

and having less spread over shingle beds. It will not probably fall below 41° in July and August near the sources, and not rise above 61° during the summer near the mouth.

4. *The Ngarurora* rises in the Ruahine Ranges, has a course of about sixty-five miles over large boulders; the first twenty-five miles confined principally between high headlands. From the spurs of Ruahine to the head of the Ahuriri Plains, a distance of about twenty-two miles, the river runs in different channels over a shingle bed, averaging twenty chains in width, with an average fall of about fifteen feet per mile; the last eighteen miles through the Ahuriri Plains. The river is confined between high alluvial banks, which it very rarely, and on few spots only, overflows. Its average fall, to within three miles of the sea is about four feet per mile, with light shingle bottom. The last three miles are under tidal influence with a hard clay bottom. The mouth has a shifting bar with rarely less than two feet at low water. The depth of the river to three miles from the mouth, averages about seven feet, whence it decreases to about four feet to the head of the Ahuriri Plains, with but very few fords of two feet. From the head of the plains to the spurs of the Ruahine, the river runs in shingle channels, having in the summer season at least fifteen inches of water. Higher up the river, its tributaries assume the character of mountain gorges, over large sandstone boulders. The river is fed partly from snow water during June to November. The range of temperature will probably be between 36° in August and September in the ranges, and 62° in February at the head of the plains, where it spreads over a large shingle bed. The Ngarurora appears to be well adapted for salmon.

5. *The Mohaka* and its principal tributaries have their rise in the Ruahine and Kaweka Ranges. Its course is about eighty-five miles, and it is the largest of the rivers in Hawke's Bay. It runs for the greater part of its length between high and partly wooded ranges, which it only clears within a few miles of its mouth. For the first fifty miles it runs over a boulder-bed, and thence over shingle to its mouth. The banks are generally high and precipitous, and but very little subject to encroachments. The depth of the river, for sixty miles from its mouth upwards, is very rarely under two feet during the summer season, with the exception of a few rapids in the middle of its course. The Mohaka being fed for nearly six months by snow from the ranges, and being confined for the greater part of its course between high hills, its temperature is lower than that of any other river in Hawke's Bay, and will probably range between 59° near its mouth in February, and 37° near its source in July and August. It has a bar mouth, with frequently only one foot of water at ebb tide. The Mohaka appears well adapted for salmon, and is singularly free from eels, the great enemy of the young, owing to the absence of swamps within its drainage area.

Memo.—The instrumental observations of temperature having extended over little more than one month, I have been compelled to supplement them for the different seasons, with estimates based upon impressions obtained through the last nine years, while my duties connected with the road and survey departments have led me constantly over the different portions of the Province.

My observations induce me to consider Hawke's Bay and its rivers well suited for salmon, as the head-waters of nearly all the rivers are sufficiently deep, cool, and well shaded for spawning, especially the Ngarurora and Mohaka, and as the estuary of the Tutakuri and the Petane Rivers is a shallow, land-locked tidal basin, of twelve square miles, known as the Ahuriri Lake, well adapted for the young fry.

The only drawback to the successful development of the young fry seems to be the large number of eels which frequent the rivers and estuaries from the adjacent swamps, but those even have decreased gradually of late, and must necessarily decrease daily with the drying up and draining of the swamps, which is rapidly taking place.

The heads of all rivers, especially the Mohaka and Ngarurora, are so cool and rapid that eels are not frequently met with there; in fact, the Natives say that they are very scarce even in the lower parts of the last-mentioned rivers, which for this reason are perhaps the best suited for experiments.

6. *Hamilton, Upper Waikato.*—Observations taken by W. M. McCol, Armed Constabulary.

7. *Port Waikato.*—Observations by H. H. Fenton.

Memo.—The range under "temperature of air" may be taken as rather higher than most other localities, owing to the protection of a high range of hills from the cold and prevailing winds. The salt water, at the highest spring tides, never flows higher than six miles above this.

HAROLD HYDE FENTON,
Port Waikato.

8, 9, 10. Names of the observers not given. No notes.

11. *River Avon, Canterbury.*—The observations on the temperature of this river were taken by R. L. Holmes, Meteorological Observer.

Extract from Memoranda appended.

"The observations were taken in the City of Christchurch, about five miles from the estuary, where it is not influenced by the tide. The course of the river is about twelve or fourteen miles; it rises in large springs, and flows between well-defined banks, with an average velocity of three or four miles an hour. The bottom is in general muddy, but the water is beautifully clear, except after rainfall. There is a considerable quantity of swampy land in some parts of its course, and there are extensive mud flats in the estuary, where it joins the Heathcote River. It is frequented by eels, but in what quantity I cannot say. Observations continued for twelve months will show, I believe, a comparatively small range of temperature, owing to the nature of its rise and course.

"These remarks apply equally to the River Heathcote, which runs into the same estuary, except that up to the present time it has not, like the Avon, been occasionally flooded by an overflow from the Waimakariri during heavy floods."

12. Name of observer not given. No notes appended.

13. *Jacob's River, Southland.*—Observations taken by John Hall, Pilot, Riverton.