railway climbing up over the Brenner Pass will be free for passenger trains, if this tunnel is built.

100 miles through rock

The other factor reducing the construction time is the drilling technology. One partner of the IPG joint venture IPG is the Seattle-based Robbins Engineering, which produces tunnel drilling machines. Their experience is unique. If you add up the length of every tunnel in the world, more than half of it has been dug with Robbins' machines.

These engineers estimate that they will dig about 400 meters per month during the first six months of every section, which will gradually increase to 550 meters per month over the next six months, and finally reach an average of 700 meters per month. In some instances, this could be surpassed greatly. During construction of the Channel-Tunnel, digging advanced by more than 1,000 meters in some months. If that is the case here, construction might take less than five years.

The logistics necessary for the construction will be enormous. More than 12.5 million cubic meters of rock will have to be transported out of the tunnel, which will be done with conveyor belts, as used in mining.

A lot of material will have to be brought into the tunnel for lining it with concrete rings. These rings will be put together in the tunnel using prefabricated pieces called tubings. In Germany, Italy, and Austria, special factories for the production of the 900,000 tubings needed will be set up for the duration of the construction. Six of these tubings will form a ring 1.5 meters broad. Special concrete will be necessary to carry the weight of the mountain. In principle, these tubings will just be stuck together, which will save a lot of time during construction. The tubings and other construction materials will be brought into the tunnel on the rail tracks, which will be installed right behind the drilling machine. It will be the same tracks used later for goods transport. The material for the rails themselves, and the steering units for the operation of the maglev transport, will also be transported into the tunnel on these rails.

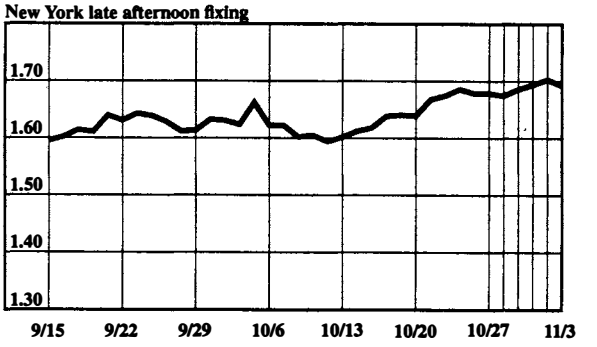
Tunnel Tirol estimates that digging the tunnel itself will cost 21 billion Austrian shillings (ATS), about $2 billion. Other expenses, such as the construction of rails, power supply, disposal of carved-out rock, preparation, planning, and supervision, will bring the bill up to ATS 45 billion ($4.3 billion). Building the other 50 km of tunnel to Bolzano would add ATS 9.2 billion ($900 million). The route from Reutte to Bolzano would cost ATS 23.9 billion ($2.3 billion).

In and of itself, the tunnel is a very sound project, and is long overdue, given the deteriorating infrastructure linking Germany and Italy. Another question is whether to build a second tunnel for passenger traffic right next to it, either for high-speed maglev trains alone, or for high-speed traffic of both maglev and rail trains, like the German ICE. At present, 4,300 trucks, 32,000 cars, and 130 trains pass through the Brenner Pass every day.

Currency Rates

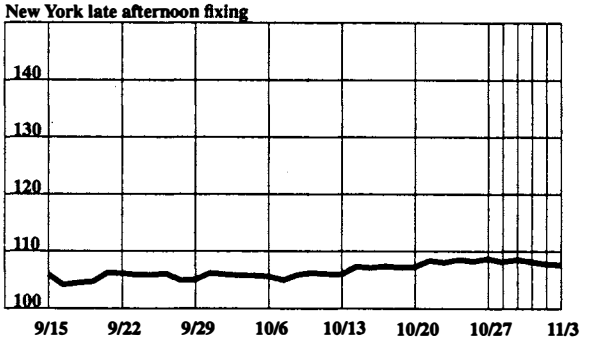
The dollar in deutschemarks

New York late afternoon fixing



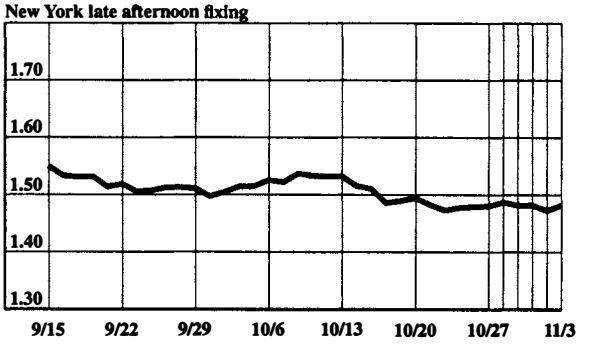
The dollar in yen

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing