

## Gotthard-Durchstich

### Editorial: “Everything will change...”

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**Fig. 1** Durchstich or Durchschlag: the breakdown of the final rock barrier in a tunnel project. The historical moment in the 57 km long Gotthard Base Tunnel, 15 October 2010, 2:17 pm—the face of the

Tunnel Bore Machine appears, a large rock block falls, the audience is tense with excitement (photo adapted from *Neue Zürcher Zeitung*, 16 October 2010)

Even geologists who are used to trying to explain the unexplainable can be surprised at life’s strange meanders. On October 6th, I was driving through the Indian summer near Neuchâtel thinking about the approaching well-publicised media event, the “Durchstich” of the Gotthard Base Tunnel—the festivities surrounding the breaking down of the final barrier in the 57 km long tunnel (Fig. 1). The excavation of this tunnel has been called the Geo-Engineering Project of the Century. I had once been involved, at the very beginning, before the line of the tunnel had been completely fixed, 20 years ago. I remember meditating then on the incredibly long time for completion, on the incredible financial and, possibly,

human cost—and now, here we are! Not only a geo-technical achievement of superlatives, also a geoscientific supernova. Clearly this must be marked by an Editorial in the *Swiss Journal of Geosciences*. But what is left to be said, I was thinking, being bombarded from all sides by grand words and media hype? In fact, perhaps we should rather keep a low profile—geologists are apparently about to be accused of not doing a sufficiently good job and costing the tax payers an extra 350 million francs. Not for the first time, either—remember the notorious Piora-Mulde and the necessary, or perhaps unnecessary, Sondierstollen. Is an Editorial a good idea, I am wondering. Would it perhaps be better drop it?

As I drive, my thoughts far away, the sounds from the radio continue, another tunnel interview apparently... “rock”... “international”... “Gotthard”... “team...–spirit”... “mountain”... “world famous”... Then my unconscious picks up something different... “Er möge in Frieden ruhen”... “Rest in peace, Steve!” I was suddenly wide awake. What had happened? The person being interviewed obliged with an answer: Steve Lee died yesterday, killed as an innocent bystander—the fortuitous victim of someone else’s accident—on a highway near Las Vegas. Steve Lee, he explained for the uninitiated, like myself, was a leading rock musician, front man of the world-famous Swiss rock group “Gotthard” and “einer der besten Hardrock-Sänger der Gegenwart”. Steve Lee’s first hit, in 1993, was apparently “Mountain Mama”, and the group’s latest album “One Team, One Spirit” had been a great international success. After the interview, the last song in the album was played, a lyrical ballad to a single piano accompaniment. The song title was announced as “Everything will change”.

Everything will change ..... the title has geological undertones I thought as I drove. Prophetic words with regard to the Gotthard band after the accident, certainly. And somehow applicable to *our* Gotthard after the Durchstich. Several years after the event, when the new tunnel is opened, everything will change in Switzerland and Swiss society as it did when the first Gotthard tunnel (Durchstich February 1880) and the Gotthard road tunnel (Durchstich December 1976) were opened. For better or for worse, some might say. My thoughts bent back to the question of an Editorial. Also science itself will change. Every major underground construction provides an enormous quantity of high quality geoscientific data. It encourages the development of novel, sophisticated techniques and it greatly increases knowledge of underground conditions in ways which would otherwise never have been possible if it had not been constructed. The vast investment of human and material resources and the enormous costs make quality and security paramount considerations for the way the geoscientific investigations are carried out. The Gotthard Base Tunnel, as the Lötschberg has already demonstrated, is not only an engineering triumph but also a geoscientific goldmine. Detailed knowledge of petrology, structural geology, hydrogeology, geophysics, engineering

geology, etc., has been gained, a vast amount of information is awaiting detailed scientific analysis and review, many new techniques and methodologies have been developed and thoroughly tested. Not only that, the size of the project means that university researchers and consultant geologists get used to working together, are forced to interact in pursuit of a common goal. The often watertight boundary between pure and applied science becomes permeable, in both directions. Scientifically acceptable data acquisition, processing and interpretation becomes paramount on both sides of the divide, and scientific documentation for internal communication becomes part of the process. In Switzerland, these processes are already well advanced—the Gotthard road tunnel, “Projekt Gewähr”, the Lötschberg base tunnel, the Monte Terri underground laboratory, the project Palaeontology A16 along the future A16 highway—all were/are interdisciplinary geo-projects of great size and, potentially, of international impact. All have contributed to the process of integrating theory and practice, academic research and practical application, in the geosciences, which the milestone of the Gotthard Durchstich further symbolizes. All have changed our geological world view.

A “geoscientific goldmine”, yes, I thought, but because of construction timetables, financial limits and managerial constraints, comparatively little of the gold has yet been extracted. There is still a lot of high-grade ore left to be won. As one of the Editors of the Swiss Journal of Geosciences, my hope is that, over the years, as much as possible of the unique body of geological experience and knowledge accumulated during the excavation of Gotthard Base Tunnel will, through continued research and synthesis, be made available to the scientific community through the pages of our journal. In this respect, “everything will change” may be an exaggeration, but major changes in Swiss and Alpine geoscience can certainly be expected.

A.G. Milnes, Editor (Geology)

**Note added in proof** I have just found out that the Swiss radio announcer made a mistake. The song title is “Everything *can* change”. A subtle but significant difference! If the announcement had been correct, this editorial may not have been written. Such is the power of language.