

Now that settlement has extended over all the available land it becomes a serious matter when a river threatens to change its course.

It appears that about 1871 the Orari River overflowed its banks and threatened all the land lying to the south of its present course between the railway and the sea as far from the river as the high ground along the Winchester Beach Road. The occupiers of this land had the district constituted as the South Orari River District in 1872, raised money and carried out remedial measures, which were so far successful that the river has ever since remained in its proper channel. Unfortunately, for some years past this Board has levied no rates, and entirely discontinued the work of maintenance.

In 1902 the river again overflowed its banks, this time just below the road-bridge, six miles above the railway, and flowed into the Waihi River and thence into the Hachaetemoana, severely flooding the Town of Temuka and the country between it and the point of overflow for a width of from two to three miles. This flooded and threatened district was promptly formed into the Upper Orari River District in 1903, and the Board erected defences, and since then has suffered no damage from the river.

More recently the river showed an inclination to break over about two miles above the railway, and protective works have just been erected there.

It is impossible now to say how much of the past immunity from damage has been due to the works erected, and how much to the absence of exceptional floods and the passing-away of the waves of shingle (previously referred to), which probably largely contributed to the overflow in the first instance.

Local government in the district is rather involved. The whole is included within the boundaries of the Geraldine County Council. The County Council, however, does practically nothing beyond maintaining the bridges which are over 30 ft. in length. The control of the county affairs is divided between three Road Boards, two River Boards, and the County Council. None of these local bodies employs an engineer, and there appears to have always been a diversity of opinion amongst the various authorities as to where the responsibilities of one began and another ended. In the absence of expert engineering advice the local authorities have failed to realize the importance of proper maintenance, and of making all work conform to a comprehensive scheme.

Probably over twenty years ago the value of willows for protective work began to be realized, and when local erosion threatened or had taken place willows were planted sometimes successfully, sometimes not. As they grew they were cut, and frequently (by the careless or ignorant) thrown into the river. These cuttings, and also whole trees which were torn out by the further erosion of the river-banks, were carried down by the floods and deposited wherever an obstruction occurred, and particularly where the current slackened in the lower reaches. They immediately took root and spread; shingle and silt deposited around them through which they continued to grow, thus constantly and in some instances rapidly raising the bed of the river beyond the other causes outlined above. The willows coming down from above have been attributed by the lower owners to different persons or local bodies, and owing to everybody disclaiming responsibility the willows were not removed. The proper channel being blocked or excessively raised, the river naturally flows to the side and erodes the same. This has repeatedly happened, and the individual settlers and sometimes the local authorities have attempted protective works, but without removing the cause, consequently these efforts have not always been successful.

Another fruitful cause of trouble has been the action of the Government in leasing the beds of the streams and thus practically permitting lessees to fence across the stream (otherwise their leases would be valueless). These fences were frequently constructed with willow posts and stakes, which grew, and have in places formed an almost impenetrable barrier across the river-bed, forcing the streams elsewhere. This latter applies more especially to the Waihi Stream. The Orari, being the fiercer river, has been generally beyond the resources of the individual owners, and consequently has been able to greatly widen its bed by erosion of the original banks. This has resulted in furnishing a wider field for the growth of willows, has caused the stream to be shallower, and consequently of lower velocity, and has permitted the deposit of still more shingle.

It will be seen from this that the trouble, unless soon coped with vigorously, tends to become aggravated in a constantly increasing ratio.

Some of the interested parties made a point of the fact that no shingle now reaches the lagoon at the mouth of the Orari. But I doubt if much, if any, ever did. By the time the detritus reaches the sea it is reduced by natural attrition to sand or very small shingle. The grade in the lower reaches is too flat to allow of any but fine material reaching the lagoon. If more shingle is being delivered from the hills than can be ground up by the river before it reaches the sea, then the inevitable result must be the raising of the bed until a uniform grade sufficiently steep to enable the water to carry shingle is formed from the hills to the sea. This need not be greatly feared for many years.

On the Waihi River, the actual fine-weather channel growing steadily smaller as it approached its mouth, the land when subdivided for settlement was pegged up to the edge of this constantly narrowing channel.

The settlers, in order to preserve their land from erosion, planted thick willow fences along their boundaries, and in places I believe even encroached on the already too narrow waterway. These fences, even had they been kept within control, from their too close proximity to one another must have resulted in the flooding of the land unless very high and secure banks had been constructed—which was not the case. Lately the position has become so acute that the Upper Orari River Board, acting under the authority of clause 7 of the Land Drainage Amendment Act, 1913, has served notices on a number of occupiers adjoining the Waihi River, calling upon them to clear out all obstructions, whether willows, gravel, or material of any kind, from the centre of the bed of the river to a line 10 ft. back from the banks. When only one occupier complied with the notice the Board instituted legal proceedings against those objecting, and when I visited the district the cases were still *sub judice*.

It seems to me that it will be very difficult to compel occupiers to carry out clearing-work at their individual expense which will be of benefit to the land below over a considerable area,