

Lakes.

Constance, 1,306 feet; Biel or Bienne, 1,484 feet; Geneva, 1,231 feet; Lowerz, 1,534 feet; Neufchatel, 1,487 feet; Brienz, 1,711 feet; Luzern, 1,434 feet; Zug, 1,368 feet; Zurich, 1,342 feet; Lugano, 889 feet; Maggiore, 646 feet; Como, 699 feet.

List of Passes in Switzerland and New Zealand.

New Zealand.—Hector's Pass, 1,300 feet; Haast's Pass, 1,716 feet; Whitcombe's Pass, 4,212 feet; Browning's Pass, 4,325 feet; Arthur's Pass, 3,013 feet; Harper's Pass, 2,008 feet; Hurunui, 2,750 feet; Hope Saddle, 2,850 feet; Amuri, 3,170 feet; Ada (Cannibal) Gorge, 3,300 feet; Maling's Pass, 3,500 feet (?); Wairau-Clarence, 4,493 feet; Jollie's Pass, 2,826 feet; Hossack Saddle, 2,560 feet; Barefells, 4,363 feet; Ward's Pass, 3,792 feet; Saxton's Pass, 3,950 feet; Tarndale, 3,270 feet; Ward's (Wairoa) Pass, 2,400 feet (?); Riwaka-Takaka, 1,200 feet (?); Whangapeka, 3,000 feet (?); Inangahua, 1,127 feet; Maungatapu, 2,500 feet (?); Tophouse, Buller, 2,137 feet.

Switzerland.—Maloja, 5,941 feet; Lukmanier, 6,598 feet; Simplon, 6,593 feet; Bernina, 6,656 feet; St. Gotthard, 6,934 feet; Splügen, 6,943 feet; St. Bernardino, 7,016 feet; Grimsel, 7,134 feet; Julier, 7,401 feet; Albula, 7,586 feet; Gemmi, 7,650 feet; Furca, 7,990 feet; Nufenen, 8,006 feet; Gries, 8,023 feet; Fluela, 8,329 feet; Great St. Bernard, 8,853 feet; Stelvio, 9,174 feet; Scaletta, 8,570 feet.

Average height of 19 known passes in the South Island, 3,150 feet; average of 18 important Swiss passes, 7,504 feet. The same average is maintained over 60 passes, including all those most in use.

List of New Zealand Mountains (omitting the Southern Alps).

(From lithographed maps published by the Public Works and Survey Departments.)

Mount Franklin, 10,000 feet; Mount Aspiring, 9,940 feet; Mount Odin (Tapuaenuku), 9,700 feet; Mount Earnslaw, 9,170 feet; Mount Kaitarau, 8,700 feet; Mounts Castor and Pollux, 8,633 feet; Mount Edwards, 8,459 feet; Mount Llawrenny, 8,500 feet; Mount Christina, 8,475 feet; Mount Alba, 8,268 feet; Mount Tyndall, 8,118 feet; Mount Una, 8,000 feet (?); Mount Fairy Queen, 8,000 feet (?); Mount Alta, 7,833 feet; Glacier Dome, 7,810 feet; Mount Ben Nevis (O), 7,650 feet; Hector Mountains (Remarkables), 7,638 feet; Mount Larkins, 7,431 feet; Temple Peak, 7,064 feet; Mount Albert, 7,038 feet. Vertical angle between Wairau and Rainbow Ranges—Rainbow Peak (N),* 6,975 feet; Castle Mount, 6,872 feet; Pembroke Peak, 6,700 feet. Wairau Gorge—Gorge Peak (NCr),* 6,647 feet; St. Bathans, 6,600 feet; Eyre Peak, 6,530 feet; Buckland Peaks (N), 6,500 feet. Wairau Valley—Woolshed Peak (BN),* 6,452 feet; Tarndale Peak,* 6,356 feet; Moffat Peak, 6,349 feet; Kurow Peak, 6,293 feet; Trig. Station, Wairau (C'N),* 6,258 feet; Hawkdun, 6,225 feet; Trig. Station, Wairau (FN),* 6,191 feet; Mount Eglinton, 6,085 feet; Trig. Station, Wairau (ARn),* 6,049 feet; Mount Lyell, 6,039 feet; Mount Peel (N), 6,000 feet; Boundary Peak (N), 5,926 feet; Roughridge, 5,878 feet; Trig. Station (CN), 5,846 feet; Mount Arthur (N), 5,800 feet; Snowdon (N), 5,800 feet; Franklin Mountains, 5,740 feet; Trig. Station E (N), 5,734 feet; Spire Peak, 5,567 feet; Mount Ligar, 5,559 feet; Mary Peaks, 5,500 feet; Mount Rochfort, 5,572 feet.

APPENDIX B.

CIRCUITOUS ROUTES OF SOME ENGLISH LINES.

Eight great groups of railways do the services of England and its connection with Scotland. The first in the field were the London and North-Western, the Midland, the Great Western, South-Western, and Brighton. At the first the London and North-Western alone carried the whole northern traffic from London on the London and Birmingham section, itself practically direct. Rugby junction on that line was the point of union of the line for Crewe (at which place two arms diverged to Liverpool and Manchester), and of the Midland line, serving Leicestershire, Derbyshire, Yorkshire, Durham, Northumberland, and East Scotland. The original Liverpool line was practically direct. The Manchester line has been since shortened by about six miles by the North Staffordshire line taking up the pottery-towns. The original York, Newcastle, and Edinburgh route was, five years later, superseded, so far as York and the North is concerned, by the Great Northern, with which the Midland subsequently entered into competition by a direct line from London to Leicester. As the crow flies, York is 174 miles distant from London; the first railway service by Rugby was 210 miles long. The Great Northern reduced this length to 192 miles long, and the improved Midland route is a trifle longer. Yorkshire, Durham, Northumberland, and Edinburgh submitted for the time to a circuit of 36 miles upon 174.

The Great Western line to Bristol followed the Thames Valley, making a detour of 16 miles from the bee-line of 103 miles, in order to connections with Oxford, Cheltenham, Gloucester, Worcester, the western counties of England, and South Wales. A subsequent loop-line by Newbury and Devizes shortens the distance to Bristol by about ten miles, but is little used except for local traffic. The Exeter extension of this company was even more circuitous. The bee-line in this case is about 156 miles; the original railway route by Bristol and Taunton is 193 miles long, a detour of 37 miles on 157. The directest route was many years later constructed by the South-Western Company by way of Basingstoke, Salisbury, and Yeovil, length 166 miles. Both routes are indifferently used, the convenience of the London terminus for different parts of the metropolis appearing to weigh more in the choice of a route by through passengers to Exeter, Plymouth, and Cornwall than the length of the journey.

For many years the London and Portsmouth traffic submitted to a surprising detour. The bee-line is about 64 miles. The original South-Western Company's route by Basingstoke, Bishopstoke, and Farnham was 93 miles, a detour of 29 miles on 64. The competition of the London and Brighton Company has led to a directer route by Guildford and Petersfield, length 72 miles.

Even the pleasure-route to the Continent of Europe was for a very long time circuitous. The bee-line from London to Dover is about 66 miles. The route for between fifteen and twenty years

* Those marked with a star are close to the central route.