can be seen by comparing the position of the county boundary with that of the present main stream on the 6-inch Ordnance map. Mr. Smith's account of the struggles of the Trent to expand its valley has proved so interesting that I should like to see this line of research followed up in the case of other rivers, and a comparison made between rivers of different character as regards the work they are doing in altering their courses and shaping their valleys.

Mr. B. Smith: With regard to the remarks of Mr. Whitaker about documentary evidence, I know only too well that there is not too much reliance to be placed upon it, and have therefore only dealt in detail with those parts of the valley with which I am well acquainted. In reply to a question by Prof. Kendal as to the depth of the rock floor in the Lincoln gap; I do not think there is any difficulty about it. Although the surface of the latest valley gravels of the Trent is slightly higher than the surface of the present alluvium, their base is considerably below the base of the alluvium. At the very narrow gap near Clifton these latest gravels are below Ordnance datum. The fall from the Spaldford bank to Lincoln is considerable, so that it is not surprising to find the rock floor of the Lincoln gap 23 feet below Ordnance datum. There is no evidence in this area as to the warping of the lower course of the river; the fall in each set of gravels between Newark and Lincoln seems to be much the same throughout. In conclusion, I must thank the members of the department for the very kind way in which they have received this paper.

MUSIL'S EXPLORATIONS IN NORTHERN ARABIA, 1908-9.*

By his last journey—a toilsome and dangerous one—Alois Musil has removed from our maps the blank space which covered the whole large triangle between Arabia Petraea and Syria on the one hand, and Mesopotamia on the other. Leaving Vienna in the beginning of June, 1908, he arrived at Damascus on the 19th. Thence after long negotiations he succeeded in getting into communication with the powerful Sheikh of Northern Arabia, Nuri ebn Shalan. Then with his companion, Sergeant-Major Thomasberger, of the Military Geographical Institute of Vienna, three servants, and nineteen camels, he made his way in the middle of September to the camp of the sheik, whose travelling companion he then became. Thenceforth he either marched with the sheik or made lengthy excursions of his own from the camp. First and foremost, he measured out a base to the south-east of Dmeir, some 75 miles east of Damascus. Next, on October 11, he set off with five camels to the steppe regions in the north-east, and, passing hot springs, remains of Roman military stations, and the ruined town of Isarie, arrived at Resafe, 12 miles from the Euphrates. The ruins of churches and palaces in Resafe, with their inscriptions in Greek, Aramaic, and Arabic, proved of high interest for the history of art. This place marked the most northerly point of Musil's journey. Thence directing his course, first to the south-east and then to the south-west, he returned to the same spot by another way on November 2. During three more excursions of a like kind, but more extensive, the explorer made a plane-table survey of the whole region. The last excursion lasted from the end of March to the middle of April, 1909. In the intervals between these expeditions, he undertook shorter survey trips, or, proceeding further with the sheik's camp, secured ethnographic records. It sometimes happened that, returning from an excursion of his own, he would be a whole week in tracing his way back to the camp.

* Communicated by Dr. Karl Penninger.
Sketch Map
Showing explorations in
NORTHERN ARABIA
BY
Prof. Alois Musil.
1908–1909
Scale 1: 7,500,000

[Map of Northern Arabia with place names and geographical features]
These trips, it should be noted, were all carried out under incessant alarm from robber bands or hostile tribes. On his second excursion, which was directed eastwards, Musil was stabbed in the back by a lance and in the breast by a knife, while with his attendants he was stripped of everything down to his shirt. It was only his familiarity with language and manners, and the friendly relations he had established on former journeys, that got him out of this and similar awkward predicaments. He suffered also at the hands of thievish guides, whilst even worse difficulties were caused by the climate and by the badness of the drinking-water, which more than once laid him on a bed of sickness. He passed nights in the open when the temperature varied from 8° to 23° Fahr., and these would be followed by days with an air-temperature of 115° Fahr. Early on December 10, as told by him in a preliminary report to the Vienna Academy of Sciences, he had difficulty in adjusting his headcloth and blanket, so hard were they frozen, while his men hardly dared take hold of the water-bottles for fear of their breaking. After sunrise they warmed them by the fire; for to have kindled a fire earlier might have exposed the party to attack. On the third excursion, which, starting in the south-west part of the region under examination, proceeded southwards, it was with great difficulty that he found a guide. Nobody was willing to accompany him on these “Death paths” which, following on a ride through the desolate black desert of el-Bseita, led into the defiles of the westerly arm of the sandy desert of Nefud. On this excursion Musil pushed as far as the most southerly point of Jebel el Ghanem (27° 50' N.), where lies the old Nabatean Necropolis of el-Maiyene. The fourth excursion led him to the eastern and central parts. There, in the hot parched land of el-Hejera, further march was rendered possible only by carrying water in a linen waterproof cover tied to two saddle-bags and carefully guarded by Musil himself. Water-bottles were inadequate to the purpose. Here, in the mountainous land round Jebel Anaza, a peak renowned in fable, they suffered much from cold snowdrifts. On the watershed to the south of Anaza, there is in the Hamad next to no valley-formation, and, throughout an area 220 miles long by 250 miles broad, there was nowhere a single spring nor any standing water.

On April 12 Musil crossed what he describes as the dreadful spurs of the Harra, looking like fortifications and overtopped by extinct craters. May saw him again with the sheikh in the west, engaged mostly in ethnographic labours. In the middle of June he again visited, for the study of its inscriptions, the Khalif's castle of Amra, made known by him on a former journey. On the 19th, with his caravan he bade good-bye to Sheikh Nuri, and by the middle of July the explorer was once more in Vienna. The results of his travels are to be gathered up in the following separate publications, which will contain much matter of geographical interest:—

1. Additions to the map of Arabia Petraea in the north-east and south-east.
2. Map of Northern Arabia, embracing the region from 37° to 44° E. long. and from 36° to 27° N. lat. This will extend to the Euphrates.
3. Topographical report with exact description of the whole area explored, accompanied by many plans, sketches, and photographs.
4. Ethnographical report including an enumeration of all the nomads who have their camping-grounds in Northern Arabia, as well as an ethnographic description of the one remaining representative of the old Arab stock, the tribe of the Rwala.

5-8. Reports on natural history, inscriptions, linguistics, and other subjects.