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WATER ANALYSES.

by

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

The accompanying tables give details of samples examined during the last few months.

Littondale Waters:

If we leave out the water from Sleets Gill it will be seen that all the remaining waters are very alkaline having p.H. values between 7.9 and 8.85.

Sleets Gill water is of interest it is heavily charged with hardness salts, has a high free carbon dioxide content and probably as a direct consequence

ANALYSIS OF WATERS FROM MISCELLANEOUS SOURCES

	HARDNESS			Ca Salts CaCO ₃	Mg. Salts MgCO ₃	Free. CO ₂	p.H.
	Total CaCO ₃	Temp. CaCO ₃	Perm. CaCO ₃				
Spring Issuing From Base of Kilmsey Crag. SD974.684 20.10.63	246.5	221.0	25.5	229.3	14.5	15.0	7.1
Capnut Cave Well, Thorns Gill, Ribblehead. SD.7900.7967. 20th. Oct.1963	40.5	31.0	9.5	37.0	2.9	NIL	7.3
Black Keld Rising, Wharfedale SD9743.7099. 3rd, Nov.1963	101.2	78.8	22.4	85.7	13.1	5.0	7.3
Marble Steps Pot, Gregareth SD.680.7707. Intestines Route, 1st. March 1964							
Surface Stream Entering Pot	50.8	24.0	26.8	46.3	3.7	1.0	7.4
Main Stream Bottom of 1st Pitch.	62.4	35.0	27.4	53.5	7.5	1.0	7.3
Final Sump.	70.5	42.0	28.5	60.7	7.5	1.0	7.4
Bottom of 80ft. Blind Pitch	82.1	51.0	31.1	69.6	10.5	1.0	7.2
Stream in side passage near bottom of 1st. Pitch before waterfall	128.9	92.0	36.9	118.7	8.7	1.0	7.4
Lost John's System, Leck Fell. SD 670.786. 9th. Feb.64							
Surface Stream Entering Cave.	29.4	9.0	20.4	24.1	4.5	3.0	6.3
Main Stream at Battle Axe Pitch.	35.7	16.0	19.7	30.3	4.5	3.0	6.3
Main Stream just before Master Cave.	40.1	20.0	20.1	35.7	3.7	2.0	6.3
Manchester Hole, Nidderdale SE100.763 River Nidd Water Entering pot, 7th.Mar.1964	74.0	46.0	28.0	49.1	21.1	Nil	8.1
Nidd Heads Rising SE 105. 7315. 7th. March 1964.	84.7	47.0	37.7	59.8	21.0	3.0	7.3
Results in milligrammes per litre. (Parts per million).							
Analyses by D.T. Richardson, A.R.I.C.							

WATER ANALYSES

ANALYSIS OF WATERS FROM STREAMS AND SPRINGS IN LITTONDALE

	NGR. SD	HARDNESS			Ca Salts CaCO ₃	Mg. Salts MgCO ₃	Free. CO ₂	p.H.
		Total CaCO ₃	Temp. CaCO ₃	Perm. CaCO ₃				
Foxup Beck	8722. 7677	113.4	95.0	18.4	102.3	9.4	Nil	8.1
Cosh Beck	8705. 7715	97.4	82.5	14.9	91.2	5.6	Nil	8.3
Stream Entering Cosh Beck	8710. 7704	153.5	142.5	11.0	129.1	20.6	2.0	7.9
Stream Entering Cosh Beck.	8720. 7690	146.8	132.5	14.3	124.6	18.8	Nil	8.2
Halton Gill Beck.	8812. 7649	126.8	107.5	19.3	102.3	20.6	Nil	8.1
Newshot Gill.	8857. 7590	118.5	104.0	14.5	100.0	19.8	Nil	8.3
Stream on Rice Side Barns.	8883. 7546	133.5	115.0	18.5	117.9	13.1	Nil	8.2
River Skirfare, near Helesden.	8900. 7489	132.0	119.9	12.1	98.2	35.6	Nil	8.85
Helesden Beck just before going underg'd	8882. 7460	208.3	162.0	46.3	137.2	41.0	Nil	8.5
Spring Near Litton Pots.	9032. 7384	135.5	115.0	18.5	122.3	9.4	Nil	8.3
Stream Near Stonelands	9145. 7363	157.9	142.5	15.4	151.3	5.6	3.0	8.1
Cowside Beck at Arnside Bridge.	9303. 7193	157.4	149.8	7.6	130.5	28.5	Nil	8.7
Stream from Springs Cave	9414. 7100	205.3	191.8	13.5	137.2	71.2	Nil	8.5
Stream at Hawswick Cote.	9480. 7047	183.0	178.0	5.0	154.2	30.2	Nil	8.3
Stream leaving Sleets Gill Cave.	9606. 6945	255.8	230.0	25.8	231.4	20.6	11.0	7.2

Samples collected 3rd. November 1963.
Results in milligrammes per litre. (Parts per million).
Analyses by D.T. Richardson, A.R.I.C.

to the high CO₂ a low p.H. (7.2).

Springs cave water has an unusually high magnesium content. It is however interesting to note: the great variation which occurs in the magnesium content of these waters.

No general conclusions can be drawn from the series until more samples from each source have been examined.

Kilnsey Crag The relatively high free carbon dioxide content of this water is interesting. A continuous study of this particular source will probably produce interesting calcium carbonate:Free CO₂:p.H.ratios.

Capnut Cave Well, Thorns Gill The analysis suggests that this water is probably not very different from that of Thorns Gill itself. Regrettably a sample was not taken from the gill at the time. A further study of this water is to be made.

Black Keld water It would be foolish to make any general comment on this isolated sample. Again a continuous study of this rising will be the only method by which any figures of general interest will be obtained. It is included in this current list for the benefit of those readers who may have taken samples and would like to compare results.

Marble Steps Pot This series of samples provides interesting figures. In particular it will be noted that the water in the final sump contains 31.3 parts per million more calcium carbonate (total hardness) than the stream water entering the pot. This means that everyone million gallons of water has dissolved 313lbs of limestone in its journey from the surface to the final sump.

Lost John's System This series also shows how the amount of hardness salts in solution in the water increases as one descends further into the system.

Manchester Hole and Nidd Heads The same remarks can be said about these samples as the water entering Manchester Hole reappears at Nidd Heads.

These samples from potholes are the first we have taken along these lines and I would like to thank our Caving Officer (Mr. William Emmott) for having taken the samples for me.