gill Field and Sam Oon Levels

The first three obviously originate in limestone strata and show a moderately high proportion of magnesium salts as seems common to most of the waters in this area. The water issuing from Sam Oon level is however significantly different - it is slightly acid, low in total hardness and high in free carbon dioxide and has the characteristics more of a millstone grit water, alternatively it may be derived from a very shallow source and be in fact almost entirely surface water.

Blackhill Level

This water shows marked fluctuations in composition, Regular sampling of this source should provide interesting figures - the two samples were taken only one week apart.

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