

embedded trunks of pines of the same species drifted down during freshets. Such deposits would be most frequent at the upper ends of the lakes, but a few would occur on either bank not far from the shore, where torrents once entered, agreeing in geographical position with the lignite formations of Utznach and Dürnten.

There are other freshwater formations with lignite, besides those on the lake of Zurich, as those of Wetzikon, near the Pfaffikon Lake, of Kaltbrunnen, of Buchberg, and that of Morschweil between St. Gall and Rorschach, but none probably older than the Dürnten beds. Like the buried forest of Cromer (p. 214), they are all pre-glacial, yet they by no means represent the older nor even the newer pliocene period, but rather the beginning of the post-pliocene. It is therefore true, as Professor Ramsay remarks, that, as yet, no strata 'of the age of the English Crag' have been detected in any Alpine valley. In other words, there are no freshwater formations yet known corresponding in date to the pliocene beds of the upper Val d'Arno, above Florence—a fact from which we may infer (though with diffidence, as the inference is based on negative evidence), that, although the great Alpine valleys were eroded in pliocene times, the lake-basins were, nevertheless, of post-pliocene date—some of them formed before, others during, the glacial epoch.

6thly. In what manner, then, did the great lake basins originate if they were not hollowed out by ice? My answer is, they are all due to unequal movements of upheaval and subsidence. We have already seen that the buried forest of Cromer, which, by its organic contents, seems clearly to be of the same age as the lignite of Dürnten, was pre-glacial, and that it has undergone a great oscillation of level (about 500 feet in both directions, see p. 227) since its origin, having first sunk to that extent below the sea, and then been raised up again to the sea-level. In the countless post-