What of future visits? Foreign cavers seem welcome, but an official party would be essential to obtain keys (and guides if requested) for the caves. The caving areas are by no means worked out, and there is certainly more scope for new discoveries than in this country. Slovakia is in my opinion the best area, and with the Tatra Mountains nearby, the scenery both above and below ground is magnificent. The only drawback is the distance, for it is about 1000 miles from Calais!

In conclusion, I would like to thank all concerned both here and in Czechoslovakia for this excellent holiday.

Pembroke College, G. Stevens.
Oxford.
November, 1964.

(This account is reprinted by kind permission of the Editor of the Wessex Cave Club Journal).

AN UNUSUAL KARSTIC PHENOMENON IN THE PERUVIAN ANDES.

Around La Oroya, a smelting town high in the Andes of Central Peru, the scenery is reminiscent of the wilder parts of the Craven Uplands of the West Riding. A rolling limestone plateau lying some fourteen thousand feet above sea-level is the main feature of the relief. Valleys, 500 to 1000 feet deep and sometimes glaciated, dissect the plateau. Clear, cold air blows briskly across this high grassy surface and spells of brilliant sunshine are punctuated by sudden showers often of sleet or snow - all in startling contrast to the cloudy but rainless desert at the western foot of the Andes or the hot and humid Amazonian forests to the east.

The chief river draining the plateau is the Mantaro, which follows a longitudinal course towards the S.E. for 200 miles and then, turning north-eastwards through the outer ranges, descends to the Amazonian plains. Around La Oroya the valley of the Mantaro is about 200 yards wide - a limestone gorge in fact - but below Jauja it broadens into the 5-mile-wide Huancayo Basin.

The greater part of the floor of the gorge and of the basin is occupied by a flat river-terrace or series of terraces lying about thirty feet above the river. In the gorge section the river is confined to a steep-sided ravine and in the basin section to a floodplain of limited width. Roads, railways, villages and towns all take advantage of the river-terrace.

A few miles above La Oroya the Mantaro is joined by a tributary valley taken by the road to Tarma. Until about the end of 1957 the stream which emerges from the side-valley flowed across its own

alluvial fan, then crossed the main terrace and finally plunged over a waterfall into the Mantaro. The stream occupied a bed which was cut no more than three feet into the alluvium.

One day a 100-yard long section of the course disappeared into a ravine which opened up across the alluvium, destroying the waterfall as a result. The floor of the ravine was roughly graded to the level of the main river and hence the depth was 20 to 30 feet at its mouth. This depth declined slightly upstream and a steep head connected the new course with the old one which still survived further up the fan. In width the ravine-floor varied from 5 to 20 feet and it was covered with angular blocks of alluvium. The suddenness of the event and the loss of the attractive waterfall led to the occurrence becoming well-known in the district.

It would seem that in all probability the phenomenon was an unusual kind of cavern-collapse. The collapse of caverns in solid limestone giving rise to gorge-like watercourses is known to be typical of well-developed karstic relief.

It may be suggested that: 1. in this case the alluvial terrace which occupies the floor of a valley cut in noticeably soluble limestone was permeated by lime-rich waters;

2. the lime was precipitated - perhaps mainly in the drier winter season - as a cement, thus imparting to the alluvium some of the characteristics of a true limestone;

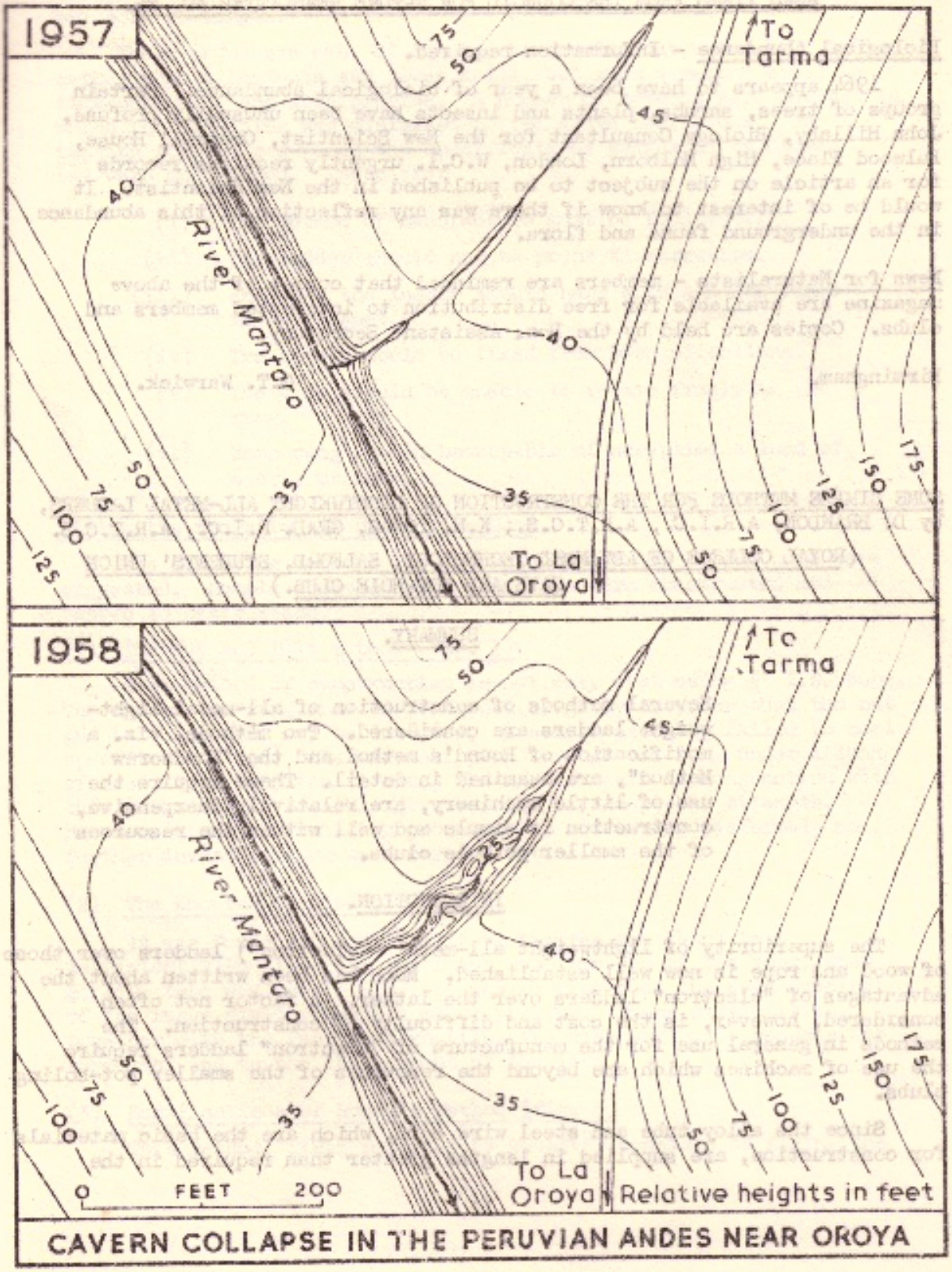
3. an underground watercourse, graded to the local base-level (the River Mantaro), was developed by solution and

4. eventually the roof of the passage conducting the underground waters collapsed, and the waters which had in part continued their surface course to the edge of the terrace were swallowed up by the ravine.

It may be added that since the construction of a new asphalted highway from La Oroya to Tarma, the number of lorries carrying fruit to the Peruvian capital which pass the scene of the collapse is constantly on the increase. The weight and vibration of these vehicles may have provided the trigger mechanism which led to the creation of this unusual karstic feature.

J. Colin Crossley.

Leicester.



CAVERN COLLAPSE IN THE PERUVIAN ANDES NEAR OROYA