MEMOIRS
1964

Wilcock, J.D. 1964
"The 1964 Southern Region National Meeting of
the Cave Research Group of Great Britain"
Memoirs No.2 NCMRS, pp.25-26

Published by the

THE NORTHERN CAVERN & MINE RESEARCH SOCIETY
SKIPTON U.K.

NB
This publication was originally issued in the 10 by 8 inch format then used by the society. It has now been digitised and reformatted at A5. This has changed the original pagination of articles, which is given in square brackets.

REPORT ON THE 1964 SOUTHERN REGION NATIONAL MEETING OF THE CAVE RESEARCH GROUP OF GREAT BRITAIN

by

J.D. Wilcock, B.A. (Oxon.), B.Sc.

The Southern Region National Meeting of the Cave Research Group of Great Britain for 1964 took place on the 2nd and 3rd May, at Wells.

Two papers were given at the meeting in the lecture room of the Museum, Wells, at 5.0 p.m.: 'A study of calcite solutions at 10°C' by Dr. R.G. Picknett, and 'Caving in Arctic Norway' by members of the S.W. Essex Technical College Caving Group.

Dr. Picknett gave an account of his experimental determinations of the pH of calcite solutions of a wide range of concentrations, and at 10°C, chosen as the approximate temperature of a cave. He claimed that this was the first time that the pH of calcite solutions had been measured to any degree or accuracy under experimental conditions, and further that the experimental results, carefully checked, and corroborated by the experiments of at least one other worker in the field, did not correspond to previous theoretical calculations of Trembe, which have up to know have been widely used in the classification of ground waters. The equilibrium between the carbon dioxide content of the air and the calcium content of the water was described, in conjunction with the ions present in solution, $Ca^{\cdot\cdot}$, $CaHCO_3$ and to a limited extent ($CaCO_3$).

The new results may perhaps be attributed to the accuracy of the equipment used. Two types of modern pH meters were described and demonstrated: a. miniature meter costing about £40 manufactured by Analytical Measurements Ltd., Dome Buildings, The Quadrant, Richmond, Surrey; and a somewhat more robust instrument at £60 by Derritron Instruments Ltd., Parklands', Cainscross, Stroud, Glos. The use of the second type of instrument with a saturometer cell was described in detail. If powdered calcite is added to the unknown solution in the saturometer cell, the pH will increase so if the water is aggressive (subsaturated with calcite) 2nd decrease if it is supersaturated. By using the experimental curves it is also possible to determine the degree of super- or subsaturation. It is important that the temperature be kept constant during the pH measurement in the saturometer, and this may be achieved in the field by immersing the cell in the source of the water being measured.

The presence of trace elements in solutions have been found to effect the pH markedly, giving a large alteration in pH for small concentrations of the trace element. Larger concentrations curiously have smaller effects on the pH. The relative effects of copper, lead and manganese trace elements, commonly found in cave waters, were

described. The metallic ions become absorbed onto the calcite molecules as the water flows over exposed limestone in caves.

Several important and interesting points were raised in discussion of the paper. Solutions may be taken out of caves for later analysis if precautions are made to prevent the loss of carbon dioxide by means of an air-tight stopper. However, measurements must be made at the temperature prevailing at the source of the sample, and the main difficulty arises in the fulfilment of this condition. The saturometer method is very versatile, e.g. different powdered chemicals may be used in it to find out whether the samples are aggressive towards these substances. Modern pH meters are compensated for temperature changes, and this facility accounts for much of the cost of the instruments. The saturometer cell may be made of polythene to prevent breakage in caves, but such a cell is not known to be manufactured at present. Traces of the element iron in cave waters have effects similar to those described for copper, lead and manganese. The second paper, given by Mr. D. St. Pierre and Miss S. Drakes took the form of a selection of excellent slides of the S.W.E.T.C. expedition to arctic Norway. Much of the exploration took place in the Gratadalen area, where the limestone takes the form of a bed about 1200 feet thick. The micaceous limestone is vertically bedded, contorted in places, and containing quartz nodules, which form prominent 'pendants' in many a cave roof. Some caves consisted of short passages parallel to surface with frequent sinks and risings. The area appears to have been recently glaciated. Many cave muds were found to consist largely of mica particles, arising from solution of the limestone. In general not many formations occur in the caves, but a few caves have fine straws, stalactites, and crystal pools.

Dr. Oliver C. Lloyd proposed a vote of thanks to the speakers, and the meeting then adjourned. Many members took the opportunity to view the pH meters on display, the maps and photographs of the S.W.E.T.C. expedition, and the stall for the sale of caving publications provided by the Mendip Cave Registry. Later a very enjoyable dinner took place at the Star Hotel, Wells. As an extension of the social gathering of the meeting this was most successful.

On Sunday, 3rd May, caving trips were arranged to Lamb Lair, West Harptree, which provided a congenial round-up to the weekend. The Mendip Caving Group is to be congratulated and thanked for the organisation of successful a meeting.