FARNHAM GEOLOGICAL SOCIETY

vol - No.

NEWSLETTER SEPTEMBER 1976

The main feature of this issue is an original contribution to local geology. One of the objects of the Society is to promote such study, and your Committee would like to see reports of this nature appearing regularly in the newsletter.

The lighter side of geology is described on this page by a pseudonymous member; and Stanley Young has begun extracting from a rich vein (lode, ...) of unusual information. To all the contributors, our thanks; and a special tribute to Roger Ashcroft for his production of former newsletters.

Noel Ream

News of members

Congratulations to Ian Carolan and David Taylor on attaining Geology A-level passes this summer.

AN EXPEDITION TO LULWORTH

by A Geology Wife

It's 8 a.m. on Sunday 4th July. What is happening in Castle Street? Who are these strangely-booted figures carrying hammers? Is it an invasion? Oh no, it's one of Paul's geology field trips.

A smooth and fast coach trip, with Doug at the helm, brought us all to Kimmeridge village by 10.30 a.m. where we made our way down to the bay. Here the ammonites nearly dropped out of the cliffs to greet us, and many good specimens were collected. Unfortunately, the shales are very friable and many would-be finds were shattered so that most of us are now the proud owners of ammonite pieces. Our morning was slightly interrupted by an irate landowner who thought vandals had arrived to demolish his cliffs. He was reassured that we were being very selective in our hammering, and happily went off for his swim.

We left Kimmeridge at lunch time and set off for the 'local' to quench our thirst - quite a distance in fact, as Kimmeridge seemed to be the only village in Dorset without a pub! En route along a narrow road over the Downs, we were stopped abruptly by a local van driver who threatened to report the lot of us to the police, as the road was closed to all coach traffic. We await our arrest! Having recuperated at East Lulworth, we made our way down to a packed Lulworth Cove. Here the temptation of lying in the sun proved too much for at least one member of the party, so I will write the rest from hearsay.

The party tramped off, over the browning bodies strewn at all angles on the beach, towards the eastern side where the Purbeck beds are spectacularly exposed. The more hardy members clambered up and over the cliffs to the Fossal Forest while others sought out the elusive Mammal Bed on the western cliffs. No fossil crocodiles, however, surrendered, despite much effort on the part of several members.

We left Lulworth Cove at 5.30 p.m. and arrived at a nice secluded pub in the New Forest just at opening time. Feeling duly refreshed, we set off for Farnham and returned about 9 p.m. after a very enjoyable day.

SOME FEATURES OBSERVED IN THE SUPERFICIAL AND SOLID FORMATIONS AT LOWER FROYLE QUARRY, NEAR FARNHAM

I. Carolan, M. Dearsley, P. Olver, D. Smith and D. Taylor

A. INTRODUCTION

Lower Froyle village lies about half way between Farnham and Alton 1 km to the north of the A31. The quarry is situated ½ km to the north of the village along the minor road to Well. National Grid Reference SU 762447, O.S 1/50,000 sheet 186 (Aldershot and Guildford).

The broad geological features of the locality are shown on the Basingstoke Geological sheet 284. The main aim of this research is to describe, for the first time, the varied superficial deposits lying unconformably on the Lower Chalk (1) exposed in the quarry. These deposits owe their origin to periglacial (2), fluvioglacial and fluvial processes. Examples of similar deposits, associated with the Chalk, have been reported by several authors (Chartres & Whalley 1975, Ward & Cooper 1975, Thorez et al 1971, Hodgson et al 1967).

B. GENERAL DESCRIPTION

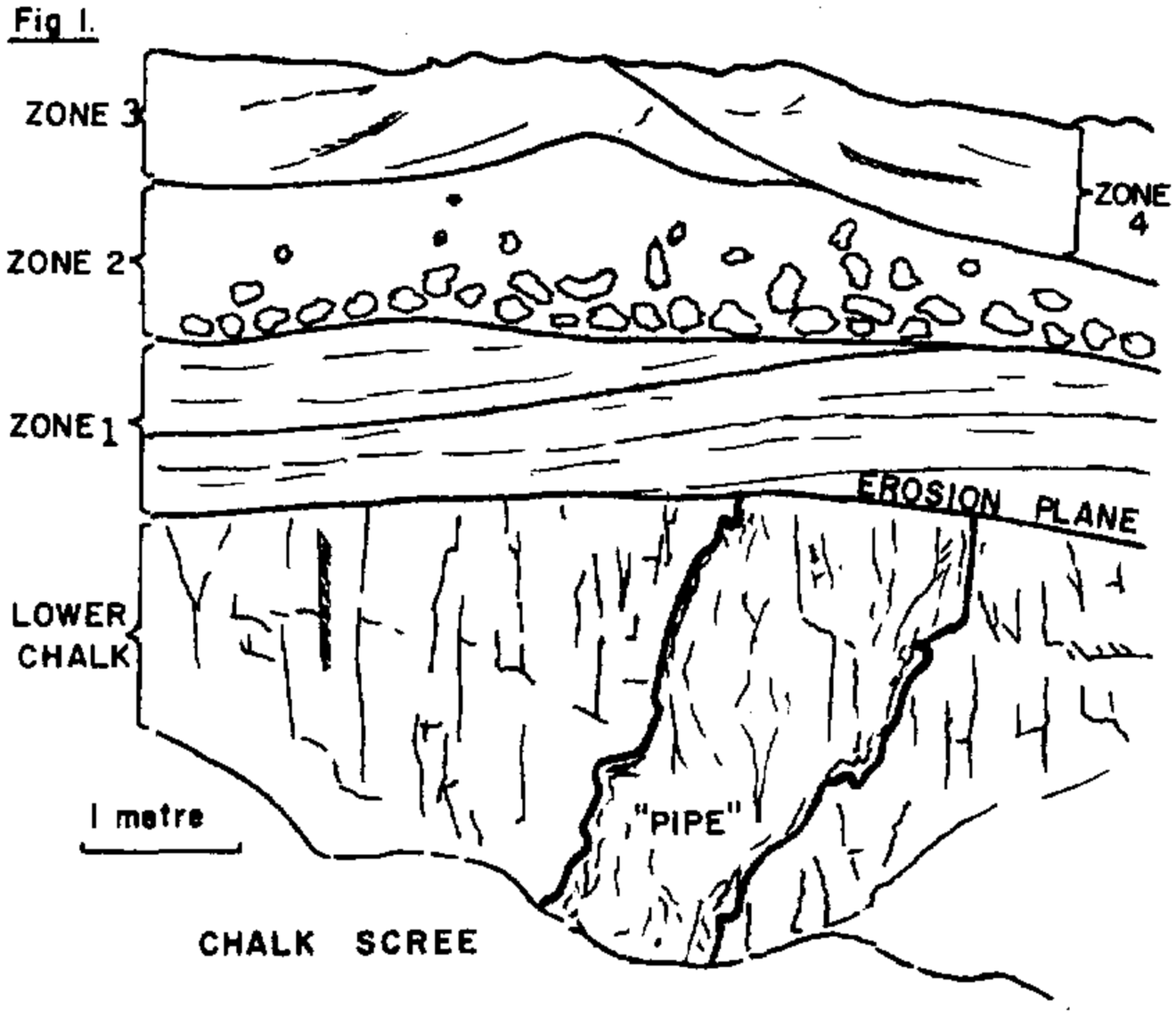
Lying unconformably on the eroded Chalk surface is a mantle of solifluction (3) Chalk. Both the solid and the drift formations are penetrated by a number of "pipe-like" features containing a reddish brown infill. In the exposure illustrated in Fig. 1 such a pipe in the Lower Chalk is covered by solifluction deposits, which are themselves overlain by graded channel-fill deposits.

C. "PIPE-LIKE" FEATURES

Exposures of these features showing their cross-sectional shape have yet to be found. However, longitudinal sections show that the pipes are 1-1.5 m in width and some are greater than 3 m in length. They are infilled with arenaceous materials, which range from silty clays to fine sands. They also include nodular flints, presumably derived from the Middle or Upper Chalk. The outermost 10-15 cm of infill is olive green in colour but grades inwards to a light reddish brown.

D. EXPOSURE 1. SOUTH END OF QUARRY (SU 762447)

Fig 1.



In this section (see Fig. 1.) a near vertical pipe is exposed which penetrates the Lower Chalk. The Chalk here is indistinctly bedded with prominent vertical jointing and dull greyish white in colour. The pipe at its widest point is 1.45 m in thickness and narrows to 1.2 m , with an average width of 1.3 m The contact with the surrounding Chalk is clear and sharp. Resting unconformably on the Chalk surface are deposits of graded chalky rubble which in part have been channelled and infilled.

The individual zones will now be described in detail (Fig. 1).

Zone 1. Lying directly on the Chalk surface, this horizon shows a graded sequence of subangular and rounded chalk fragments. Only a small amount of clayey material is present, forming a reddish brown matrix.

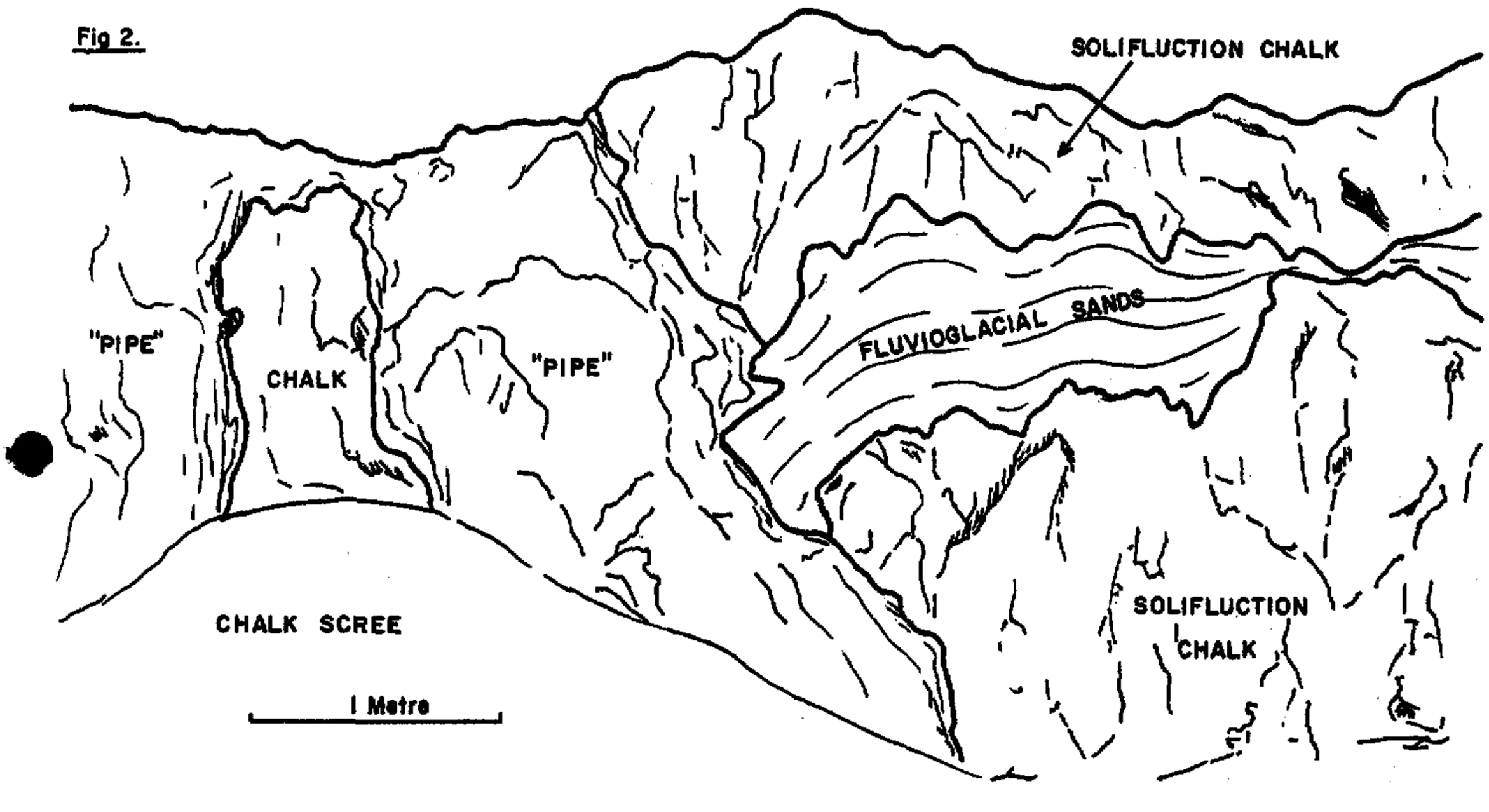
Zone 2. This horizon, lying on an eroded surface of Zone 1 is similar to Zone 1 in size and appearance of its constituent rubble. As in the lowest zone the particle size fines upwards to a clay grade. A little brownish clay is also incorporated within this zone.

Zone 3. Coarse angular and subangular chalk rubble up to 30 cm in diameter form the basal layer of this zone. Fragment size fines upwards with the interstitial spacies being filled with fine chalky rubble and a reddish brown clay.

Zone 4. This horizon is on the south side of the exposure and consists of material similar in appearance to Zone 1. The succession indicates an infill channel of a later date, since Zone 3 has been truncated and the underlying solid Chalk has been eroded into a shallow channel form.

E. EXPOSURE 2. UPPER LEVEL OF QUARRY (SU 762448)

Fig 2.



This exposure is situated in the upper part of the quarry. This face, consisting totally of solifluction chalk, forms a small semicircular embayment on the northern side of the quarry. Two main features were studied (see Fig. 2):

1. A large near vertical pipe about 2 m in width containing a central mass of Chalk, whose base has not yet been determined. Again, the pipe is infilled with material similar to that already described in exposure 1.

The infill is clearly zoned, with greyish clay at the contact with the Chalk and grading inwards through brown to yellow brown at the centre.

2. A discontinuous horizon of well bedded sands forming distinct lenses which outcrops adjacent to the pipe. This strongly suggests that these sands once formed a continuous horizon which has been segmented by the load pressure of the overlying solifluction Chalk. This deformation of the sand horizon could owe its origin to periglacial processes occuring within the active layer (4).

F. FUTURE RESEARCH

(i) A paleontological determination of the exact age of the Chalk within the quarry.

(ii) A detailed survey of the two exposures described.

(iii) Determination of the origin and age of the "pipes", and their relationship to the solifluction Chalk, fluvioglacial sands and channel-fill deposits.

GLOSSARY

(1) Lower Chalk:- as determined from sheet 284.

(2) Periglacial conditions:- conditions that exist adjacent to an ice cap where the ground below approximately 2 m is permanently frozen.

(3) Solifluction:- the slow downhill movement of a soil or scree cover under periglacial conditions as a result of the alternate freezing and thawing of the contained water within the active layer (see 4).

(4) Active Layer:- the upper 2 m of a periglacial terrain which undergoes summer thawing and becomes mobile.

REFERENCES

Chartres, C.J., & Whalley, W.B. 1975. Evidence for Late Quaternary Solution of Chalk at Basingstoke, Hampshire. Proc. Geol. Ass., 86(3), 365-72.

Hodgson, J.M., Catt, J.A., & Weir, A.H. 1967. The Origin and Development of Clay-with-Flints and Associated Soil Horizons on the South Downs. Jour. Soil Sci., 18, 85-102.

Thorez, J., Bullock, P., Catt, J.A., & Weir, A.H. 1971. The Petrography and Origin of Deposits Filling Solution Pipes in the Chalk, near South Mimms, Hertfordshire. Geol. Mag., 108, 413-23.

Ward, D.J., & Cooper, J. 1975. Late Quaternary Solution of Chalk at Basingstoke, Hants. Proc. Geol. Ass., 87(1), 101-3.

Extracts from a glossary of mining terms I: Taken from Symons' Gazetteer of Cornwall, 1884

Adit-level - horizontal drift or tunnel through which the water pumped or drawn by the engine from the bottom of the mine, and water descending by percolation, passes off by gravitation. This level is usually begun at the bottom of the deepest nearby valley, and extended through the whole of the mine. It is often (always when convenient) driven on a lode, which it proves in its progress; or on a flookan or crosscourse, when more convenient, because less expensive than when driven through the 'country'. There are deep and shallow adits. Gwennap adit, including branches, is about 33 miles long, its greatest depth 70 fathoms.