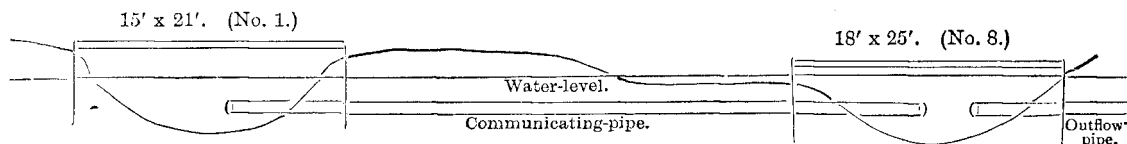


sketch, and give the total supply of hot water used in the baths, equivalent to about 25 gallons per minute, which runs to waste eighteen hours out of the twenty-four.



Difference of water-level in the two tanks, 18in. To increase the capacity of No. 8 by 1ft. in depth would give 765 cubic feet more water, or 4,688 gallons. To increase the capacity of No. 8 18in., both tanks would stand full, giving 7,032 gallons extra.

No. 7 is a circular pool some 25ft. in diameter, enclosed by a corrugated-iron fence, and used as a swimming-pool. Its temperature varies, usually about 80° Fahr., but sometimes cold. There are five dressing-boxes connected with it. No. 4 is a round open pool some 15ft. in diameter, also fenced in with corrugated iron. The water has a temperature of 83° Fahr., and is used for cooling the supply from Nos. 1 and 8. It is the only mineral water available for the purpose. Its outflow is not allowed to run to waste, but is drawn upon as required. The supply, however, is very limited, frequently failing in summer to yield the necessary daily quota of 4,500 gallons. In any future scheme of improvement this fact will require some consideration.

On the five-acre enclosure stand three buildings—the bath-keeper's house and two bathing-pavilions. The old pavilion contains four baths, each 9ft. by 2ft. 6in. Each bath is provided with a cold shower, and each will accommodate two bathers. The bottom of these baths is 5ft. below the surface, to allow the access of the water by gravitation. The new pavilion contains eight baths, also provided with cold showers; these baths are 6ft. by 2ft. Here screens are much needed, to prevent the shower-water from splashing over the room. In this pavilion there are two waiting-rooms—mere closets, ridiculously small, uncomfortable, and inadequate. The bath-keeper's house contains two bedrooms, a kitchen, and a sitting-room, but, as he is Postmaster of the district, his sitting-room is taken up by postal requirements, so that he is greatly cramped for room. The washing of towels, &c., is, of course, very considerable, and his wife very reasonably complains of having to wash out of doors in the cold winter weather. An outhouse is urgently needed.

The prevailing wind is from the north-west—a warm wind, which has the effect of cooling the springs slightly; but on the whole neither wind nor season make much difference either in temperature or outflow. In a non-volcanic district this is what might be reasonably expected, the springs rising most probably as natural artesian from a great depth. The south-west is the rainy quarter. The snow remains on the hills for eight months in the year. The earthquake which occurred on the 1st September, 1888, appears to have had no effect whatever on the springs, either as to chemical constitution, temperature, or outflow; neither was any injury done to the bath-buildings. The effect of the Tarawera eruption on the Rotorua Springs was to increase both their temperature and outflow—a most fortunate result, as such seismic disturbances not unfrequently cause the total disappearance of thermal springs.

The statistics of these baths for the last three years are as follows: Number of baths taken for the year ending 31st March, 1889, 4,277; year ending 31st March, 1890, 5,665; year ending 31st March, 1891, 6,433. Revenue for the three years respectively, £136 16s., £208 8s., and £228 12s. 6d. The money is paid into the Public Account, and the bath-keeper's salary is £200 per annum, of course, including his wife's services as female bath-attendant. Thus it appears that an annual increase of 20 per cent. may be expected for the next few years, whether additional accommodation is afforded or not. The charges for the baths are 1s. for a single bath, or twelve for 8s. Some complaint is made that these charges are too high for the poorer class of patients.

Let us next consider what amount of bathing-accommodation these springs are capable of affording. We have seen that the total supply of hot water from springs Nos. 1 and 8 is equal to 25 gallons per minute, or 36,000 gallons in twenty-four hours. There are twelve baths, which, reasonably filled—say, to a depth of 18in.—will draw upon the supply as follows: Eight baths, each 6ft. by 2ft. by 1ft. 6in. = 144 cubic feet; four baths, each 9ft. by 2ft. 6in. by 1ft. 6in. = 135 cubic feet: together, 279 cubic feet, or 1,709 gallons, required for one filling of the twelve baths. Say they are filled seven times daily, equal in round numbers to 12,000 gallons. The water from springs Nos. 1 and 8 will average a temperature of 115° Fahr. The temperature required for bathing is, say, 103° Fahr. The only water available for cooling is from spring No. 4, at a temperature of 83° Fahr. To obtain 12,000 gallons at a temperature of 103° Fahr. we require five-eighths of the quantity, or 7,500 gallons from springs Nos. 1 and 8, and three-eighths, or 4,500 gallons, from spring No. 4, thus: $115^{\circ} \text{ Fahr.} \times 5 = 575 + 83^{\circ} \text{ Fahr.} \times 3 = 824 \div 8 = 103^{\circ} \text{ Fahr.}$

The baths are used six hours daily; and we have calculated for their being filled seven times in that period. Are the springs equal to this demand? The six hours supply at 115° Fahr. is 9,000 gallons; but, unfortunately, the cooler water at 83° Fahr. frequently fails in the summer, causing trouble and delay; otherwise the hot supply, as it stands at present, without conservation, is sufficient for three more baths—say, 1,446 gallons, which *plus* 7,500 equals 8,946 out of the 9,000. Practically, the bath-keeper finds that seventy baths daily are as many as he can give under existing arrangements. This he attributes to three causes, two of which, at any rate, are remediable: (1) The use by bathers of an unreasonable quantity of water; (2) remaining in the bath an unreasonable time; and (3) the failure of the cooling-supply. We see, therefore, that at present thirty-five invalids only can be provided with two baths daily.

The hotel-accommodation last season was for fifty visitors, which proved quite inadequate to the demand. Next season the two hotels will accommodate seventy—Jollie's Pass Hotel, three miles from the springs, fifty; and Jack's Pass Hotel, a mile and a half from the springs, twenty. Both proprietors are prepared to increase their accommodation to meet the demand. Their terms are two guineas per week for visitors of the first class, and £1 5s. for second class, with free buggy twice daily to the springs.