Urban and village fires as semi-meteorological events
The case of inner-Alpine Swiss settlements facing Foehn storms

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Content

- Causes for urban and village fires in the Alps
  - Triggers
  - Fire-promoting factors
  - Early prevention strategies
- Foehn storms in the Alps
- The Grisons, a canton of Foehn valleys
  - Spatial and temporal distribution of village fires
- Meiringen (Canton of Bern): a village hit twice in 12 years
- Reconstruction of the villages
  - Late 19th century: innovative building materials
  - Interwar period: a return to traditional building techniques
Urban and village fires in the Alps
Main causes and contributing factors

- Causes and triggers
  - Lighting strike
  - Arson
  - Earthquakes
  - Spread of forest fires
  - Flying sparks from steam railways

- Fire-promoting factors
  - House fire
  - Shingle roofs, wooden construction of houses in general
  - Fireplaces for crafts
  - Room and street lighting
  - Houses standing close together
  - Strong winds
  - Lack of readily available fire-fighting water
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Urban and village fires in the Alps
Early risk and prevention strategies

- **Roofs**
  - Wood, stone and straw as the most important traditional materials for roofs, depending on the region
  - Shingles used mainly north of the main Alpine ridge
  - Decline of shingles in major towns since the Middle Ages (risk of fire)
  - Bern: Fire Ordinances of 1806 and 1818 as well as Cantonal Fire Regulations of 1819 largely prohibit shingles
Foehn storms

- Foehn storms
  - Dry and relatively warm downslope wind
  - Lee side of the Alps (northern)
  - Frequent in the winter half-year
  - Speed up to 180 km/h

Source: Wikimedia Commons, based on Elvidge & Renfrew 2016
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Foehn storms in the Swiss Alps

Source: MeteoSwiss

Bernese mountains

Upper Rhine Valley (Grisons, St. Gall)

Inner Swiss cantons (Uri et al.)

Source: MeteoSwiss
Urban and village fires in the Alps
The situation in the Grisons

- A land of mountains and valleys
  - Upper reaches of the Rhine and its tributaries dominated by Foehn and other storms
  - Prone to water scarcity in dry years
  - Traditional stone-and-timber construction of houses

- High frequency of village fires
  - 13 major fires documented for the 17th century
  - 53 major fires documented for the 18th century
  - 92 major fires documented for the 19th century

- Larger part of the better documented fires of the 19th and early 20th century related to storms and/or very dry conditions

- Decrease of frequency only in the first half of the 20th century
  - More effective firefighting
Urban and village fires in the Alps Grisons: major village fires explicitly related to storminess (1800-1916)
Urban and village fires in the Alps
Meiringen 1879 and 1891

- Meiringen before the fires of 1879 and 1891
  - Until 1879 mostly wooden houses in Meiringen
  - Only one village well for fire-fighting water
  - Foehn storms quite frequent in the Haslital valley
  - Upcoming international tourism (cf. Sherlock Holmes)

- Village fire of 10 February 1879
  - 110 residential buildings destroyed, 455 homeless
  - Afterwards still wooden houses, but hard roofing
  - Installation of a hydrant network

- Fire of 25 October 1891
  - Large area of destruction again due to Foehn storms
  - One fatality, 183 houses destroyed, 854 homeless
  - Chessboard-like reconstruction of the village
Urban and village fires in the Alps
Meiringen before the fires of 1879 and 1891

Meiringen, Obere Gasse, Pintenwirtschaft Sternen

Daguerreotype by Baron Joseph-Philibert Girault de Prangey, 1849

Source: Haslimuseum Meiringen
The impact of the fire of 1891 (burnt houses in black).
Source: Haslimuseum Meiringen

Urban and village fires in the Alps
Meiringen 1891
Urban and village fires in the Alps
Meiringen 1891

View towards the Hotel Du Sauvage after the fire of 1891. Source: Haslimuseum Meiringen
Urban and village fires in the Alps
Meiringen 1891

View to the west after the end of the clean-up, probably spring 1892. Source: Haslimuseum Meiringen
Urban and village fires in the Alps
Meiringen 1891 as a media event

Urban and village fires in the Alps
New regulations for the (re)construction of villages

- **Grisons**: Revolutionary ideas for the blueprint of newly erected villages
  - Based on first examples from Western Switzerland (1830s)
  - Richard La Nicca, cantonal engineer, and his team (1840s)
  - Rectangular grid structure of the streets
  - Used for villages destroyed by fire and other hazards (e.g. landslides)

- **Amendments to the building regulations in Meiringen and other**
  - “Foehn Decree” of 13 January 1892 and new Building Regulations of 3 February 1892
    - Stone construction for exterior walls mandatory
    - Absolute ban on shingle roofs
    - Even wooden frames for windows and doors prohibited
  - Installation of local fire guards (until Postwar Period)
  - Smoking ban during times of Foehn storms
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**Urban and village fires in the Alps**

Neu-Thuis (Grisons), after the fire of 1845

Plans for the reconstruction of the Neudorfstrasse in Neu-Thuis, 1845/48

Source: Chur, Staatsarchiv Graubünden, Pläne “Dorfbrände” Thusis, Sig. 29.90/1

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Meiringen after 1891

Alignment plan for Meiringen
Source: Haslimuseum
Meiringen

Roads before the fire of 1891
New rectangular road system since 1892
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Meiringen before the fires of 1879/1891 and today

Dorfstrasse before the fires (presumably 1860s) and Kirchgasse today
Source: Haslimuseum Meiringen

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Bonaduz (Grisons), after the fire of 1908

Plans for the reconstruction of Bonaduz, 1910
Source: Chur, Staatsarchiv Graubünden, Dorfpläne, Sig. 29.112/2
Back to old building traditions?
The *Heimatschutz* after 1900 and in the Interwar Period

- Controversial discussion on the new fire-proof style of houses
  - Changes in the size and position of properties
  - Stone-built houses without tradition in most of the inner-alpine valleys
  - Local topography not always suitable for broad, rectangular streets

- Countermovement from around 1900 onwards
  - *Schweizerische Vereinigung für Heimatschutz* (Swiss Society for Homeland Protection)
  - Critique to adapt urban building techniques for rural settlements

- Return to traditional rural village architecture in the 1920s
  - Partly crooked streets reinvented
  - Return of timber as building material
  - Combination of traditional house styles and modern, fire-proof material
Back to old building traditions?
The Heimatschutz after 1900 and in the Interwar Period
Good and bad examples (Heimatschutz journal, 1908)

The village square of Fideris, made homely by the old lime tree and the atmospheric buildings that surround it

The new village square of Zernez, made of miserable, desolate sobriety
Conclusions

- Inner-alpine valleys exposed to an increased risk of village fires
  - Wooden structure of most buildings
  - Frequent Foehn storms and other strong winds
  - Lack of sufficient fire-fighting water supply

- Adaptation strategies since the mid-19th century
  - Reconstruction of villages with broad, rectangular streets
  - Stone buildings replace wooden structures
  - Cantonal Fire Ordinances and Regulations: introduction in many cases after disastrous events
  - Fire guard systems during Foehn storms

- Controversial discussions
  - Functional fire-proof houses vs. re-introduction of traditional building techniques and townscapes by the Heimatschutz
Thank you for your attention!

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