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First I have to apologize for the delay in presenting my last instalment. I have been ill for some time.

In this instalment we will look at the Gornergrat Railway from the point of view of economics and what this means for the further development of the company. Let us repeat again the line's main technical data:

Gornergrat - Monte Rosa - Bahnen	
Opened	1898
Length	9339 metres
Double tracked	3790 metres
Rack system	Abt
Curve radius	80m
Maximum incline	200%.
Average incline	160%.
Electrified with rotary current	3x725 V 50 Hz
Admissible maximum speeds:	Uphill 28 km/h Downhill 21 km/h
Difference in altitude Zermatt-Gornergrat	1485m or 4820 feet
Altitudes over sea level:	
ZERMATT	1604m
Findelbach	1770m
Riffelalp	2210m
Riffelboden	2348m
Riffelberg	2582m
Rotenboden	2819m
Gornergrat	3089m
Rolling stock:	
Bhe 2/4	12
Bhe 4/8	8
Bhe 4/4 + Bt	2
Locomotives He 2/2	3
Goods wagons	5
Rotary snowploughs	2
Transport capacity in persons	2400 per hour

Since the opening of the line the number of visitors wanting to enjoy the Matterhorn has steadily increased. Whereas in 1899 with summer operation only ca 34,000 persons used the railway, this number rose to ca 200,000 in 1950, 960,000 in 1960, 1,625,000 in 1970 and by 1990 to 3,300,000. Today 3.5 to 4 million guests each year ride the railway depending on weather and snow conditions.

The impact of these numbers on the economy of the region is considerable. A study made by the renowned economics department of St. Gallen University speaks of an average

200,000,000 Swiss Francs each year. Contrary to what one would believe it is not only the tourism industry which is profiting, but all other professions as well. Without the railway infrastructure of the BVZ and the Gornergratbahn, the income would be far less. The argument that without a railway a road would have been built is correct only in part. It is indeed possible to build a road to the Gornergrat, but it would be difficult to maintain it and to find sufficient room for the parking lots. Furthermore the use of the road would be quite problematic in winter.

To transport these visitors with a cable car line is far less efficient than the railway and even more costly. It is certainly possible to offer about the same transport capacity per hour but the investment in one line of more than 9 km length is huge. It would have to be built in sections each with its own cable drive mechanism. In times of low demand a cable line has to operate whether the owners like it or not. The image and prestige at stake is too valuable to shut down the cable line. In bad weather and wind the cable cars are forbidden to operate for safety reasons. The rack line, however, is able to reduce the number of trains to the minimum required or alternatively the same line can operate more trains when demand is high. On the Gornergrat line the instalment of a double track section has brought a welcome improvement in flexibility. Should the traffic rise still more then it is possible, albeit at the price of heavy investment, to double track the entire line. But first, the Bhe 2/4 single motor cars bought after World War II will be replaced by modern twin units as they are faster and offer considerably more room for passengers.

Obviously the rising traffic has caused investments of which the traveller sees not much or even nothing. The very dense traffic at peak times causes a much higher energy con-



A Gornergrat train pictured with the Matterhorn behind.

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sumption, so the entire current network had to be updated. In addition nine additional transformer stations had to be built. The passing loop at Findelbach was lengthened by about 50 metres, the depot at Zermatt by 125 metres. The Findelbach Bridge has been reinforced. Several galleries have been lengthened. These improvements cost huge sums. I am often reproached by visitors who say that our rack lines are excessively expensive to travel. We should bear in mind that maintaining the rack vehicles and lines costs far more man-hours than the usual standard gauge lines and locomotives.

In view of the heavy rise in traffic, the Gornergrat railway was forced to revise its timetable, in particular in winter. A 12 minute sequence of trains between Riffelalp and Gornergrat has been introduced, quite a novelty for mountain lines. The entire line is serviced with 24 minute intervals.

Unless there is an unprecedented economic crisis the Gornergrat railway can expect further developments in the future. It owns quite a number of well-frequented ski lifts, which are served by the line. At the moment it seems certain that still higher passenger demand will force the company to invest still more in the

line, rolling stock and other facilities. The railway is financially successful.

What is the future of the Gornergratbahn and other rack railways? Being overwhelmingly tourist lines, their fate depends largely on how many tourists can be attracted to a certain region. Whilst on the Gornergrat the visitor can enjoy on a clear day the sight of 29 of Switzerland's mountains with an altitude of 4000 meters or more, other lines will have to face difficulties from time to time. In my opinion,

despite the wonderful variety of vehicles being used today, the companies should find a way to create standards applicable to all lines, even for the gauges and the rack systems. The existence of two gauges and different rack systems as well as different current systems from Interlaken to the Jungfraujoch may be very interesting for the railway enthusiast, but it is clearly not economical. This is almost certainly one of the reasons why the Jungfraubahnen studied for some time the idea of a cable car line from Grindelwald to Kleine Scheidegg. The change to accepted standards would bring, despite the necessary investments a considerable reduction in prices for the rolling stock, since the various companies could order a higher number of vehicles.

In recent times the concept of the rack line had waned. During the last two years however, several projects have either come to fruition or work has begun. Among others I would like to mention the Monistrol-Montserrat line, abandoned originally in 1957 and which will shortly receive ultra modern motor cars supplied by Stadler Bussnang.

It is my belief that rack railways will have their place within the railway industry in the future.