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Autor: Coulon, Maurice de / Franzoni
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The Forest in Peril

The following article is based on an interview with Dr Maurice de Coulon, forestry engineer and Director of the Federal Office for Forestry. Dr de Coulon was born in 1924.

In the 'fifties he was Inspector of Forestry of the town of Neuchâtel. From 1962 to 1967 he was in charge of a project for the development of the mountain regions of the Lebanon. This was done on behalf of the United Nations' Organization's development programme, New York, and FAO (Food and Agriculture Organization in Rome). In 1966, he began the preparatory work for a similar project in Afghanistan.

Today, Switzerland is confronted with the slow decline of the forest. In former years, one thought that the problem was limited to neighbouring countries. What is the position in Switzerland today? The decline of the forest in Switzerland has increased rapidly and is as alarming as in the neighbouring countries.

Damage to a considerable extent was discovered in the spring of 1983, above all on the white fir in Northern Switzerland, in the Jura and the Midlands; also affected were red fir, stone pine, beech trees and other kinds of wood. Since a short time ago, the spruce woods on the southern Pre-Alps have also been affected, and even the mountain forests above 1200m. There are signs that the decay is slowly reaching the highest mountain forests. This will have grave consequences for our mountain regions because these forests carry out a protective function which must not be underestimated. If the extent of the damage has not yet reached spectacular dimensions as far as the general public is concerned, it is nevertheless disturbing and, from the foresters' view, even catastrophic. Generally speaking, so far there are only few trees in our forests which have died completely. Even the layman can tell without difficulty that many trees

have only half the needles left on them.

Which are the main reasons for the deterioration?

The main reason is air pollution and as far as poisonous substances are concerned, sulphur compounds, nitric oxide and ozone are the worst culprits. Such poisonous matter originate from home heating systems, industry, exhaust gases, thermal power stations and motor vehicles.

Surely woods were imperilled already considerably at times in the last century. The first photographs of ailing woods comparable to the peril of today were from the beginning of this century? Why should there be so much talk about it today?

There have always been considerable fluctuations in silviculture, so for instance through attacks of parasites or adverse weather influences like snow, wind, drought etc. Such natural damage was always of a transitory nature and never resulted in a complete breakdown of the ecological system of the forest. All such incidents could be overcome, because soil, vegetation, air and water never caused irreparable damage.

What is so alarming today is the irrevocability of the situation. In Germany for instance, whole forests can no longer recuperate; their condition gets worse every year. This is clear proof that the decline is not due to natural occurrences.

Is it possible to differentiate between natural causes and air pollution with regard to the decay? Which is the real connection between air pollution and the decline in the condition of the trees?

As «the devil's advocate» one could easily claim that it was all due to natural causes. This attitude would be contradicted by the fact that the woods in the French-speaking part of Switzerland have been far less affected than in German-speaking Switzerland, although the dry weather last summer was the same all over the country. An analysis of the concentrated poisonous substances found in the fir needles showed that they were far more prevalent in the north of the country. Obviously, there is some connection between damage to forests and air pollution.

Why does the decay affect certain kinds of trees more than others?

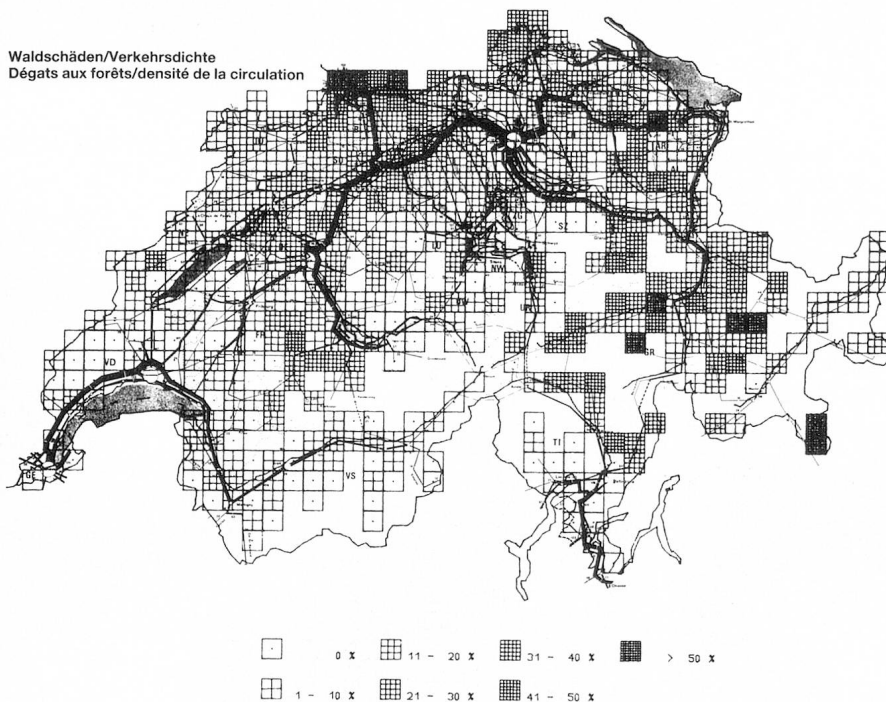
It is certainly of some significance that the conifer keeps the needles for several years, and thus the damaging agents from the air can accumulate for some time. The deciduous tree, on the other hand, revives every autumn and is therefore far less susceptible to sustained attacks.

How can the great regional differences in forest decay be explained: 70% of all trees in the Canton of Baselstadt are affected, whilst in the Canton of Geneva nearly all trees are healthy. Which is the connection between forest decay and road traffic?

There is a large amount of road traffic in the Geneva region. In spite of car exhaust fumes with their nitric oxide, woods in that region show little decay. For this there are two reasons.

Firstly, there are practically no coniferous woods in that Canton, as opposed to the German-speaking part of Switzerland; as has been mentioned, conifers react to air pollution, but in a way hardly dis-

Waldschäden/Verkehrsdichte
Dégâts aux forêts/densité de la circulation



cernible by man. Secondly, exhaust fumes mean no immediate danger for the forest at the moment of their emission. These poisons remain in the atmosphere for some hours, even days, and undergo chemical changes before they become active within the ecological system. They are blown away, mount into the atmosphere and are exposed to the ultra-violet rays. From the nitric oxide, so-called photoxidants develops like ozone. It is only the latter which attack the leaves of the trees. These photoxidants are not formed in the centre of Geneva – we find them at a distance of 10 to 30 km. In addition, they accumulate more likely at an altitude of below 700 to 900 m. Decaying forests due to air pollution in the Canton of Geneva are probably found in the Vaudois Jura. For this reason it is by no means the trees near motor roads which are affected most. In northern Switzerland, however, we find the largest concentration of industry in the whole country, and the forests suffer the consequences. In addition, we know that air pollution causes poisons to concentrate in

fog, and these are two to five times higher than elsewhere. From satellite photographs we know that north of the Alps there are frequent fog banks which begin in the Basle region. In the east of our country, above all in the valleys of the Grisons, air cannot circulate normally; through that, a kind of oscillation is created which lets the polluted air stagnate. This process results in an extraordinarily high concentration of dangerous substances and consequently considerable damage to forests.

Air pollution in Switzerland comes from abroad to a large extent. Is this a fact?

How large is the proportion of the poisons which come from abroad as compared to the «endemic» ones?

We import about 80% of the nitric oxides (SO₂).

Although air pollution by sulphuric dioxide originates abroad to a large extent, forest decay cannot be explained alone by the contents of sulphuric dioxide in the

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air. It is only the combination of this substance with the nitric oxides from inside Switzerland which results in the real danger to the forests.

It has to be stressed that the emission of nitric oxides has increased considerably during the past few years, whilst the proportion of sulphuric dioxides has decreased, mainly due to the stricter control of heating systems and exhaust fumes.

What is the cycle in the decay of a tree?

Air pollution causes chronic poisoning in a tree, which, at first, is not visible and shows only after some time. The symptom of the sickness as well as the extent of the damage can change through secondary influences, such as vermin or other factors. The trees weakened by immissions are particularly susceptible to parasite epidemics. A tree affected by the bark-beetle drives out completely within a few weeks, though the effect of the vermin is only of secondary importance: all the natural factors generally speed up the development.

What are the consequences of decaying forests in the short and the long term?

In the short term the result is above all financial loss for the owner of the forest, who often is compelled to cut down the whole stand of trees before time and to fight vermin. Long-term damage means avalanches, landslides, climatic changes, shortage of wood etc.

How can these effects be mitigated?

The forestry services traditionally responsible for the woods are fully occupied under the circumstances to establish the damage, to check developments

and to cut down the decaying and dead trees; they only fight the symptoms to a large extent.

The real fight against the basic cause of the blight must be carried on by the politicians and the people. All measures taken with regard to ecology in whatever field must have the same aim, viz. to reduce air pollution as much as possible in an economically viable manner.

One often hears that scientists are not in a position to prove con-

clusively that forest decay is connected with air pollution. With this, the delicate question is raised of irrefutable evidence of natural-scientific experiments. Nevertheless, we have a large number of proofs in that direction which at least make it highly probable that the relation as explained is more than justified. We may and must act as quickly as possible, in order to keep any widening of the damage within limits. *Interview: ASS/Franzoni*

Book reviews

All the books reviewed below can be ordered either from the publishing house mentioned or from the Secretariat of the Swiss Abroad, Alpenstrasse 26, CH-3016 Bern, Switzerland.

«Le Tessin dans les relations entre la Suisse et l'Italie 1922-1940»

by *Marzio Rigonalli*

Published by *Pedrazzini, Locarno, 1983*

Price in Swiss Francs: 38.-

In French

Based on intensive research, the book traces the tripartite relationship between Berne, the Ticino and Rome at the time of Federal Councillor Giuseppe Motta.

«In Valmaggia»

by *Aldo Patocchi*

Published by *Pedrazzini, Locarno, 1984*

Format: 30 x 43 cm

Price in Swiss Francs: 120.-

In Italian

This outstanding and carefully compiled book contains reproductions of the twelve woodcuts by the author, one of the most prominent woodcut artists of our times. With these pictures, he let us look into the character of his home valley, the Valle Maggia in the Ticino.

«Très riches Heures du Duc de Berry»

Published by *Faksimile-Verlag, Lucerne, 1983*

One of the most famous manuscripts in the world, the prayer-book (medieval book of meditation) «Très riches Heures du Duc de Berry», jealously protected at the Château de Chantilly, dates back to 1410-1485. The unique beauty of the

paintings made the book world-famous, a beauty hardly achieved again since then. One volume contains the complete facsimile edition with 131 gold-illuminated pictures, as well as numerous manuscripts, a total of 416 pages. This is accompanied by a volume of comment and explanation which present the reader with detailed information on the miniatures (200 pages). The edition is limited to 980 copies. Anyone interested in subscribing to this superb work of art should apply direct to Faksimile-Verlag, Alpenstrasse 5, 6004 Lucerne, Switzerland.

«Qui dirige la Suisse?»

by *Hans Tschäni,*

Published by *24 Heures, Lausanne, 1984*

Price in Swiss Francs: 32.-

In German: «*Wer regiert die Schweiz?*»

Published by *Orell Füssli, Zurich, 1983*

Price in Swiss Francs: 29.80

In Italian: «*Chi governa la Svizzera?*»

Published by *Editions Casagrande, Bellinzona, 1983*

Price in Swiss Francs: 26.80

The book is an analysis of legislation in Switzerland and the considerable influence of interested pressure groups at all stages of the legislative process.

Dürrenäsch

by *Samuel Hochstrasser-Humbel,*

Commune Clerk of *Dürrenäsch*

Published by *Druckerei Baumann,*

Menziken

127 pages in German

Price: Fr. 10.-.

The author presents the history and present life of the Aargau village of Dürrenäsch in this well-illustrated book. The village is remembered by many Swiss from abroad from stays at the «Home» for Swiss abroad, now no longer in existence.