Recent Work at Stonehenge.

By Lieut.-Col. WILLIAM HAWLEY.

CONSIDERABLE progress has been made during the last two years in the work of excavation which is being carried out at the site of Stonehenge, and although nothing giving any clue to the age and purpose of the monument has yet been discovered, many places in the area surrounding it have yielded matter of much interest and importance.

In order to find out the conditions of the Avenue and its relation to the place, an excavation of the ditch around the circular rampart was begun about 40 feet from where it would approach the south bank of the Avenue. The ditch was 6 feet deep where digging began, suddenly rising soon afterwards to a level 3 feet higher, but gradually returning to nearly the former depth as it went onwards. When the line of the Avenue bank was reached, there was no trace of it meeting the ditch, which passed on for about 25 feet beyond the spot and ended against a very upright bank of solid chalk about 5 feet high, widening and taking a roughly circular form with a flat bottom. An excavation, in the line of the ditch, made about 50 feet beyond this obstruction revealed a similar solid side. The intervening portion, which was 40 feet wide, proved to be a causeway of natural chalk which crossed the ditch and afforded an entrance to the circular enclosure. The ending of the ditch on the west was roughly circular like that on the east side, but here it formed a large wide pit 7½ feet deep communicating with another beyond it through a narrow opening. Both bore traces of fires at the bottom, and scattered around them were horn picks, bones of animals, and quantities of flint flakes.

The surface of the causeway was very remarkable as it was studded with 58 holes, more or less in regular lines, occupying the entire length and width of it. These were probably of the same age as the ditch, and with it seem to have been for defence and resisting combined attack, pointing to the place in its early history being one of defence.

In the entrance and in line with the rampart crest a large stone hole was found close to another previously excavated, the latter being the one the "Slaughter" stone is thought to have stood in.

Excavation afterwards included the portion of the Avenue between the entrance and the fence at the high road. The small side banks and ditches of it begin 10 feet from the main ditch, showing that the Avenue was independent of it and probably of later construction. Formerly it was believed that the Avenue entered Stonehenge, but it is now seen that the actual entrance was over the causeway, mentioned above, and only about half as wide. The Avenue is 70 feet wide where it begins, but the ditches are irregular in their alignment, carelessly dug, and of a variable depth of about 3 feet.

The ditches have a layer of silt upon the bottom, reaching half-way up, which contains nothing of the Stonehenge period, but the stratum over it does, so it might be inferred from this that the Avenue preceded Stonehenge by a considerable interval. Evidence of the Stonehenge period is gained from a stratum which varies from an inch or two to 15 inches in depth and is distributed with very fair evenness over the whole surface of the place. It contains the mason's chips and things that belong to and after that period alone, and therefore is a most useful guide for determining periods which precede and those which follow after the making of the monument, helping also to show that it is of Neolithic age. It has been necessary to make this digression in order that the context may be more clearly understood.

There were two large holes found near the Helestone, and there can be little doubt that they once held stones, and their filling of loose chalk was that which fell back when they were extracted. Over one of them there was a dump of nearly four thousand sarsen chippings and sandy debris, showing that a stone had been dressed on the spot, and no doubt taken from the hole and, after preparation, used for the monument. It seems from this that there may have been a certain number of rough sarsens already *in situ* here before Stonehenge was built. Each of the stones was 40 feet from the Helestone and suggest that a little group might have stood there independently of anything that might have been standing within the circle at the time.

A trench 4 feet wide was found around the Helestone, but only a part was excavated, as the remainder is covered by the high road. Like the small ditches, it had been half filled with silt, which had chips in the filling over it, but not in it, thus showing an earlier origin than Stonehenge.

Three large post holes occurred westward from the Helestone, with distances equally divided. They resembled those on the causeway and were certainly of early date, as the Avenue bank on the west covered two of them. The remainder of the Avenue was quite barren of anything of interest and had been much eroded by a medieval coach road and country traffic.

Excavation was afterwards transferred to the interior of the circular enclosure, and a systematic search began of the land within by cutting trenches in close succession over it from the rampart nearly up to the standing stones. Last year 107 trenches were opened and the N.E. quadrant accounted for, and this year it is hoped to complete the S.E. quadrant. The trenches were mostly over shallow ground and, on the whole, not very productive, but some of them certainly afforded places giving much information and interest.

The first line of trenches was directed towards the entrance at the standing stones, and, after proceeding a little way, holes were come to of a sharply cut, rectangular, oblong form, measuring about 5 feet long by 3 feet wide at the top, tapering in a wedge shape to a narrow bottom. These were found to extend in a regular succession in two rows around the outer circle, the holes of each new circle being exactly opposite standing stones. It was afterwards ascertained by sounding that similar cavities exist around the present outer circle, indicating that there were once two extra circles to the monument. For the sake of reference they have been called Y and Z circles. The first holes of the former began at 38 feet from the standing stones, and the latter 10 feet distant. Their side intervals are

regular but they are not concentric with the standing circle nor in relation to themselves. The distance from the outer circle gradually diminishes from where they begin at the entrance until No. 8 is reached, after which they take up the original distance; this applies to both circles. Some confusion was noted where the irregularities terminated; No. 7 hole had been only partly dug, and Z8 was found not to exist.

It can be clearly proved that these holes were made in the Stonehenge period, because the mason's chips were present in the filling and even upon the bottom. The first four holes excavated occur in the fairway from the entrance, and it may be safely said that they never held stones. Although dug for the purpose, consideration afterwards led them to leave the holes empty, as the stones would have been inconvenient in the fairway. Their sharpness and undisturbed condition showed there had been no insertion and extraction of stones; moreover, one of them contained five stag antlers and another a single antler, showing absence of stones. The other holes showed disturbances caused by extracting stones. Soil had fallen back, partly filling the holes, and over it was a more recent stratum bearing objects from the time of extraction to the present day. Romano-British objects were found in the upper stratum, and in one hole, about 18 to 20 inches from the top, there was dirty soil mixed with wood ashes and some natural flints arranged apparently as a temporary hearth, and on the same level were 42 pieces of a Romano-British pot. A little below this level were three pieces of fine, gritty pottery belonging to the "La Tene" period. This gives the impression that the stone was extracted at that time, and that spoliation on the site might have begun at quite an early date.

Where the irregularity occurred at No. 8, a considerable area was opened out to try to discover a reason for it, but with not much success. A great many post holes were met with, and, since then, a still greater number have been found extending from this spot towards the rampart, some of them taking the form of parallel lines; these are now in course of investigation. They are evidently of quite early date, as the Stonehenge stratum passes over them and they contain nothing of that period. Eleven of them, about 6 feet apart, formed a long row, the last two holes at one end having been united by digging to form a grave at a time when posts no longer stood there, the holes and loose matter affording less trouble in digging one. A skeleton found in it proved to be that of a person belonging to a long-headed race existing shortly before the Roman occupation. Owing to insufficient length and capacity of the grave (barely 3 feet deep) the remains were much crushed, but have nevertheless been reconstructed.

Remains of the Bronze age do not occur until after the erection of Stonehenge and are found in the upper stratum consisting chiefly of foot-worn fragments of pottery. With a cremation of that period there was found a beautifully ground and polished mace head of the "cushion" type. The stone is hornblendic gneiss and probably came from Brittany. Eight other specimens are known to exist of that type, now in collections, five of them coming from Scotland and three from the Thames and its neighbourhood, and they are regarded as ceremonial maces of that period. With another cremation a very fine bone pin 7 inches long was found. It had been burnt with the body and was much twisted by heat and broken in three places, but was easily mended. The cremated remains are usually found but a short distance below ground, most of them actually without cists in the loose chalk rubble at the foot of the rampart; sometimes the remains are found clinging to a turf when it is cut and turned over. This shows that the rampart conditions cannot have been very different then from what we see them now. The impression created during the continuance of excavation here makes one aware that a long succession of events is being dealt with which have covered a vast number of years. The silting of the main ditch alone is a proof of this. This process must have taken a very long time, for sometimes there are 6 feet of it and not a vestige of the Stonehenge era occurs in it, and is only met with as a narrow stratum below the turf and abruptly divided from it. Unfortunately, none of these matters have as yet given any information as to the date of the monument, but there is yet a great deal of ground to be opened, and by more time and diligent search it is hoped eventually to arrive at some clear conclusions.

Circumnavigation of the Earth by Aeroplane.

ON April 6, four U.S.A. aeroplanes left Seattle on an air voyage of circumnavigation of the world. Five months later, on September 6, two out of the four arrived at Boston. Flying took place on 48 days out of 153 days thus consumed. The actual flying hours were 288; the distance covered was 21,500 miles. About every third day on the average was therefore a flying day of 6 hours flying at 75 miles per hour, giving a flying day's run of 450 miles.

The flight falls naturally into four stages, floats being fitted for stages 1 and 3, wheels for 2 and 4. New engines were fitted at the start, and in Japan, at Calcutta, and at Hull. New wings were fitted at Calcutta, and numerous subsidiary repairs and replacements were carried out. Cruisers, supply ships, and flotillas of destroyers were employed in the improvised organisation along the sea routes. Existing permanent organisations were available along the land routes.

In stage 1 the route runs along the Pacific Coast of Canada and Alaska, and crosses the northern entrance of the Pacific Ocean by the Aleutian Islands; thence it runs by Kamchatka and Japan round the Chinese and Burmese coast to Calcutta. The Aleutian Islands, in which aeroplane No. 1 fell out, are subject to fogs, squalls and blizzards, the Chinese seas to typhoons, and the southern arc, Saigon—Rangoon, to tropical heats. There is no permanent airway organisation in the first part of this stage, and in the second part the Japanese, French and British organisations are not continuous. In this stage as a whole, flying took place only on 22 days out of 82, 11,000 miles being covered in 158 flying hours.

At Calcutta 4 days were spent in fitting new engines, new wings, and wheels for the overland stage Calcutta—