

43. That I am not an unreasonable prognosticator of evil, I beg to append the remarks of a late intelligent writer on California; and may here add that the cases may not be entirely parallel, yet the warning is of sufficient importance to call for the timely offices of our legislators and engineers.

44. To gain an intelligible view of the effects of the upper valley being filled with gravel, &c., we will require to consider the fall of the river from the Maniototo Lake to the Taieri Plain. This has been stated before to be 962 feet in fifty miles, or at the rate of 19.25 feet per mile, the descent being pretty uniform. This is a far greater rate of descent than is applicable to the "absolute torrents" of English hydraulic engineers, whose velocities are reckoned at 480 feet or more per minute. Now, as a current of 180 feet per minute scours angular stones as large as an egg, and a rate of 300 feet scours conglomerate, the Taieri in flood will bring down tailings of every size and description to the lower levels.

45. If, then, the interior gold fields are to be prosperous and extend, measures will require to be energetically taken in the agricultural district of the Taieri to deal with these tailings.

46. It is true that a generation may yet pass away before they become absolutely obnoxious to tillage, yet, under the above circumstances, the event is certain, and the action will be continuous till the gold fields are worked out.

47. With these facts before us, then, we must neglect the limited interest for the large majority --the inconvenience of a few for the safety of the whole.

48. The proper engineering measure for dealing with the floods of the river is, therefore, the second one mentioned—namely, to confine its channel entirely to the west side of the Plain, cutting it off by a strong and high embankment from the fertile fields of the central and eastern districts. This would be a measure adequate to the wants of centuries; any other would be ineffective and temporary.

I have, &c.,

J. T. THOMSON,
Civil Engineer.

The Secretary for Land and Works, Dunedin.

APPENDIX.

The Foot Hills—Gold Mining.

It is a sad pity to see the beautiful rivers of California so spoiled by the gold-washings from above.

The Sacramento is yellow with the sand from these works in the mountains, and the fine salmon which used to fill its streams are being driven away each year. In a short time, unless efficient measures are taken to preserve the fish, the rivers of the State will be stripped of a most valuable product, as similar streams have been in New England.

The sea fish of San Francisco, however, are abundant, and of many new and remarkably fine varieties.

The mining in the Foot Hills is producing another remarkable effect: it is driving out the farmers from the river bottoms to the elevated land. These flats were always subject to periodical overflows, but, as the floods seldom reached beyond a well-known limit, and as they deposited fertilizing sediment, the cultivators could adapt themselves to them and found their advantage in them. But since the enormous hydraulic washings in the Foot Hills, or the Sierras, this has all been changed on account of the filling up of the mountain streams with gravel and soil. In many of these streams whole hills have been sluiced away, and have filled up the rivers from twenty to forty feet. When the winter-floods come, they pour down these channels and carry the soil and gravel to the valley streams, filling them up to the brim, causing floods, and thus burying thousands of acres of most valuable land every year under this sandy and pebbly deposit. I heard of one instance in Yuba County of an orchard of seventy-five acres worth from \$50,000 to \$75,000 thus completely destroyed, and of many similar cases of smaller vineyards and farms.

The following from the *Alta* newspaper will illustrate this destructive action of man on nature:—"Marysville, once the best-built and neatest inland town of our state, with a flourishing commerce, has been retrograding for some years past, from changes incident to California. The best-paying orchard of the State was Briggs'. This consisted of ninety acres of assorted fruit trees, on rich, sandy loam, kept moist by infiltration from the river. The fruit of this orchard was the earliest to reach the market, and, until prices fell to their present level, it paid well to send it to San Francisco, even at heavy cost of steamboat freight. What has become of this celebrated orchard, which was valued at \$200,000? It is now a willow copse! Its trees, which were so beautiful and so fragrant in full flower of spring time, and whose rich show of fruit, always heavily laden, was the greatest attraction on the highway, now gladden the eye no more for ever. In its place stands a wilderness of rank willows, overtopping its former wealth of fruit trees, and blotting out the record of their history."

Dr. Tregarden's rich and beautiful orchard of forty acres, in nearer proximity to town, has shared the same fate, and Briggs' second orchard of 200 acres is fast following it. Nearly all that exceedingly fertile bottom land that lined the banks of the Yuba for miles above is also for ever blotted out, and the work of devastation still advances along the bottoms of the Feather River, below the confluence of the Yuba. In time not distant, the whole of those rich dark soil bottom lands will be one barren waste of sand.

This sad change is but a type of the utter desolation that has already ruined the bottom lands everywhere along the streams that come from the gold mines.

Every year millions of tons of earth, gravel, and sand are sent down the rivers that go from the mines toward the plains below. Every year there is added so much to the channels of deposition that the beds of the streams are elevated, and their waters spread more and more over the alluvial bottom-lands, and bury them under barren sands beyond redemption.