December, there were three. From 10 to 12 work trains were employed in removing the earth to the embankments under construction concurrently near the Humber end. The work at Dowling Ave, as it appeared June 18, 1911, is shown in fig. 3. It will be noticed that two levels had been partially put down. This illustration also shows the method of working to these levels, that on the left being the first to be lowered, followed by that in the centre, which will extend over the left portion, and finally lower these two levels to the proper depth. The temporary tracks on the embankment at the extreme right meanwhile divert the regular traffic.

Last autumn the double track cutting ment. The most interesting point shown in this illustration is the method of carrying the gas main temporarily across the excavation. A cable, carried on posts on each side of the bridge, supports at intervals the elevated pipe line. The clean-cut appearance of the slope as it will finally appear on completion, is well shown in this illustration by referring to the appearance of the right-hand embankment. This slope will later be covered with turf.

With the exception of that portion of the cutting along the face of the exhibition grounds, which section is shown in fig 6, the whole cutting has sloping earth embankments, battered 1½ to 1. At the exhibition grounds, however, the east, the northerly end coming out at the junction of King and Queen Sts. Forming part of this scheme, the roadway to the right in this illustration, is to be moved further in that direction, long approaches leading the roadway up to the bridge. As will be noticed to the right of the present highway, a trestle alongside of the road carries tracks leading from the cuttings further along, from which the work trains discharge their loads for building up the roadway approaches to the new bridge. The approach leads in a straight line to an abutment at the proper elevation, from which point the bridge curves off to the left over the tracks to the beforementioned point. The portion of the

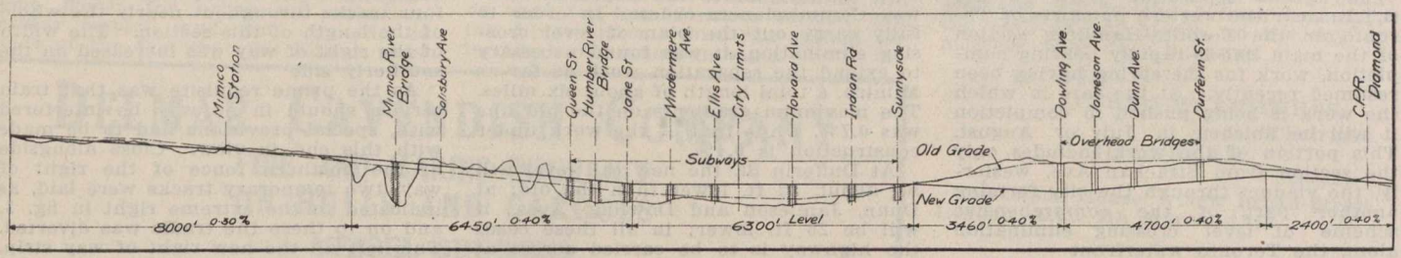

Fig. 2. Profile of G.T.R. Grade Separation Zone from Strachan Avenue, Toronto, to Mimico.

having been depressed to the required depth, the traffic from the upper temporary tracks was again diverted, this time on to tracks laid permanently at the bottom of the cut, as shown to the left in fig. 1, which is a view looking west towards Sunnyside from the temporary Dowling Ave. bridge. Work then proceeded on the depressing of the northerly half of the right of way, which is also to be seen in fig. 1. This shows the method of performing the work and illustrates the manner in which it was pushed, the two shovels working right up to each other, and

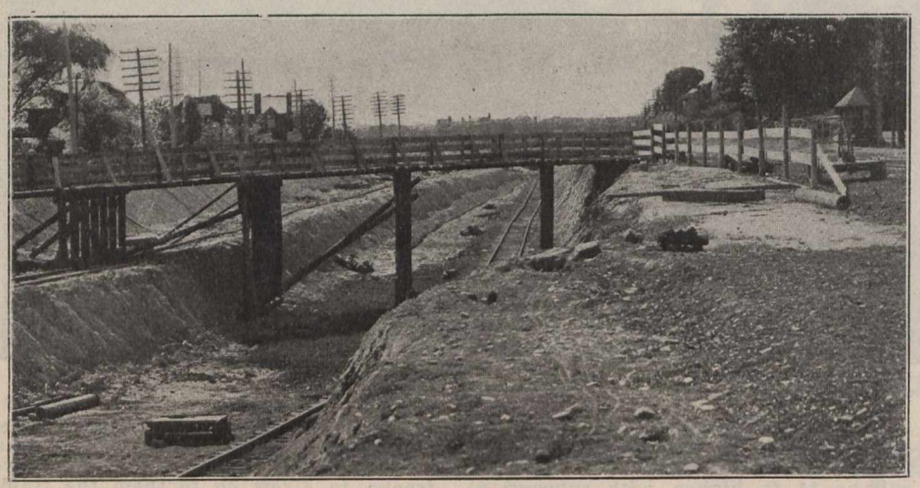

Fig. 3. Looking West, at Dowling Avenue, June 18, 1911.

fighting, so to speak, for the last shovelful.

Fig. 4 shows the same spot as that in fig. 1, and was taken at the same time, Dec 1, 1911, from a point a little further east. It illustrates the type of temporary bridge used to carry highways across the cutting while operations were in progress. A finished abutment for the final bridge is also shown. It will be noticed on the date mentioned, which was shortly previous to the suspension of work for the winter, the second pair of tracks had been nearly lowered to their final position, leaving but little excavation work to be carried on this spring.

The semi-finished cutting, looking east across Dunn Ave., on the same date, is shown in fig. 5. This also shows the temporary bridge, completed south side embankment and bridge abutimpossibility of procuring sufficient ground to give a sloping embankment, made necessary the use of a retaining wall, constructed of reinforced concrete of the form indicated. Some of the top moulds in place, with the method of raising the concrete by elevator, are shown in this illustration. The bridge abutment in the foreground is that for the Dufferin St. bridge, leading into the exhibition grounds, and in consequence is to be made larger and more elaborate than the balance of the overhead bridges through this South Parkdale district. A more simple method of carrying the gas main across is here shown. The easterly limit of the cutting is also shown in the distance. The portion shown is the only part of the cutting to have a retaining wall.

The westerly end of the long cutting skirts the edge of the lake, as may be noticed in the distance in fig. 7. In fact, part of this work only required the reduction of the face of the cliff above the shore, the major portion of the additional right of way being obtained by building outward over the shore.

Sunnyside, the point of division between the elevation and depression of the tracks, is to have an overhead bridge with long approaches. In fig. 7, a view looking easterly across Sunnyside, shows the present level crossing of the highway on the left The roadway for the new bridge is to be diverted so as to cross the tracks some distance further right of way in the immediate foreground in fig. 7 has not as yet been altered. When the highway is diverted to its final location on the right, the railway right of way will extend over the present position of the highway.

From Sunnyside to Mimico there is one long embankment. Previous to this change in grades, there was a small double track embankment from Sunnyside to the Humber River. The first operation, therefore, was to extend the embankment sufficiently northward to receive two tracks on the same level, on which temporary tracks were laid to carry the diverted traffic With the exception of a short portion near Swansea, the elevated track is on an embankment. At the point mentioned, owing to the presence of buildings to the north cramping the right of way over towards the roadway, a concrete retaining wall of full height was required. Behind this wall and along this roadbed from Sunnyside to the Humber, the old embankment was raised by the excavated material from the easterly end of the work. This filling work was accomplished by means of a temporary trestle raised to the required height over the roadbed

At the Humber, a new four-track deck plate girder bridge, having 2 spans, was built, 100 ft. each. While this bridge was under construction the two main lines from the high level on either side of the Humber were carried across on the old truss immediately north of the new bridge by means of ramps.

Near Sunnyside, as mentioned before, and as illustrated in fig. 7, the two northerly tracks alone have been elevated in anticipation of the use of the present highway for part of the roadbed when the highway is diverted to its ultimate location. Fig. 8 shows how the southerly ends of the subway abutments have been left for final completion when the property for the completion of the two final tracks at this point is available. This illustration also shows the way in which the elevated tracks were temporarily carried across the highways before the steel bridges were finally placed. The manner of performing this latter operation and the type of subway bridge used are shown in fig. 9.

This work is under the charge of J. R. W. Ambrose, Assistant Engineer, and D. McCooe, Superintendent of Grade Separation.

Other illustrations in connection with this grade separation work, will be found on pages 213, 214 and 215.