Cartography in Switzerland 1976–1980
National Report for the ICA–Conference Tokyo 1980

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CARTOGRAPHY IN SWITZERLAND 1976 - 1980

National Report Presented to the 10th International Conference of the International Cartographic Association, Tokyo 1980

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The map samples have been made available from the offices and firms concerned.
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Preface

The Swiss Society of Cartography (SSC) presents with this booklet for the third time a national report to the Conference of the International Cartographic Association (ICA). It is published in a german and an english version and we have tried to give as complete as possible a report of the cartographic activities in Switzerland for the period 1976 to 1980.

The undersigned would like to thank all members of the society, official agencies, institutes and companies, which have contributed to this voluminous, well illustrated report by writing particular texts or making map samples available.

May this booklet find the interest of the participants of the International Cartographic Conference in Tokyo and of the members of the Swiss Society of Cartography.

Berne, January 1980

The president of the SSC

Dr. E. Gächter
1 The Activities of the Swiss Society of Cartography

1.1 Aims of the Society

The Swiss Society of Cartography (SSC), founded in 1969, is an association of specialists and other people interested in cartography. It aims at the advancement of theoretical and practical cartography and the education of professional people. The society seeks to disseminate knowledge in the field of map production, map use and map history, and to exchange know-how with specialists of the home and foreign countries.

The aims of the society shall be achieved through scientific meetings, technical visits and educational courses, through the work of commissions and working groups, through the edition of internal news letters (about six times per year) and through the editing of educational publications.

1.2 Members

The number of members of the SSC mounted from 167 in 1976 to 187 on January 1, 1980. These are divided into 166 individual and 21 collective members (official agencies, firms, institutes). The individual members consist of about 73% cartographers and persons working in the cartographic branch, 16% surveying engineers and 11% geographers. About 50% of the practising cartographers of Switzerland are members of the SSC.

1.3 Executive Committee

The executive committee of the SSC consisted in 1976 of Mr. Kurt Ficker (president), Dr. Ernst Gächter (secretary), Mr. Charles Trostel (treasurer), and Prof. Ernst Spiess, Mr. Walter Bantel, Mr. Jean-Martin Herrmann and Mr. Hans-Joachim Hesse.

In the following years Prof. E. Spiess, W. Bantel, J.-M. Herrmann, K. Ficker and Ch. Trostel retired after 6 to 10 years of membership in the committee. On January 1, 1980 the following persons were members of the executive committee:

President: Dr. Ernst Gächter, Berne
Secretary I (minutes, external affairs): Dipl.Ing. Christian Hoinkes, Zurich / Brugg
Secretary II (membership): Frank Weber, Murten
Treasurer: Hans-Uli Feldmann, Wabern / Murten
Delivery of publications: Hans-Joachim Hesse, Zurich
Further Members: Ing.grad. Gert Schelling, Zurich
Claude Vez, Berne / Bäriswil
1.4 Scientific and Technical Meetings

The SSC has organised the following meetings in the reporting period from 1976 to 1980 (partly together with the annual general meeting):

1976:  - Geography and Cartography, Activities of the Institute of Geography of the University of Berne (reports and visit)

1977:  - Activities of the Institute of Cartography and the Institute of National, Regional and Local Planning of the Federal Institute of Technology, Zurich (reports and visit of the new buildings at the Hönggerberg)

1978:  - Tasks of an Urban Survey-Office (report and visit of the exhibition commemorating the hundredth anniversary of the survey office of the City of Berne)
   - Thematic Cartography - Graphics, Concepts, Techniques (see section 1.8)
   - Introduction into Remote sensing (reports)

1979:  - Excursions to the Lake of Lucerne, Central Switzerland (with geomorphological and geographical comments), visit of the building site of the N2 motorway (Beckenried, Seelisberg tunnel)


1.5 Educational Courses

The SSC has organised in the reporting period the following courses, which have partly also been accessible for non-members:

1976:  - Basic Knowledge of Topography and Introduction into Graphic Design (Berne)

1977:  - Reproduction Techniques for Cartographers (Zurich)

1978:  - Reproduction Techniques for Cartographers (Berne)

1979:  - Photogrammetry and Orthophotography for Cartographers (Zurich)

1980:  - Reproduction Techniques for Cartographers (Berne, repetition)
   - Operations Scheduling (Zurich)

The courses comprised generally 3 to 4 evening lessons or two half days with theoretical introductions and practical demonstrations. The courses have been attended by about twenty persons each.

1.6 Commissions / Working Groups of the SSC

In the reporting period one commission and one working group were active.
Apprenticeship Commission
(Report by K. Ficker)

In 1974 this commission was formed under the leadership of the author. It was charged with the compilation of new regulations for the apprenticeship and final examination of cartographers.

The starting point of this commission was the need to adapt the provisional regulations of 1972 to the latest development of technology. In addition it had to be checked whether Cartography should follow the general trend of the Graphic Arts Industries to reduce the duration of apprenticeships from 4 to 3 years. Also, the possibility of introducing a two-step apprenticeship, or of dividing the apprenticeship into one for cartographic draftsmen and one for cartographers, had to be discussed.

Finally the commission voted clearly for four years duration and only one curriculum for all cartographers. Then it was necessary to formulate the aims of the education within the firms, and to distribute the required instructions over the four years. The following sequence of teaching subjects was established: General Introduction, Lettering, Drawing Techniques, Cut-and-Peel Masks, Scribing on Glass and Film, Stick-up Techniques, Relief Shading, Rock Drawing, Generalisation, Methods of Map Revision and Map Design.

For the final examination a new subject "special calculations" was added to the broader subject "professional knowledge". The overall result of the examination is now expressed by a single mark, which is derived from the following individual marks: practical works (triple weight), professional knowledge (average of all semester marks for the subjects "cartography" and "production methods"), general education.

In the next phase it was necessary to establish the curriculum for the cartographers classes (one of lower, one of higher level) at the Arts-and-Crafts School Berne. The need to split the small number of about 30 apprentices from all over Switzerland into just one lower and one higher grade class leads to some unavoidable overlap in teaching. The teachers, most of them only part-time, were of great help in formulating the aims and objectives of the various lessons. The curriculum finally consisted of the following compulsory subjects: 320 lessons cartography, 60 lessons theory of colours, 120 lessons map design, 160 lessons production methods, 60 lessons geography and 80 lessons surveying methods.

In addition, the subjects of general education (German, Business Organisation, Civics and Economics, Mathematics) had to be included, as well as Gymnastics and Sports. The program was designed for a single school day per week.

In 1976 the new regulations were submitted to the Office of Wages of the Employers Association, and 1977 they were passed on to the Federal Office of Industry, Crafts and Labour. This Office finally put the new regulations into force after thorough inspection in February 1979.

However, the technical development doesn't stop. Therefore we have formulated these regulations in such a way that the teachers in class and in the firms still have enough elbow-room to adapt new concepts quickly and to develop their own didactical concepts.
Working Group on History of Cartography

(Report by Prof. A. Dürst)

This working group was founded in 1978 under the leadership of the author. It has 20 members by now, and has already been quite active. Several exhibitions of ancient maps have been organized by its members. Unfortunately, we have also the sad duty to report the death of two very honourable historians, Franz Grenacher from Bale, and Dr. Rudolf Steiger, Zurich.

By generous donations two very valuable collections of historical maps have been opened for the public. Prof. Dr. h.c. Albert Knöpfler gave his collection, which mainly contains maps of the whole country and of the eastern part, especially of the region along the Lake of Constance, to the Museum of Bischofszell. Dipl. Ing. Walter Blumer gave his treasures of old maps of Switzerland and the Canton of Glarus to the Archives of Glarus. An anonymous Mæcenas made it possible for the Swiss National Museum in Zurich to buy the "Small Celestial Globe" of Jost Bürgi, dating back to 1594, by a donation of nearly two million Swiss Francs.

As mentioned before, several larger exhibitions were organized in the reporting period. Three exhibitions showed the donations of Prof. Knöpfler and Ing. Blumer (Museum Bischofszell, Palace "Freuler" in Naefels and House of Traffic, Lucerne). Two exhibitions were organized on occasion of the "Meeting of the Three Countries" (Germany, Austria and Switzerland in Berne 1978, see section 1.8), one in the Alpine Museum Berne, called "Three centuries of the Art of Map Making in Berne", another one in the "Central Library", Zurich, on "Zurich seen by its Map Makers". A last exhibition was held in St. Gallen on the occasion of the 100th anniversary of the Geographical Society of Eastern Switzerland, showing "The Region between Säntis and the Lake of Constance on Old Maps". Finally, the Union Bank of Switzerland together with Scandinavian Airlines Systems presented an exhibition on "The World on Old Maps", in Berne and Zurich. All exhibitions were supplemented by catalogues, which were prepared - with only one exception - by members of our working group.

Much was done also for facsimile reproductions of old maps. Special merits were earned by the publishers Urs Graf / Josef Stocker (Dietikon-Zürich), Emil Matthieu (Zürich), Hürlimann (Launau a.A.) and Plepp / A. Cavelti (Köln) for excellent quality and scientific documentation of their work. The following maps and atlases are mentioned as being the most interesting ones of the large number of reproduced works:

Titel / title:
Plan der Stadt Basel 1615

Erscheinungsjahr / year of publication:
1975 / 1976

Autor / author:
Matthäus Merian der Ältere / the Elder

Herausgeber / publisher:
Verlag Matthieu, Zürich

Druck / printing:
Print-Service, Hans Beusch, Schlieren / Zürich

Inhalt / content:
Planvedute der Stadt Basel
(Gesamtformat ca. 164 x 115 cm)
in 9 Blättern. Kommentar von
L. W. Wüthrich, Zürich.

Reproduktion / reproduction:
Faksimile-Reproduktion in
Originalgrösse, 6-Farben-
Photolithographie; 6-Farben-Offset-
druck.
Limitierte Auflage von 900
Exemplaren.
(Die rückseitige Abbildung ist
ein verkleinerter Ausschnitt aus dem
Gesamplan im 4-Farben-Offsetdruck.)

Bird's-eye view of the City of
Basle (size approx. 164 x 115 cm)
in 9 sheets. Comment by
L. W. Wüthrich, Zurich.

Facsimile-reproduction in
original size. Six-colour
photolithography; six-colour
offset-printing.
Limited edition of 900 copies.
(The reproduction on the reverse
side is a reduced detail from
the original plan in four
colour-offsetprint.)
Karte des Schwabenlandes von 1636
«Abbildung des ganzen Landts Schwaben, Württemberg, Elsaß, Pfalz, und Margrafschaft Baden sampt angrätzenden ortten»
c. a: 1:1000000
1978
David Hautt
Prof. A. Dürst, Zürich
Verlag Dorfpresse Gattikon
B. Hürlimann-Senn
CH-8135 Langnau a. A.

Topographische Karte des Landes Schwaben

Faksimile-Kupferdruck auf einer mehr als 100 Jahre alten Presse nach dem einzigen bekannten Original von David Hautt d. Ä., aus privatbesitz in Mainz. Neu geätzte Platte, Grösse 41 x 31 cm. Handgeschöpftes Büttenpapier von ca. 180 gm², 48 x 38 cm, mit dem ursprünglichen Wasserzeichen «Bär mit Korne».

Map of Swabia, 1636
«Abbildung des ganzen Landts Schwaben, Württemberg, Elsaß, Pfalz, und Margrafschaft Baden sampt angrätzenden ortten»
approx. 1:1000000
1978
David Hautt
Prof. A. Dürst, Zürich
Verlag Dorfpresse Gattikon
B. Hürlimann-Senn
CH-8135 Langnau a. A. (Switzerland)

Topographical map of the southern part of Germany, called "Schwabenland"

Facsimile copperplate-printing on a more than 100 years old printing-press after the only known original from David Hautt, in private property in Mainz. Plate newly etched, size 41 x 31 cm. Hand-made paper, about 180 gm², 48 x 38 cm, with the original water-mark «Bear with Crown».


Auflage 490 handnumerierte Exemplare, sowie 40 römisch numerierte, nicht für den Handel bestimmte Exemplare.

Preis sFr. 780.–
Mehrpries für Ganzlederbände (Faksimile und Kommentarband) sFr. 180.–

Urs Graf Verlag
Hasenbergstrasse 7
CH-8953 Dietikon-Zürich
Schweiz
The literature on map history was also flourishing, especially because of the scientific research on the above-mentioned facsimile reproductions. The authors are Prof. G. Grosjean (three articles), Prof. Dr. h. c. E. Imhof, Dr. L. Wüthrich, M. Hammer-Cavelti (one each) and Prof. A. Dürst (five). An independent publication was "Johann Rudolf Stengel 1824-1857, Ingenieur-Topograph und Mitarbeiter Dufours" by Alfred Oberli (Edition Plepp / A. Cavelti). Finally the following facsimile and catalogue work is important for the history of maps in Switzerland, although it did not appear in a Swiss Publishing House: "Der Bodensee mit den angrenzenden Gebieten Deutschlands, Oesterreichs und der Schweiz in alten Kartendarstellungen" (old maps of the Lake of Constance and surrounding regions) by U. Bonaconsa and A. Dürst.

The rising interest in old maps is also reflected by the fact that in autumn 1979 the "Swiss Society of Librarians" founded a "Union of Map Librarians" (presided by Dr. H. Laupper, Glarus), and also by the first regular lectures held on map history at the University of Zurich by the author.
(3 facsimile supplements attached)

1.7 Polls

After an interrogation of the SSC among the cartographic firms in 1971 has shown a probable deficit of trained specialists for the following years, the economic depression has changed quickly the situation and in the middle of the 'seventies' a lack of jobs for cartographers after finishing their apprenticeship seemed possible.

The SSC therefore started again an interrogation about the situation on the labour market until 1985 in spring 1977 among all private and official agencies in Switzerland, which employ cartographers.

It was asked for the number of persons, which were engaged in cartographic work in 1977, and the number which would probably be engaged in 1980 and 1985. To that we asked for the number of cartographers which would retire due to pensioning in the next years, and the number of newly opening jobs. A comparison between these figures and the annual number of apprentices showed a surplus of trained cartographers in some of the years concerned.

Meanwhile the economic situation has improved distinctly again, and therefore the apprehension of unemployed cartographers in Switzerland doesn't exist anymore for the moment.

In 1978 the SSC carried out another interrogation among its members about the content and design of the "Kartographische Nachrichten", published by the Kirschbaum Verlag, Bonn-Bad Godesberg (FRG). This journal is the common organ of the German Society of Cartography (DGfK), the Austrian Cartographic Commission and the SSC since 1976. It is distributed six times a year to all members. The opinions expressed have been transmitted to the editor's office at Berlin (West). The problem is mainly to find authors which write articles appropriate to the majority of the readers.
1.8 Cartographic Meeting of the Three Countries 1978

Together with the German Society for Cartography (FRG) and the Austrian Cartographic Commission the SSC organised from May 8th to 12th 1978 an international meeting at Berne, which was attended by some 620 participants from 13 countries. On the occasion of the opening ceremony the president of the International Cartographic Association, Prof. Dr. F.J. Ormeling, also delivered an address.

The subject of the meeting was "Thematic Cartography - Graphics, Concepts, Techniques". The meeting comprised ten lectures, an exhibition with the subject of the meeting and a commercial exhibition. Besides, the programme offered a reception of the authorities of town and canton of Berne, a ladies program, an exhibition about the "Atlas of Switzerland" at Berne, two exhibitions on the history of cartography in Switzerland at Berne and Zurich, technical visits of the Federal Office of Topography and Kümmerly + Frey Ltd. in Berne, Orell Füssli Graphical Arts Ltd. and the Department of Cartography at the Federal Institute of Technology in Zurich. The meeting was closed with four geographical excursions in the surroundings of Berne and the Bernese Oberland.

Within the scope of the meeting the SSC edited the following publications:

- Program of the meeting with exhibition catalogs "Thematic Cartography" and "Atlas of Switzerland",
- Collection of the papers of the meeting and other contributions to the subject of thematic cartography (see section 1.9, no. 3),
- Two catalogs for the exhibitions on the history of Swiss maps (see section 1.6, working group "History of Cartography").

The meeting demanded from the society and the committee a big effort, but has generally found appreciation among the participants.

1.9 Publications

The SSC has published in the reporting period the following numbers of its cartographic publication series:

No. 1 (second edition 1980): Kartographische Generalisierung (Topographische Karten), 62 pages, 150 figures, size 29.8 by 21 cm, loose leafs (German edition of No. 2) SFrs. 30.-.

No. 2 (1977): Cartographic Generalisation (Topographic maps), 62 pages, 150 figures, size 29.8 by 21 cm, loose leafs, SFrs. 35.-.

No. 3 (1978): Thematische Kartographie - Graphik, Konzeption, Technik; 216 pages, 42 figures, 4 map cuttings, size 24 by 17 cm, stitched (content: 10 papers of the Cartographic Meeting of the Three Countries and 7 other contributions; partly with English summaries), SFrs. 30.-.

No. 4 (1980): Kartographie in der Schweiz 1976-1980, Landesbericht zu Händen der 10. IKV-Konferenz in Tokio; 88 pages, 22 map samples, size 24 by 17 cm, stitched (German edition of no. 5), SFrs. 20.-.
No. 5 (1980): Cartography in Switzerland 1976-1980, National Report for the 10th ICA-Conference at Tokyo; 91 pages, 22 map samples, size 24 by 17 cm, stitched, SFrs. 25.-.

The publications can be ordered through bookshops or directly at the following address:

SGK c/o Orell Füssli Graphic Arts Ltd., P.O. Box, CH-8036 Zurich/Switzerland

Direct delivery only on advance payment (postage included in the prices given) to postal cheque account 80-8839, Schweizerische Gesellschaft für Kartographie, Publikationenversand, Zurich/Switzerland.

1.10 Work in ICA-Commissions

In the period of this report the SSC was represented in the following ICA-Commissions by one of its members:

Commission I (Education): Prof. E. Spiess
Commission II (Multilingual Dictionary): Prof. E. Spiess
Commission IV (Communication): Dipl. Ing. R. Knöpfli
Commission V (Technology): Prof. E. Spiess
   (president until 1976)
Commission VI (History): Prof. A. Dürst (since 1979)
Common Working Group IGU/ICA on Environmental Atlases:
   Prof. Dr. H. Elsasser and Dr. H. Trachsel

Commission I works on a "Multilingual Basic Manual on Cartography". Prof. Spiess is in charge of the chapter "Map Compilation and Generalisation".


From 9.-13. July 1979 Commission III held a joint meeting with similar Commissions of the Sister Organisations "International Society of Photogrammetry" (ISP) and "International Federation of Surveyors" (FIG) in Zurich. It was organized jointly by the Department of Cartography and the Department of Geodesy and Photogrammetry of the Swiss Federal Institute of Technology (ETH), Zurich, with some aid from the SSC and other organisations. The subject was "Digital Technology in Topographic Mapping, the Respective Roles of Photogrammetrist and Cartographer", and the results were recommendations for future commission work, which have been published in several professional journals.

A working group of Commission IV held a meeting in Berne on May 6th, 1978, which was chaired by Dr. K. H. Meine (FRG).

In Commission V Prof. E. Spiess works on a "Handbook of Cartographic Techniques", which should be finished in 1980.
1.11 Relation to the Swiss Academy of Sciences

The SSC is since 1977 a collective member of the Swiss Geographical Society, the parent organization of all geographical societies of Switzerland. The Swiss Geographical Society again is member of the Swiss Academy of Sciences.

The SSC was represented in the enlarged committee of the Swiss Geographical Society by its secretary, respectively its president, Dr. E. Gächter.

The committee of the Swiss Geographical Society (president 1976-1980 Prof. Dr. C. Raffestin, Geneva) forms the National Committee of the International Geographical Union (IGU).

Cartography is also represented in the Swiss Geographical Commission (scientific commission of the Swiss Academy of Sciences) with one member. Until the end of 1977 this was Prof. E. Spiess. Since then this function is also fulfilled by Dr. E. Gächter.

The Swiss Geographical Commission (president until October 31st, 1979: Prof. Dr. L. Bridel, Lausanne; since November 1st, 1979: Dr. J. Barbier, Lausanne) aims at the promotion of the exchange of scientific knowledge and at national collaboration in the field of Geography and supports the organisation of scientific meetings and publications through financial aid. The commission publishes each year a list of Swiss geographical manuscripts (unpublished papers from the geographical institutes, like seminar papers, diploma works, etc.).
2 Cartographic Activities in Switzerland

2.1 The Swiss Cadastral Surveying

The cadastral surveying in Switzerland is executed by some 230 private land surveyor offices and by 15 official city or community surveying offices under the auspices of the cantonal surveying offices and the Federal Directorate of Cadastral Surveys.

The scale of the cadastral maps varies from 1:250 to 1:10'000 depending on the value of the ground and the mean size of the lots. The property boundary survey and the compilation and reproduction of the topographic map 1:5'000 or 1:10'000 is still going on. The compilation of the topographic maps is performed today mainly through aerial photogrammetry. The state of works is shown on the table below and on the following three figures.

State of the works on January 1st, 1979:

<table>
<thead>
<tr>
<th></th>
<th>Property Boundary Survey</th>
<th>Large Scale Topographic Map of the original</th>
<th>Reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area to be covered</td>
<td>38'812 km²</td>
<td>39'943 km²</td>
<td>39'943 km²</td>
</tr>
<tr>
<td>Definitely or provisionally accepted by federal authorities</td>
<td>63.4%</td>
<td>93.5%</td>
<td>54.2%</td>
</tr>
<tr>
<td>In preparation</td>
<td>5.5%</td>
<td>1.7%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Not yet done</td>
<td>31.1%</td>
<td>4.8%</td>
<td>41.3%</td>
</tr>
</tbody>
</table>

An example of the tasks of a city surveying office in cartography is given in section 2.2 (Surveying Office of the City of Zurich).
State of Compilation of the Original for the Large Scale Topographic Maps 1.1.1979

definitely accepted
in preparation

Swiss Federal Directorate of Cadastral Surveys, Berne

Swiss Federal Directorate of Cadastral Surveys, Berne
2.2 Offices

Federal Office of Topography
Seftigenstrasse 264, CH-3084 Wabern

The Federal Office of Topography employs a staff of 151, which is distributed to various professions as follows:

Geodesy / Topography
- Surveying engineers 9
- Surveying technicians and surveying draftsmen 26

Cartography / Reproduction / Printing
- Cartography 53
- Photography 17
- Printing 9

Other Sections (including auxiliary staff) 37

Totally 151

The Swiss National Map Series

1 : 25 000 : 249 sheets, since 1979 all published = 100 %
1 : 50 000 : 77\(\frac{1}{2}\) sheets, since 1960 all published = 100 %
1 : 100 000 : 22\(\frac{1}{2}\) sheets, since 1964 all published = 100 %
1 : 200 000 : 4 sheets, since 1976 all published = 100 %
1 : 500 000 : 1 sheet, published since 1964

With the completion of sheet 1292, Maggia, scale 1 : 25'000, all sheets of the Swiss National Maps have been issued.

The main task now is the map-revision. Since 1968, all maps have been revised in a 6-year cycle. In 1980, already the 3rd revision will begin (see Figure).

The "Atlas of Switzerland"

This collection of thematic maps, published by order of the Federal Department of the Interior, was edited by Professor E. Imhof. The first delivery of sheets was published in 1965. With the completion of the 9th delivery in spring 1978, this standard work of 97 sheets was concluded for the time being.

The revision as well as the publication of additional sheets has since been approved by the Federal Council. New editor in charge is Professor E. Spiess, head of the Department of Cartography, Swiss Federal Institute of Technology in Zurich.

The basic map used for most of the thematic maps is the Swiss National Map in the scale 1 : 500 000.
Special Maps

The now complete collection of Swiss National Maps serves as an excellent topographic basis, which can be used to represent many different themes. The map 1 : 200,000, for instance, is being used by the Federal Office of Topography for a new political map as well as for a map (4 sheets) of the Swiss castles, which is being made in cooperation with the Swiss Castle Association. Only the fourth sheet of this series has not yet been issued. Furthermore, a special mention should be made of the map of major cultural values in Switzerland and Liechtenstein 1 : 300,000 and the 1 : 500,000 ICAO-map covering Switzerland, which was published by order of the Aeronautical Information Service of the Federal Office for Civil Aviation.

Along with these maps, the Federal Office of Topography is also working on several special maps for the administration.

map sample  

(R. Knöpfli)

The Swiss National Maps, Revision Cycle

Bundesamt für Landestopographie 3084 Wabern
Swiss National Map 1:25000
Sheet 1269, Aletschgletscher
Producer and editor: Federal Office of Topography
First edition 1975 (complete revision 1977)
Contents: typical sheet of mountainous area. It shows
    Switzerland’s largest and probably most
    famous glacier.
Purpose: mainly for tourists,
    but also as a basic map for thematic imprints
Reproduction: Scribing on coated glass.
    8-colour offset printing.
Size: 70 cm × 48 cm
Equidistance of the contour lines: 20 m

Landeskarte der Schweiz 1:25000
Blatt 1269, Aletschgletscher
Hersteller und Herausgeber: Bundesamt für Landestopographie
Erstausgabe 1975 (Gesamtnachführung 1977)
Inhalt: typisches Gebirgsblatt. Es zeigt den grössten und
    wohl auch bekanntesten Gletscher der Schweiz.
Zweck: zur Hauptsache für den Tourismus,
    dann aber auch als Basiskarte für thematische
    Eindrucke.
Reproduktionsverfahren: Gravur in Schicht auf Glas.
    8-farbiger Offsetdruck.
Format: 70 cm × 48 cm.
Aequidistanz der Höhenkurven: 20 m
Federal Office of Civil Aviation
Inselgasse, CH-3003 Bern

General
The Swiss official aeronautical charts are published by the Federal Office of Civil Aviation (FAO), CH-3003 Berne. They are part of the Aeronautical Information Publication (AIP)-Switzerland, but may be obtained separately. The National Map series is used as topographic base map for most aeronautical charts. These are drawn at scales varying from 1:10'000 to 1:1'250'000 and are printed by the Federal Office of Topography (FOT).

Methods of Production
The Central Aeronautical Information Service (AIS) is charged with the AIP and maps publications; it has a staff of 3 persons. One AIS specialist is responsible for the compilation, the editing and revision of the charts as well as the check-up of the originals before production. The lack of specialized staff and of adequate equipment forces the AIS to charge private cartographic firms with the drawing and reproduction of the map originals.

Activities (1976 until end of 79)
- In the course of regular AIP amendments, Approach and Landing Charts (VAL/ILA), Aerodrome Charts, Aerodrome Obstacle Charts, Index Charts, etc. are published at an annual rate of about 30 in size A4, 10 in A3 or larger format (10'000 copies per chart).
- Aeronautical Chart ICAO-1:500'000, 2253-B/Switzerland
  The 8th edition, 1976, (16'000 copies) has been completely revised in co-operation with the FOT. Making use of the Digital Cartographic System of the Swiss Federal Institute of Technology (ETH), Department of Cartography at Zurich, placement data of the aeronautical overprint are stored and rapidly accessed for updating. Map originals drawn directly by an automated system could for the first time be used in the production of a Swiss aeronautical chart. 9th edition: 1977, 10th edition: 1978, 11th edition: 1979.
- Radionavigation Chart (RNC) 1:1'000'000, 7th Edition 1977
- Chart of Air Navigation Obstructions 1:300'000, 10th edition: 1976 and 11th edition: 1978. Since October 1978 in view of the complete revision of the chart for the 1980/81 edition, all available information on obstacles is stored in a computer at the FOT. This will provide the AIS with a listing of obstacles and serve as a data bank for the automated production of the overprint originals by the Department of Cartography of ETH at Zurich.
- 1977, the 1:50'000 scale was introduced for the Visual Approach and Landing Charts (VAL) together with relief portrayal by means of hill-shading and a wooded areas overlay. The production of this series, now well-proven, is continued.

International Activities
The aeronautical charts conform to the specifications of Annex 4 to the Convention on International Civil Aviation (ICAO) and further, there exists an
Agreement between Austria, FRG and Switzerland on the Standardization of the Aeronautical Chart ICAO-1:500'000. The AIS attends ICA and ICAO activities in matters of aeronautical cartography.

Charts Produced by Non-governmental Agencies

As a complement to the official production, the following chart is to be mentioned:

Flugkarte der Schweiz, 1:300'000, edition 1978, publisher: Swiss Areo-Club. The FOA co-operates in the preparation of this chart through its AIS (compilation of the overprint).

(J.-F. Piller)

: map sample
ERKUNGEN

- RMK
- Nutzungsbefugnisse/Conditions of use: PPR
- Siehe/see AGA 3
- ON SR-FRI SS: Flugfeld für auswärtige Piloten gesperrt AD CLSD for visiting ACFT
- umgebende Räume/Areas to be avoided:

ICHUTUNGEN

- FACILITIES
  - 123.60 MHz
  - THUN FLUGPLATZ
  - ar R4 AVGAS

<table>
<thead>
<tr>
<th>Landung</th>
<th>Start</th>
<th>Belag</th>
<th>Tragfähigkeit</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>LDG DIST</td>
<td>TKOF DIST</td>
<td>SFC</td>
</tr>
</tbody>
</table>
Titel/title:   
Sichtanflug und Landekarte (VAL)-ICAO Serie  Visual Approach and Landing Chart (VAL)-ICAO Series  
Massstab/scale:   1:50 000  (aerodrome sketch 1:15 000)  
Erscheinungsjahr/Year of publication:   1979  
10 000 Exemplare  10 000 copies  
Herausgeber/publisher:   
Bundesamt für Zivilluftfahrt (BZL)  Federal Office for Civil Aviation (FOA)  
CH-3003 Bern  CH-3003 Bern  
Die VAL-Karten werden durch den Zentralen Luftfahrtinformationsdienst (AIS) des BZL bearbeitet und redigiert und sind Bestandteil des Luftfahrthandbuches der Schweiz (AIP). Die Elemente der Grundkarte werden der Landeskarte der Schweiz im gleichen Massstab entnommen.  The VAL Charts are compiled and edited by the Central Aeronautical Information Service (AIS) of FOA and are included in the Aeronautical Information Publication (AIP) of Switzerland. The base chart elements are taken from the Swiss National map in the same scale.  
Offsetdruck/Offset Printing:   
Bundesamt für Landestopographie  Topografic Survey of Switzerland  
CH-3084 Wabern  CH-3084 Wabern
La carte est l'un des principaux instruments de l'aménagiste. Rien de surprenant donc que l'établissement de cartes constitue pour lui un travail de routine. Ces cartes n'étant cependant le plus souvent pas d'intérêt public, elles ne sont publiées qu'en petit nombre.

Le 1er janvier 1980 entrera en vigueur la loi fédérale sur l'aménagement du territoire. La loi exige des cantons entre autres qu'ils établissent un plan directeur cantonal. Les plans directeurs servent d'instruments de coordination pour harmoniser les activités de la Confédération, des cantons et des communes qui ont des effets sur l'organisation du territoire. La loi précise que, dans l'établissement de leurs plans directeurs, les cantons doivent tenir compte des plans sectoriels de la Confédération, des plans directeurs des cantons voisins ainsi que des conceptions de développement et des plans existants. Il en résulte par conséquent l'obligation pour la Confédération de publier certains documents de base, par exemple sous forme de cartes et de plans thématiques. Selon leur destination, ces documents de base et les plans directeurs cantonaux seront mis à la disposition d'un public relativement étendu. C'est dans cet ordre d'idée que l'on peut s'attendre à une publication accrue au cours des années à venir de divers plans et cartes.

Ont été publiées à l'échelon fédéral depuis 1976 les bases d'aménagement cartographiques suivantes:

- 1977, Carte des régions de la Suisse menacées par les dangers naturels (état 1975), 22 feuilles, échelle 1:100'000.
- juin 1978, liste des installations de transports touristiques en Suisse (état 1976), avec carte à l'échelle 1:300'000 (état 1974).
- août 1977, carte des aptitudes climatiques pour l'agriculture en Suisse. L'ouvrage est accompagné de:
  - commentaire succinct de la méthode et du contenu de la carte
  - cartes des aptitudes climatiques pour l'agriculture, 4 feuilles à l'échelle 1:200'000
  - carte des aptitudes climatiques pour les céréales, échelle 1:500'000
  - carte des régimes pluviométriques, échelle 1:500'000
- mars 1977, niveaux thermiques de la Suisse. Sont joints à l'ouvrage:
  - commentaire sur la méthode utilisée pour l'établissement de la carte et de son contenu
  - cartes des niveaux thermiques de la Suisse, basées sur des observations phénologiques effectuées dans les années 1969 à 1973, 4 feuilles, échelle 1:200'000
  - carte montrant l'influence du foehn selon les régions, échelle 1:500'000.

Divers travaux cartographiques intéressant l'aménagement du territoire ont également été publiés à l'échelon cantonal et régional. Pour l'essentiel, il s'agit en l'occurrence de la présentation d'emplacements favorables à divers modes d'utilisation, tels que tourisme, industrie et agriculture, ainsi que de la présentation cartographique de relevés statistiques intéressant l'organisation du territoire et de plans relatifs à des paysages. Il est
In all cantons and most of the cities and regions planning offices exist, or
private firms (mainly architecture or planning bureaus) are charged with
planning works. Thereby they create a large number of maps as well for ba-
sic representations as for planning purposes specifically. But these maps
remain mostly in form of a manuscript map or are reproduced only in a small
edition.

A synophsis of such maps is given in the following publications:

B. Bürcher: Dokumentation zur überörtlichen Richtplanung in der Schweiz,
Studienunterlagen zur Orts-, Regional- und Landesplanung,
No. 39, September 1979, Institute for National, Regional
and Local Planning of the Federal Institute of Technology.
Zurich

H. Trachsler / H. Elsasser: Zum Stand der Schweizerischen Raumplanungs-

The map sample enclosed is an example of a basic map for cantonal planning
purposes (Editor: Division of Waterworks of the Canton of Berne; Printing:
Aerni-Leuch Co., Berne).
Hydrogéologie de la Vallée de Tavannes

1:50,000

1977

B. Schindler, Prêles; Dr. G. della Valle (WEA)

P. Eichwald, P. Kunz (WEA); D. Hofstetter, Rossens

Wasser- und Energiewirtschaftsamt des Kantons Bern (WEA)

Diaset AG Fotosatz, Bern
Aerni-Leuch AG, Bern

Auf der Grundlage eines Graudruckes des vollständigen Bildes der Landeskarte 1:50,000 werden die zwei wichtigsten Parameter für die Beurteilung eines Grundwasservorkommens dargestellt:

- die Lithologie und Durchlässigkeit des Grundwasserleiters durch neue Flächenfarben
- andere hydrogeologisch relevante Objekte wie Bohrungen, Schützegel usw., durch Strichsignaturen

Gravur (Stabilene Folie) der Flächenabgrenzungs-Linien; Additionskopie Linien und Flüsse; auf Cronaflexpositiv Montage der Strichsignaturen wie Schrift; Legende, Randüberschriften, Titel; Erstellung der Negativ-Tonwertrastermasken (Ulano-Maskierfilm) Blau 2, Gelb, Rosa; je Farbe eine Additionskopie (über Passlochstanze) mit gleichzeitiger Aufarsterung; Fünffarben-Offsetdruck nach der Europa-Skala inkl. Blau 1 (statt Schwarz) und Grau

The Hydrogeology of the Tavanne Valley

The Division of Waterworks of the Canton of Berne

Diaset Photographic Co., Berne
Aerni-Leuch Co., Berne

The two most important parameters for the evaluation of an aquifer are depicted on a grey print of the Swiss national topographic map (scale: 1:50,000) as follows:

- the lithology and the permeability are indicated in nine different colours;
- wells, alluvial fans and other relevant hydrogeological features are shown in bar test patterns

The surface demarcation lines and rivers are engraved on separate sheets of stabilene foil; the bar test patterns and the text, legends, marginal annotations and titles are done in cronaflex positive montage. Ulano negative screenmasking foil is used for grading blue 2, yellow and pink. Each additional copy per colour is centred over a guide-hole and the screens laid simultaneously. Five-colour offset is used in accordance with the European norm, including blue 1 (instead of black) and grey
The Swiss Geological Commission is responsible for the official geological map series of Switzerland. The institution is administratively attached to the Swiss Academy of Sciences, but gets its funds from the Federal Office of Education and Science.

The commission, seated in Basel, occupies three geologists and since 1978 two cartographers. The geological field work is done on a voluntary basis by many geologists.

The commission is editing the following map series:
- Geological map of Switzerland 1:500'000,
- Tectonic map of Switzerland 1:500'000,
- General geological map of Switzerland 1:200'000, 8 sheets (partly out of print)
- Geological Atlas of Switzerland 1:25'000
  scheduled number of sheets 230
  of that mapped and published 75 (33 %)
  in preparation 3 (1 %)
- Various single maps.

The maps are reproduced for the commission by the Federal Office of Topography and a private firm (Orell Füssli Graphical Arts, Zurich) and published by Kümmerly + Frey, Geographical Publishers, Bern.

The general map on the following page shows the state of publication of the Geological Atlas. A cutting from a map 1:25'000 is added to the map samples of the firm Orell Füssli Graphical Arts Ltd, Zurich.

The Swiss Geotechnique Commission, also an agency of the Swiss Academy of Sciences, is editing the following maps:
- Geotechnique map of Switzerland 1:200'000, four sheets
- Various single maps.
The Survey Department of the City of Zurich
Amtshaus V, Werdmühleplatz 3, CH-8023 Zürich

The Survey Department of the City of Zurich has, besides a strictly surveying function, also its own small Cartographic Department for smaller scale plan-work, smaller than cadastral maps. With 3-4 cartographers the department is minimally staffed relative to the work to be done. According to the workload, now and then private freelance cartographers are employed or, for simple representations, a survey-draftsman is assigned the task.

In close connection with cartography is the Reproduction Department. On one hand, this department is in charge of the facilities for gelatine-printing and diazo papers which are typical for the map-related reproduction work for the whole city administration. On the other hand, the Reproduction Department is very specifically oriented towards the cartographic needs of reproduction techniques. It is equipped with a reproduction camera and handles all contact proofs. Offset printing is done by other firms.

Emphasis of the cartographic work is the production and revision of large-scale topographic maps in original scale 1:2'500. This complete work consists of 57 sheets, each map face measures 48 x 72 cm, whereby at the outer sheets the map face stops at the city limits.

Presently a general renewal phase is about to be completed. Thereby, instead of the previously handwritten lettering, film-set lettering is used, and at the same time revisions have been made. In a further phase, the contour lines, which due to many revisions were no longer complete, will be totally replaced by photogrammetric plots. For the future, depending on the contents of each sheet, a revision cycle of 1-3 years is foreseen. Basis for the revision are the changes in the cadastral map.

The large-scale topographic map is also sold in a reduced 1:5'000 and in an enlarged 1:1'000 scale version.

The city map 1:20'000 is made contractually between the Survey Department of the City of Zurich and Orell Fussli Graphic Arts Company, Zurich, and is produced about every two years. While the Survey Department provides the revision information for the city area, Orell Fussli handles the production and printing. The map, together with a city-guide, is sold by Orell Fussli Publishing Co.

Based on the map 1:20'000, there are also scales 1:12'500 and 1:7'500 available.

The large-scale topographic map, as well as the city map 1:20'000 and the scales derived therefrom, make up an indispensible basis for large area projects, planning and thematic representations of the area of the City of Zurich. The primary users of these maps are official departments as well as engineering offices, companies, institutions and individuals.

All map information is available directly from the Survey Department of the City of Zurich

(W.Bantel)

2 map samples
Other Survey Departments

Similar cartographic work is performed in all larger cities in Switzerland, mainly in Basle, Berne and Geneva. Also, most of the Cantons have Survey Departments which are engaged in the production and reproduction of large scale topographic maps (see section 2.1) and mostly also of thematic maps for planning and public works (see page 32).
Übersichtsplan der Stadt Zürich, Blatt 24

Large-scale Chart of the City of Zurich, sheet: 24

1:2 500

1977

Vermessungsamt der Stadt Zürich

Kartographie und Reproduktionsabteilung des Vermessungsamtes der Stadt Zürich

Cartographic and Reproduction Division of Surveying Department of the City of Zurich

Offset

Offset


Topographic base with property boundaries, cadastral map with specific house numbers. Contours showing 2 meter intervals, selected auxiliary contours of 1 meter intervals, and altitudes. Various crosshatchings for normal buildings, cellars and attics.


Complete original divided into 5 part-originales. Existing chart as negative, revision of the linear topographic base by foil scribing, revision of the various crosshatchings and screens by negative strip foil with an overlay negative screen, revision of lettering as a negative from a positive film montage. Composite positive aligned by stud register system.
Titel/title: Linienplan der Verkehrs-
        betriebe der Stadt Zürich
        (Beispiel eines thema-
        tischen Plans auf besteh-
        den Plangrundlagen)  
Route map of the Transit
        Authority of the City of
        Zurich (Example of a the-
        matic map on an existing
        base map)

Maßstab/scale: 1:15000

Erscheinungsjahr/
        year of publication: 1978

Herausgeber/publisher: Verkehrsbetriebe der Stadt Zürich

Redaktionelle Bearbei-
        tungs des Themas/
        editorial work of theme: Verkehrsbetriebe der Stadt Zürich

Plangrundlage/basic map: Vergrößerung des Offiziellen Stadtplans Zürich
        1:20000, gemeinsam
        herausgegeben vom Ver-
        messungsamt der Stadt
        Zürich und der Orell Füssli
        Graphische Betriebe AG
        Zürich
Enlargement of the official
        city map of Zurich
        1:20,000, jointly produced
        by the Surveying Depart-
        ment of the City of Zurich
        and Orell Füssli Graphic
        Arts Ltd. Zurich

Originalherstellung
        und Druck/cartography and
        printing: Orell Füssli Graphische Betriebe AG Zürich

Inhalt/contents: Übersichtliche Darstellung
        sämtlicher Strassenbahn-
        und Buslinien der Ver-
        kehrs- 
        behinderung
        der Stadt
        Zürich in der Original-
        farbe der einzelnen
        Liniennummern. Hervor-
        heben aller Halte- und
        Umsteigestellen sowie
        der Bahnhöfe
Clear representation of the
        complete Tram and Bus
        routes of the Transit Au-
        thority of the City of
        Zurich, in original colours
        of the individual route
        numbers. Accentuation of
        all stops and transfer points
        as well as train stations

Originalherstellung-
        technik des Themas/
        thematic production
        technique: Sammelgravur des gesamten
        Liniennetzes. Aufteilen in
        einzelne Farbauszüge und
        Vereinigung mit den
        entsprechenden Farbauszügen der Plangrundlage.
        Erstellen der Positivfilme
        für den Vierfarben-Offset-
        druck mit Normalfarben
Combided scribing of the
        whole route system, divi-
        sion into individual colour
        separations and combina-
        tion with the appropriate
        colour separations of
        the basic map. Production
        of the positive films for
        4-colour Offset printing
        with standard colours
2.3 Private Cartographic Firms

Kümmerly + Frey Ltd. (Geographic Publishers, Cartography, Pringing, Boardings, Educational Material)
Hallerstrasse 6-10, CH-3001 Bern

Kümmerly + Frey has been founded by Gottfried Kümmerly in 1852. Today, it's a company which is specialized in different kinds of products. The editorial department and the cartographic section are producing all kinds of maps as well as geographic and environment-oriented literature. The main activities of the company are consecrated to the European market. Furthermore special products according to customers wishes are also produced by Kümmerly + Frey.

The company has approximately 250 employees. 40 of them are working at the cartographic section to which is also affiliated a training section for apprentices. Two masters are taking care of about 8 apprentices. Approximately 25 % resp. 40 % of their working time these two masters are using for the training of these young people. Since 1976-1980 the company will have formed 12 boys and girls to professional cartographers. During the last 4 years and while writing this report, 118 adolescents have asked to visit our company for information purposes and 57 of them went through a 2 days practical test.

Since 1976 our company has published the following remarkable map works:
27 town maps of smaller and bigger Swiss towns on scales 1:8'000 to 1:18'000.
20 excursion and hiking maps of various Swiss regions on scales 1:25'000 and 1:50'000 on the basis of the national map.
3 school maps for the cantons of Geneva, Berne and Lucerne in the famous Swiss hill shading manner. On the reverse side of 2 school maps are shown satellite pictures, birds-eye view pictures, map examples of the topographic field and thematic maps.
16 new road maps like e.g. 3 sheets of a series Germany 1:250'000, Netherlands and Belgium 1:300'000, Portugal and Spain 1:500'000 in 4 sheets, Finland 1:1 mio., Tunisia and Morocco 1:1 mio.

Various thematic map works like e.g. 7 regions of Switzerland "leisure and holidays" on scale 1:250'000, energy map of Switzerland 1:600'000, series of birds-eye maps of Switzerland, satellite picture of Switzerland, map and atlas of Austria for leisure and holidays, pocket world atlas, world animal map 1:50 mio., maps for bibles, continental maps of the USA 1:4 mio., Central America 1:5 mio., Canada 1:5,3 mio., Mediterranean Sea 1:4 mio., China 1:5 mio. "The earth - the nature - the human being - the economy" 1:32 mio. as a thematic map and the world map 1:28 mio. with Mercator projection and new presentation of the vegetation.

1969 we began to store geographic names on a data bank. During the last 4 years this has been completed and improved. Today this data bank contains the names of our entire assortment of European road maps. Actually, there are about 100'000 names recorded on discs, provided with country code, number of identification, language code, names with special signs, geographic coordinates, classification of localities and partly their zip-codes, indication of scale and other attributes. With this data bank and its corresponding programs we are able to recall either the names of a country, or of a determined map section as also of a double page in a road atlas. Directed
by a magnetic tape, the names are classified alphabetically on a photo-
composer and, according to the grid on the map, with its bingo made up
ready on pages and exposed onto film strips.

With much interest the company is observing the development of automatic
drafting systems. First steps have already been made in this field to-
gether with the Swiss Federal Institute of Technology in Zurich. New pro-
jection networks have been developed for continental and country maps,
which are exposed with the optical exposure head onto photographic film
on the Ferranti plotter as narrow-meshed working grids and definite map
grids. The result is a precious basis for the cartographer for the out-
line of a new map.

As to the conventional cartographic working techniques, our company star-
ted doing colour instead of black-and-white originals for the hill-sha-
ding. A problem of the colour original is actually its reproduction in 4
colours, since suitable big-size colour scanners are not enough developed
yet.

(K. Ficker)

2 map samples
Strassenkarte Marokko
Road Map of Morocco

1:1000000

Kümmerly+Frey, Bern / Berne

Relief mit Vegetationsdarstellung (Sandwüste, Steinwüste, Ödland, Grassteppe, Intensivkulturland, Buschwald, Hochwald).
Roads with road numbers and distances, railways, car ferries and shipping routes, objects of interest, tourist amenities, oasis, wells etc.

Hill shading with presentation of vegetation (sandy desert, stony desert, unproductive area, steppe, intensive cultivated area, degraded forest, forest).

Reproduktion / Reproduction

Lineares Kartenbild in den üblichen kartographischen Zeichentechniken.
Reliefbild anhand von Satellitenbildern als Farboroiginal hergestellt und zusammen mit dem linearen Bild in 4 Farben reproduziert.

Linework in conventional cartographic reproduction techniques.

Representation of relief produced as colour image with the aid of satellite images, copied together with the linework and reproduced in 4 standard colours.

Strassenkarte USA
Road Map of United States of America

1:4000000

Kümmerly+Frey, Bern / Berne

Strassen in 4 Klassen, Bahnen, Grenzen, Orte, Flughäfen, Hafennorte, Nationalparks usw.
Relief mit Vegetationsdarstellung (Wüste, Buschland, Grasland, Kulturland, Intensivkulturland, Wald).

Roads in 4 categories, railways, boundaries, localities, airports, sea ports, national parks etc.

Hill shading with presentation of vegetation (desert, shrubland, grazingland, cropland, intensive cultivated area, forest).

Reproduktion / Reproduction

Lineares Kartenbild in den üblichen kartographischen Zeichentechniken.
Relief anhand von einfarbigem Original, Kolorit anhand eines Farborginals in total 5 Farben reproduziert.

Linework in conventional cartographic reproduction techniques.

Relief on the basis of a monochrome original, colouring on the basis of a colour original reproduced in 5 colours total.
This firm was founded early in the sixteenth century and is one of the oldest printing and publishing houses in Switzerland. Today approximately 630 persons are employed in the various branches such as the book and magazine publishing house, the bookshop, the geographical publishing section, bank-note and bond printing department as well as the printing department for general publications and books. The company is one of the largest printing establishments in the country.

The highly specialized cartography department, with more than 55 years of experience and approximately 30 employees, produces all types of maps, both for its own geographical publishing section, as well as for a large number of customers. Atlases, geographical maps for educational purposes, relief maps, geological maps and city guides are produced in particular, in addition to other special maps and plans.

During the period 1976 - 1980, the following atlases, maps and plans of Switzerland were published or produced for customers:


14 maps for walking tours, 14 new town and city guides and 8 which were updated, 1 city map atlas for the region around Zürich - including 57 communities, 5 school maps, 7 planning maps, 1 nature conservation inventory, 3 road maps 1:350'000, 1:600'000, 1:900'000. Also a large number of advertising maps and city guides.

The cartography department has its own apprenticeship section where there are always 4 to 6 apprentices being trained.

In the reproduction sector, all the facilities of a modern, large firm are available to the cartography department, e.g. large cameras for precision and screen photos, contact copying instruments and developing machines. In addition, there is also a sheet copying department to meet the special demands associated with the copying of negatives and positives. All work is processed with stud register systems.

In the printing field, modern high-efficiency offset machines ensure the necessary quality and accuracy, in addition to optimum printing performance.

(G. Merkle)

4 map samples
Swissair Photo + Surveys Ltd. (Aerial Photography, Surveying, Photogrammetry)
Obstgartenstrasse 7, CH-8035 Zürich

Since 1949 the company is engaged in the establishment of photogrammetric plans and maps as well as in geodetic surveys (triangulation, tunnel stake-outs, cadastral surveys etc). Since 1959 aerial photography with specially equipped survey aircrafts has been added to its activities, which at the same time have been extended to foreign countries.

Oblique aerial photographs of landscapes are being sold for wall decorations, book illustrations and advertising purposes as an additional service to the public.

A modern and very efficient photo-laboratory and reproduction unit plays an important part in the firms activity.

The company employs 100 engineers, cartographers and draftsmen, whereof 12 in the cartography and drafting department alone.

Their main activity is centred in the photogrammetric restitution and its graphic follow-up to produce one- or multicoloured plans and maps 1:200 to 1:50'000.

Great efforts are being made to compete successfully on the international scene. Mapping projects were realised e.g. in Egypt, Indonesia, Nepal, Honduras, Togo, Gabun, Libya, Greece and Saudi Arabia.

(W.Altherr)
Titel/title: Schulkarte der Schweiz (Sonderausgabe)  School map of Switzerland (Special issue)

Massstab/scale: 1:500 000

Erscheinungsjahr/year of publication: 1979

Autor/author: Orell Füssli Graphische Betriebe AG, Zürich

Kartographische Bearbeitung/cartography: Orell Füssli Graphische Betriebe AG, Zürich

Herausgeber/publisher: Geographischer Verlag der Orell Füssli Graphische Betriebe AG, Zürich

Druck/printing: Orell Füssli Graphische Betriebe AG, Zürich

Inhalt/content: Topographische Übersicht der Schweiz und angrenzender Länder in schattenplastischer Manier (Schweizer Manier)  Topographic map of Switzerland and neighbouring countries with terrain representation in the Swiss style

Reproduktion/reproduction: Entwurf, Generalisierung und Originalzeichnung auf der Grundlage der Landeskarte 1:100 000, photogr. Reduktion auf 1:500 000, Montage und Stripmaskverfahren, 6 Druckfarben, Offsetdruck  Layout, generalization and fair drafting based on the official map series of Switzerland 1:100,000 photographic reduction to 1:500,000, sheet assembling and strip-masking process, 6 colours, offset-printing
Titel/title: Strassenkarte Schweiz

Massstab/scale: 1:350 000

Erscheinungsjahr/year of publication: 1976

Autor/author: Orell Füssli Graphische Betriebe AG, Zürich

Kartographische Bearbeitung/cartography: Orell Füssli Graphische Betriebe AG, Zürich

Herausgeber/publisher: Geographischer Verlag der Orell Füssli Graphische Betriebe AG, Zürich

Druck/printing: Orell Füssli Graphische Betriebe AG, Zürich

Inhalt/content: Darstellung des klassifizierten Strassennetzes der Schweiz und angrenzender Länder. Reliefzeichnung in schattenplastischer Manier mit Walddarstellung

Reproduktion/reproduction: Farbiger Entwurf und Generalisierung im Masstab 1:200 000, photographische Reduktion auf 1:350 000, Foliengravur, Stripmaskverfahren und Montage, 6 Druckfarben, Offsetdruck

Road map of Switzerland

Representation of the classified road network of Switzerland and neighbouring countries, with terrain and forest representations

Coloured layout and generalization based on the official map series of Switzerland, 1:200,000, photographic reduction to 1:350,000, foil-stripping, strip-masking process and sheet assembling. 6 colours, offset printing
Titel/title: Geologischer Atlas der Schweiz Blatt Bellinzona
Geological Atlas of Switzerland, sheet: Bellinzona

Maßstab/scale: 1:25 000

Erscheinungsjahr/year of publication: 1974


Kartographische Bearbeitung/cartography: Orell Füssli Graphische Betriebe AG, Zürich

Herausgeber/publisher: Schweizerische Geologische Kommission, Basel

Druck/printing: Orell Füssli Graphische Betriebe AG, Zürich

Inhalt/content: Darstellung der geologischen und tektonischen Gegebenheiten
Repräsentation of the geological and tectonic conditions

Reproduktion/reproduction: Topographische Grundlage: Landeskarte der Schweiz 1:25 000, Schichtgravur der Farbkonturen, Zeichnung und Filmmontage der geolog. Informationen, Herstellung der Ge steinsfarbgebung mittels Stripverfahren und Rasterkopiertechnik. 16 Druckfarben, synthetisches Papier "Syntosil", Zweifarbenoffsetdruck
Topographic base: Official map series of Switzerland 1:25,000, Scribing of the colour contours, drawing and sheet assembling of the geological information. Preparing of the colour plates to represent the various types of rocks using the strip method and screen copying technique. 16 colours, synthetic paper "Syntosil", two-colour-offset printing
Titel/title: OF-Stadtplan Zürich

Massstab/scale: 1:20 000

Erscheinungsjahr/year of publication: 1976

Autor/author: Orell Füssli Graphische Betriebe AG Zürich

Kart. Bearbeitung/cartography: Orell Füssli Graphische Betriebe AG Zürich

Herausgeber/publisher: Orell Füssli Graphische Betriebe AG in Zusammenarbeit mit dem Vermessungsamt der Stadt Zürich

Druck/printing: Orell Füssli Graphische Betriebe AG Zürich


Reproduktion/reproduction: Reinzeichnung auf Astrafoil, Farbgebung mittels Stripverfahren und Rasterkopiertechnik, 4 Druckfarben.

Presentation of the streetnetwork of the City, with annotation of the important buildings and the public transport system.

Fair drafting on Astrafoil, preparing of the colour plates using the strip method and screen copying technique, 4 colours.
The firm employs 700 persons, of whom 16 work in the cartography section. Hallwag AG operates in the following production areas:
Newspapers, periodicals, books, travel guides, maps and prints for customers.

Technical modernization has played an important role in the firm's recent development: Printing is fully electronic, the "Digiset" System. Scanners, Roll-offset presses are used, with the aim of streamlining the production methods with accuracy and efficiency. The benefits of these improvements are reflected, as elsewhere, in map-making.

In the cartography section the emphasis is on the production and sale of road-maps, but town-plans; road atlases and continent maps are important parts of the work routine. The geographical framework of the sector's activities can truly be designated as international.

A specialized group (see above) is responsible for the work of the cartography department, working in cooperation with other map-making firms.

In the years 1976-1980, in this way, the following new maps were issued:
8 road-maps 1:400'000 to 1:1'000'000
3 pocket-atlases
4 town-plans
2 continent maps 1:4'000'000 and 1:9'000'000
2 panorama maps
2 regional maps 1:150'000 and 1:200'000
5 hiking maps 1:50'000

(Dr.Ch. Herrmann)

3 map samples
<p>| Titel/title: | Panoramakarte der Schweiz | Panoramic map of Switzerland |
| Massstab/scale: | Mittelgrund ca. 1:300 000 | To average about 1:300 000 |
| Erscheinungsjahr/year of publication: | 1978 |
| Autor-Zeichner/author-artist: | Franz Stummvoll, Lanz-Österreich/Austria |
| Kartograph. Bearbeitung/cartography: | Hallwag AG, Bern-Schweiz/Switzerland |
| Herausgeber/publisher: | Hallwag AG, Bern-Schweiz/Switzerland |
| Druck/printing: | Hallwag AG, Bern-Schweiz/Switzerland |</p>
<table>
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<tr>
<th>Titel/title:</th>
<th>Stadtplan Kopenhagen</th>
<th>City map Copenhagen</th>
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<tr>
<td>Massstab/scale:</td>
<td>Hauptplan 1:20 000</td>
<td>Main map 1:20 000</td>
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<td></td>
<td>Zentrumplan 1:15 000</td>
<td>Map of the centre 1:15 000</td>
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<td>Umgebungskarte</td>
<td>Map of the neighbourhood 1:250 000</td>
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<td>Erscheinungsjahr/year of publication:</td>
<td>1979</td>
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<tr>
<td>Autor/author:</td>
<td>Hallwag AG, Bern-Schweiz/Switzerland</td>
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<td>Hallwag AG, Bern-Schweiz/Switzerland</td>
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<td>Druck/printing:</td>
<td>Hallwag AG, Bern-Schweiz/Switzerland</td>
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</table>
Titel/title: Strassenkarte Dänemark/Road map of Denmark

Massstab/scale: 1:400 000

Erscheinungsjahr/year of publication: 1979

Autor/author: Hallwag AG, Bern-Schweiz/Switzerland

Kartograph. Bearbeitung/cartography: Hallwag AG, Bern-Schweiz/Switzerland

Herausgeber/publisher: Hallwag AG, Bern-Schweiz/Switzerland

Druck/printing: Hallwag AG, Bern-Schweiz/Switzerland

Inhalt/contents: Gebiet von Dänemark und angrenzende Gebiete; Göteborg bis Hamburg.

Territory of Denmark with adjoining regions; from Göteborg to Hamburg.

Herstellung — Reproduktion/production — reproduction:

Normaler kartographischer Aufbau über Gravurfolie, Film, Folien, Strippingfilme etc. Teilweise spätere Weiterverarbeitung über Folienkopie.

Vierfarben-Offsetdruck mit Spezialfarbskala.

Based on a normal cartographic construction (engraving-foil, film, foils, stripping-film etc.). Partly later on processing by foiles-copy.

Four colour-offset print with special colour-scale.
For many years the main emphasis was on the cartographic processing of evaluated air survey photographs for producing the 1:10'000 topographic map. In recent years the firm has turned increasingly to mapmaking for publication, and has produced town maps, topographical and special-subject maps for publishing houses and public bodies. Between 1976 and 1980 the firm has issued 2 town maps and 7 topographical maps.

The business is divided into three departments: cartography, reprography and phototypesetting, with a skilled staff of 12.

In the cartography department the maps are planned, edited and executed on a teamwork basis. Ideas developed within the firm are aimed at rationalized production of maps that use few colour plates and are easy to update. The various elements of the map are engraved separately and in exact register onto cartographic scribe film, in accordance with a carefully thought-out index of originals. No cutouts or interruptions are made on the originals. All lines are continuous throughout (of great benefit when updating later). Relief shading is airbrushed in colour and the colour separations are prepared by scanner. Register marks are engraved with a coordinatograph to an accuracy of 0.02 mm over 1 m. Cutout masks are cut with the same precision.

The reprographic methods are particularly varied. The reference copies are prepared on yellow scribe film, using a multicolour process. Reference copies on film for montages are produced by photolysis, nomenclatures and symbols are mounted with diazostripping. Contours for masks and overlays are etched on masking film, the lines usually being masked before peeling. The peeled areas are then widened to the required size by the contact method.

For multiple additions the negative copying method has been used for 15 years. A special system of register perforations is used throughout from production of the original up to the offsetfilm, and ensures unusually high precision. Lines and area-type symbols are isolated photomechanically, as also are cutouts in raster surfaces, without subsequent retouching. Maps in any number of versions can be produced with the same component originals. Updating is easier and more accurate. Time-consuming retouching by hand and matching to the individual colour separations are no longer necessary. Small editions are produced on opaque or transparent dimensionally stable polyester film, using a multicolour process.

Specialities include reprographic modifications, such as uniform thickening of lines, resolution of field-in features into outlines, and optical distortions of all kinds.

The phototypesetting department produces lettering and type for publishers and authorities, using electronic and computer-controlled equipment with facilities for making corrections on monitors. A choice of 200 typefaces is available.

1 map sample
Smaller Firms and Private Cartographers

Besides the particularly mentioned firms in the preceding chapters, some more smaller firms exist in Switzerland which edit and publish maps.

In addition, a number of freelance cartographers work on their own account. They receive work orders mainly from official agencies (like Federal Office of Civil Aviation or Federal Office of Regional Planning) and the bigger private firms.
Topographische Karte 1:50 000 mit mehrfarbiger Reliefschummerung

Kartographie: Schad + Frey AG, Kartographisches Institut, CH-3018 Bern
Druck: 5 farbig, Europaskala und braun (Höhenkurven und Felsen)


Topographical map 1:50 000 with multi-colour relief shading

Cartography: Schad + Frey AG, Kartographisches Institut, CH-3018 Berne
Printing: 5 colours, European scale and brown (contours and cliffs)
2.4 Equipment Manufacturers

Wild Heerbrugg Ltd. (Geodetic and Photogrammetric Instruments)
CH-9435 Heerbrugg

The domicile of this company, founded in 1921, is in the Rhine Valley, Canton of St.Gall. Approximately 4000 people are employed in the whole organization. Mechanical, optical and electronic equipment and systems are manufactured in the factories in Switzerland, Europe and abroad for use in the fields of surveying, microscopy and for special applications. Wild products enjoy a world-wide reputation for their quality, precision and universality.

The relations to cartography exist mainly through the disciplines of Geodesy and Photogrammetry which provide the basic information for the production of maps and plans. From the extensive range of equipment which the Wild company offers for surveying and mapping tasks only some of the most outstanding instruments introduced on the market in the past four years can be mentioned here.

In the sector of geodetic equipment the electronic reduction tacheometer Tachymat TC 1 is a milestone in development. This instrument for infra-red distance measurements combined with electronic angle-measuring facilities provides for the display of inclined and horizontal distances, horizontal and vertical angles as well as for height differences, heights above sea level and for the coordinates of target points already in the field. These data can also be recorded on a magnetic tape cassette.

In photogrammetry new high-performance lenses for the RC 10 Aviophot System increased the economy further by higher resolution in the visible and near infra-red range of the spectrum. With this performance the needs for better colour and false colour for photo-interpretation could be satisfied.

A new generation of stereoplotting equipment, known as the Aviormap system, appeared on the market in 1976/77. Besides the application of modern technology (air bearings for moving parts) the connected electronic plotting table Aviotab TA should be of interest to cartographers. In times of digital terrain models it can also be used as a stand-alone unit when connected to a computer with the available intelligent microprocessor interface. With this combination and suitable software, drawings, plans and maps can be plotted automatically.

Remarkable progress was made in the field of orthophoto technology which gained increasing importance for map production and revision. The new Universal Orthophoto Instrument Aviplan OR 1 is equipped with an optical projection system controlled by a process computer and applies the principle of differential rectification of first order. Aerial photographs are distorted due to central projection when the camera axis is not vertical and/or the terrain is not a horizontal plane. These effects are eliminated without mismatches or gaps by a continuous rotation and change of scale of an infinity of image line elements which are arranged in parallel profiles of selectable width. The result is a photographic product (orthophotograph) of uniform scale, with a basic enlargement of up to six times (under certain circumstances even higher). The digital terrain information indispensable for
the rectification will either be obtained from a stereophotogrammetric plotting instrument or from contours digitized from existing maps or plans. A software package developed in cooperation with the Technical University of Vienna provides for the necessary input data for the OR 1 instrument.

Several computer programs have extended the range of application of the OR 1 in recent times. So it is now possible to produce not only orthophotographs but also the so-called stereopartners, both, in black-and-white and in colour. These are artificially distorted photographic products which allow spatial perception (and measurement) when viewed stereoscopically.

A further application, undoubtedly of particular interest to cartographers, lies in the reversal of the rectification principle. What can be rectified can also be distorted, provided the (mathematical) laws of desired distortions are given. As an example the transformation of a map from one map projection to another should be mentioned. A practical test was recently carried out with success. The (coloured) Aeronautical Chart ICAO 1:500'000, map sheet 2253-B Switzerland, is a conformal conical projection (Lambert projection No. 1). It had to be transformed into a (coloured) rectangular Cassini-projection 1:1'000'000 for later use in the display unit of an inertial navigation system. By digital differential projection in the OR 1 the meridians (convergent straight lines) and the parallels (concentric circles) were transformed into a rectangular coordinate grid of specified mesh width. The residual RMS for the coordinates in the Cassini-projection amounted to ±0.08 mm. Further tests with other types of map transformations are planned.

Finally it should be mentioned that Wild Heerbrugg Ltd observes very carefully the development of interactive graphic mapping systems.

(G.E. Bormann)

Other Equipment Firms

Several other firms for geodetic/photogrammetric equipment, cartographic tools and materials, and even for computer-assisted design systems exist in Switzerland, but unfortunately no more reports were received.
2.5  University Departments

Department of Cartography of the Swiss Federal Institute of Technology (ETH),
ETH Hönggerberg, CH-8093 Zürich

In 1976 the department celebrated its 50th anniversary. At the same time the
new facilities on the Hönggerberg were inaugurated, by the way in presence
of the founder of this institution, Professor Dr.Ed. Imhof. The department
has to organize a number of cartography courses, research and development
projects, as well as to execute various services for other institutions. The
team of the department is directed by a professor and consists of two engi-
ners, an analyst-programmer, a reproduction specialist, four cartographers
and a secretariat. The department has at its disposal a small library and a
map collection, a well-equipped reproduction laboratory and an interactive
graphic system with a cartographic master plotter.

The syllabuses consist of an introduction to drafting and design for civil
engineers and the following cartographic courses for surveying engineers
and geographers:
- Basic elements of cartography, a course in general map design,
- Topographic cartography, a complementary course that concentrates on
terrain representation,
- Thematic cartography, with applications of map representation principles
to various subjects,
- Map compilation and cartographic techniques,
- Special cartographic reproduction techniques,
- Practical cartographic laboratory work.

All these courses are combined with exercise work, starting with small pro-
jects and ending with larger ones, in which complete printing films ready
for reproduction are prepared.

Most of these subjects are in correlation with problems that arise from re-
search and development work. The department is free to choose projects of
its own interest. So we studied e.g. problems of orthophoto and satellite
imagery reproduction with improved representation of small details. The in-
teractive graphic system serves for the preparation of a digital topogra-
phical data base for Switzerland. In a number of experiments various appli-
cations are tested. Other projects are in close connection with interna-
tional commissions of the ICA and the OEEPE, so e.g. the editing of a manual
on cartographic techniques or controlled experiments on different revision
processes for topographic maps at 1:25'000 by photogrammetry.

A quite remarkable task of the department is the editing of the Atlas of
Switzerland. Recently we have been charged by the Federal Government with
a continuing revision of this national atlas. All the map compilation work
is done by a small group of the department. The reproduction is executed
by the Swiss Federal Office of Topography. Some printing films are however
produced on the interactive graphic system. A programm package called DIA-
MANT has been developed for the preparation of diagramm maps from statisti-
cal data. The final films are exposed by the light spot projector of the
flatbed plotter. The preparation of the first delivery of the second edition
of this atlas has already well advanced.
Some other production makes use of the computer-assisted cartography system. The database of the aeronautical information of the ICAO-map of Switzerland is constantly up-dated. Annually a new edition is published for which final films and guide images are prepared on the system. Part of this information is used also for other types of maps. Map projection grids and coast line images with hydrography for small scale maps are prepared too on the system. These contracts are a very valuable assessment for our research work, but because of the lack of personnel no major expansion of these services will be possible.

The department does not publish any larger maps. Some samples of experimental maps are to be found in the annex to this report.

(Prof. E. Spiess)

4 map samples
Farbige Wiedergabe eines Schwarz-Weiss-Orthophotos in kombinerter Raster- und Kornstruktur
 Höhenkurven mit 20 und 40 m Aequidistanz

Farbige Wiedergabe eines Schwarz-Weiss-Orthophotos in Kornstruktur;
Veränderungen des Gletschers zwischen 1965 und 1974, dargestellt durch horizontale Schnittflächen mit 40 m Aequidistanz

- Zunahme der Gletscherdicke
- Abnahme der Gletscherdicke

Höhenkurven 1965
Höhenkurven 1974
Orthophotokarte
Allalingletscher
(Kartenprobe)

Orthophotomap
Allalin Glacier
(Experimental map)

Scale: 1:10 000

Year of publication: 1980

Authors: A. Bichsel, E. Menet

Cartography: A. Bichsel and E. Menet and Mitarbeiter des Institutes

Publisher: Institut für Kartographie ETH Zürich

Druck: Photographic image conversion of an orthophoto annotated with contour lines and areas showing their movement in the period 1965–74.

Printing: Fotorotar AG, Egg ZH


Titel: LANDSAT-Karte des Raumes Luzern-Zürich

Title: LANDSAT-Map of the Region Lucerne-Zurich

Maßstab: 1 : 500 000

Year of publication: 1980

Verfasser: F. Widmer, F. Schneider, K. Bigler

Authors: F. Widmer, F. Schneider, K. Bigler

Kartograf. Bearbeitung: Institut für Kartographie ETH Zürich

Department of Cartography, Swiss Federal Institute of Technology Zurich

Druck: Fotoror AG, Egg ZH

Reproduktion: Transformation of the LANDSAT-negatives of April 17, 1976 by reproduction processes and cartographic annotation

Inhalt: Reprotechnische Umarbeitung der Negative der LANDSAT-Aufnahme vom 17. April 1976, kartografisch ergänzt.

Content: The following printing colours were chosen for rendering the various channels of the LANDSAT-imagery: Channel 7 for cyan, channel 4 for yellow and channel 5 for magenta. These images have been adjusted by masking processes with the idea to achieve a general impression of natural colours. In the snow and glacier areas and shadows yellow and magenta had to be eliminated or reduced. These modified continuous-tone colour separation negatives were screened with a 60 lines per cm contact screen. Roads, railways and settlement boundaries were scribed on the base of map guide lines and combined with some names for the black plate. Four-colour offset printing with standard colours.


Insbesondere wurde darauf geachtet, dass in den Schneeflächen und Schneebetten Magenta und Gelb zurücktraten. Die so präparierten Halbleiternegativauszüge wurden schliesslich in 60L/cm Rasterweite im Kontakt zu Rasterpositiven aufgerastert.

Die Strassen, Bahnen und Siedlungsgrenzen wurden nach Kartengrundlagen geviertelt und mit einigen Ortsspielen zur Schwarzeplatte kombiniert.

Offsetdruck mit Normalfarben.
Kulturlandschaftswandel im Raume Flughafen Kloten von 1940 bis 1976

Changes in the region of the airport Kloten in the period 1940 - 1976

1 : 25 000

A group of geography students under the direction of Prof. E. Spiess
the above and collaborators of the department

Fotorotec AG., Egg ZH


The map of the Topographic Atlas shows the situation in 1940, the National Map of 1970, completed by some additional photogrammetric plottings of 1976. New planimetric elements are represented in red and those that disappeared in the meantime in grey or light blue.


From the existing colour plates selected parts were extracted with help of masks and combined to new colour separation films for the seven-colour map. The last changes were scribed and equally added. Printing was done in offset with the colours black, cyan, yellow, red, green, grey and a dark blue.
Ausländische Wohnbevölkerung nach Heimatstaaten im Raume Zürich 1979

Foreign population by nationality in the region of Zurich in 1979

1 : 200 000

1980

John E. Bartholomew

Department of Cartography, Swiss Federal Institute of Technology Zurich

Fotorotar AG, Egg ZH

Im Rahmen der Uebungen in thematischer Kartographie wurde die ausländische Wohnbevölkerung in den Gemeinden rund um Zürich in Konsenskatasterdiagramm dargestellt. Der Anteil der Ausländer an der Gesambevölkerung wurde mit gestuften Flächenfarben sichtbar gemacht.

The subject chosen for representation in the laboratory work in thematic mapping, was the foreign population in some communities around Zurich.

Their absolute number was given by proportional circles and divided by percentages according to origin.

The total ratio of foreigners is represented by graded tints.

Einige Entwürfe zur Auswahl wurden mit Hilfe des Programmes THEMAP geplottet. Die Konturen für die endgültige Version wurden in Tusche gezeichnet, die Masken für die Sektorenflächen in Folie geschnitten, diejenigen für die Gemeindeflächen mit Hilfe von Strupp kopien erstellt und die gesetzte Beschriftung montiert. Von all diesen Grundliegen wurden Vielfarben aufzüge zusammengespott, Vielfarben-Offsetdruck mit Normalfarben.

A number of plans were produced with the program THEMAP for selection. The outlines for the final version were drawn in ink, cut-and-peel masks were prepared for each sector of the divided circles, stripping masks were copied and pasted for the communities, photo-composed names were mounted on film. From these masters four-colour separation films were composed by contact-copying. Four-colour offset printing with standard colours.
Wassergütekarte der Schweiz
Zustand der Fliessgewässer 74/75

Redaktion und Kartenbearbeitung:
Kultur- und vermessungstechnisches Seminar WS 1978/79
Leitung: F. Chaperon, E. Spiess, E. Trüeb
Herausgeber: Institut für Kartographie ETHZ
Quellen: Eidg. Anstalt für Wasserversorgung,
Abwasserreinigung und Gewässerschutz
Quality of the Water in Swiss Rivers

(Experimental map)

1: 300,000

1979

F. Chaperon, E. Trueb, E. Spiess

A group of students of the Swiss Federal Institute of Technology and collaborators of the Department of Cartography

Fotonor AG, Egg ZH

The rivers are differentiated by the quantity of water according to a macroindex in four grades. The chemical aspect of the analysed water is shown quantitatively for each test area.

The wing diagrams have been calculated and placed with the program DIAMANT. The outlines of the diagrams were exposed on film with the light spot projector of the cartographic masterplotter. Cut-and-pee masks were prepared with the machine for all four sectors. Additional cut-and-pee masks were produced manually for the river bands. Using these masks, the four colour separation films were screened. Four-colour offset printing with standard colours.
Various activities of the quantitative group within the Department of Geography, Federal Institute of Technology (ETH), Zürich, have converged during the last few years to the development of a general geographical data processing system. The major hardware components are a general purpose minicomputer (PDP 11/40), a special purpose display computer (Ramtek GX-100B) with a video lookup table and a raster color monitor and a map digitizer (D-MAC Pencil Follower).

The system can handle image, map and statistical data and uses three different data file formats, each appropriate for storing a particular kind of data: (1) raster format (for original image data already in digital form or for raster-scanned images and maps); (2) vector format (for graphical information obtained by digitizing points or lines on the map digitizer or on the raster screen; (3) serial format (for statistical data such as census data, for example).

The basic software consists of two systems designed for interactive use. The user has a number of different functions available that can be called in any sequence (with some exceptions). One, an image display and manipulation system (called ZAR) is complete and operational. It is geared to the handling of raster as well as vector data. Actual computations are kept to a minimum, while heavy use is made of the video lookup table facility. It works as follows: the data values coming from the file become addresses in the table. At each address a code is stored which generates a certain color combination on the monitor. Consequently, by changing the content of the video lookup table it is possible to show the same data in different ways. The second software system is under development. It is attached to the serial data format, does statistical calculations and produces graphical and map output on the color display. For mapping output a raster file is produced which can be manipulated by the ZAR system. For example, to show census data in map form, one assembles a raster file which contains an administrative base map. Each raster cell carries a number which identifies it as belonging to a particular administrative unit. These numbers now become addresses in the video lookup table. To show a map of a particular census variable the table content is derived from the data values that the administrative units have for the variables in question. In this way it is possible to switch rapidly from one attribute to another by simply changing the table content. Two - or three - variable combinations are also possible.

Several special projects are in progress, including

(1) the matching of multispectral scanner data to a map base for the purpose of updating the land use information in the Swiss Planning Information System (Ph.D. thesis H.Gilgen);

(2) the preparation of geometrically correct (e.g., information system data) or corrected raster data (e.g., transformed multispectral image data) for subsequent statistical processing by overlaying area boundary information obtained by map digitization (Ph.D. thesis G.Lenz);
(3) the interactive determination of parameters for the classification of multidimensional data by evaluating value distributions projected into two- or three-dimensional spaces (Ph.D. thesis E. Blum);

(4) the use of the ZAR system and the video lookup table facility for dynamic display of census information and for the presentation of interaction data (Ph.D. thesis B. Flury);

(5) the establishment of a digital terrain model for the area of Grindelwald from raster-scanned contour line transparencies, using a combination of interactive editing work on the color display and batch processing on the large computer (part of the Swiss MAB project).

(Prof. Dr. D. Steiner)
Institute for National, Regional and Local Planning (ORL-Institute) of the
Swiss Federal Institute of Technology (ETH)
ETH-Hönggerberg, CH-8093 Zürich

The ORL-Institute is not involved in research work and teaching in cartography, but it tries to activate the cooperation between cartographers and planners. In this connection the following publications have to be mentioned:

- Bernath Hans Jakob und Elsasser Hans: Kartographische Darstellungsprobleme in der Raumplanung. DISP Nr. 40, ORL-Institut ETH Zürich 1976
- Elsasser Hans: Gruppenbildung und Wahl der Bezugsflächen bei der kartographischen Darstellung von raumplanerischen Daten. KTBL-Arbeitsblatt Nr. 3031, Darmstadt 1977

The last article dealing with cartography for planning in Switzerland shows what planners expect from thematic cartography, in addition it provides a general view about thematic maps and standards for graphic representation which have been elaborated by the planning offices of the various Cantons. The article gives also some information about possibilities for cartographers to work in the field of planning.

In connection with various research projects the following thematic maps have been published:

- Reisezeit-Isochronen für 13 Hauptzentren und Reisezeit-Isochronen für 56 Mittelzentren 1:300'000
  Heer Ernst: Reisezeiten zu Siedlungszentren des Leitbildes CK-73. Studienunterlage Nr. 26, ORL-Institut ETH Zürich 1976
- Pendlerströme 1970 (Tägliche Arbeitspendler) 1:300'000
  Tami Piero und Leibundgut Hans: Die Pendlerbeziehungen in der Schweiz. Studienunterlage Nr. 37, ORL-Institut ETH Zürich 1978

The map "Pendlerströme 1970" (commuter flows) is a revision of the map "Tagespendler" (daily commuters) which is based on the results of the 1960 census (National Atlas of Switzerland, map 33).

In cooperation with the "National Atlas of Switzerland" maps about internal migration have been designed, they will be published in connection with the revision of the National Atlas of Switzerland and they show in a scale of 1:300'000 the net migration and the volume of migration for each community. They also show migration flows between Cantons. The maps are referring to the time-period of 1965-70 and are based on the results of a research project about internal migration in Switzerland:


(Prof.Dr.H.Elsasser, Dr.H.Trachsler)
Since 1974 there is worked in connexion with a physio-geographical investigation program at different geomorphological, geological, hydrological and climatological themes. Therefore some representative landscapes of the region of Basle are investigated in a large scale. Following the geographical approach of the landscape research, also a cartographic representation of the research is aimed at. Between 1974 and 1979 a number of thematic maps in large scale were made, originating from the fields geoecology, climatic geography, soil-geography, geomorphology and hydrological geography.

The main working fields are several types of landscapes (see figure, areas 1, a, c, and d). Maps in the scales between 1:5'000 and 1:12'500 exist for these regions. Usually there is a series of analytic maps from which a synthetic one was derived. For example: a map of pedotops and physiotops was derived from different single geoecological themes. Also, several maps of the ground-climate and the microclimate have been made and were summarized in synthetic climatic maps. Partly, maps of the risk for frost damages were developed from the analytic maps.

In addition to the work on these three landscape-types there has been worked systematically since 1975 on the basis of map-sheet 1067 Arlesheim 1:25'000 of the topographic maps of Switzerland. The following themes were and are treated: Geomorphological conditions of the relief, soil- and substratum types, ground- and microclimate, geoecological units, land-using manners. The mappings take place on the scale of 1:10'000 and should be generalized to 1:25'000. 2/3 of the map-sheet are mapped. The last third is in preparation.

All these maps have the purpose to present systematically the physio-geographical conditions of the region in a large scale, because till today there aren't documents, neither in a large scale nor with comparable themes. At the same time the maps shall be a base for application in regional planning, because there is a connexion to the actual land-use. It is planned to develop such applied maps. To this subject a series of maps in the scale of 1:25'000 has already been presented, which shows problems of recreational activities in the nearer environment of Basle.

Another centre of activity is the participation in the production of the "Geomorphological Map of West Germany 1:25'000" (GMK 25). For this mapping program the sheets Wehr (TK 25 8313) and Mössingen (TK 25 7520) are already mapped. The sheet Wehr is being printed. The aim of mapping is the consolidation of the geomorphological methods of mapping in a large scale with the possibilities to interpret the maps for practical uses. In addition, the sheet Freiburg-South (TK 100 C 8310) is prepared for the "Geomorphological map of West Germany 1:100'000" (GMK 100).

(Prof. Dr. H. Leser)
Areas of the Physio-Geographical Mapping 1:5'000 to 1:25'000 in the Region of Basle

1. Test landscapes for geoeological investigations: a = "Bruderholz" (type of the borderlands); b = "Seewener See" (type of the Jura-Plateau); 
c = "Möhliner Feld" (type of the lower and upper terrace landscape);
d = "Rothenfluh and Amwil" (type of the Jura-border and the border of the Jura-Border). 2. Test landscapes for geomorphological investigations. 3. Sheet "Wehr" of the geomorphological map of West Germany 1:25'000.
4. Areas of the investigations during the practical field courses between 1975 and 1979. 5. Numbers of the sheets of the topographic maps of Switzerland 1:25'000.

LESER, H.: Das GMK-Projekt. Bericht über die Arbeiten an geomorphologischen Karten der BRD. In: Kartographische Nachrichten, 26 (1976), S. 169-177
Cartography as it is taught and practiced in our department is geared entirely to the needs of geography. For us it is a means of expression, a tool of research and a way of looking at the world. The lectures and the lab in cartography are organized as a part of the basic training for anyone who studies geography. The following lecture courses in cartography are offered:

**Cartography I**, as an introduction course for the beginners in geography and non-majors;

**Cartography II**, as a general introduction to the thematic cartography for the majors who have to design and work with cartographic media in research and in school.

Along with these lecture courses the geography majors work in the Cartography Lab to get acquainted with practical aspects of designing thematic maps and to learn to critically appraise maps as teaching instrument.

A special lecture course in Historical Cartography is occasionally given by a visiting specialist in this field.

It should be noted that the related field of Remote Sensing and Air Photo Interpretation is well covered by respective lecture and lab courses. This field is also actively engaged in the production of maps. Particular mention must be made of a series of population maps of the Yemen Arab Republic published by the department within the last few years in conjunction with the Yemen Air Photo Project.

Although cartography often constitutes a very important part of a masters or doctoral thesis as a tool to the problem-solving in geography, it is rarely a topic of research in itself, whether from a theoretical or technical point of view. For example, a masters thesis currently in progress analyses the development of thematic mapping in the nineteenth-century Switzerland as an expression of spatial concepts. A most recently completed doctoral thesis*) which makes ample use of techniques in historical cartography is essentially a research in historical and political geography.

Computer-Assisted Cartography is practiced in the same sense - as a tool of spatial analysis. Currently we are successfully cooperating with the Cantonal Government of Aargau to produce statistical maps with printer partly within the framework of the aforementioned Cartography Lab.

(Dr. Haruko Kishimoto)

*) R. Lüchinger: Fürstabtisch-st. gallische Marchenbeschreibungsbücher und Grenzkarten als Quellen geographischer Forschung: eine historisch-kartographische Untersuchung der "Alten Landschaft" entlang der st. gallisch/thurgauischen Grenze
Département de géographie de l'Université de Genève
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La cartographie est enseignée dans le cadre de la licence en géographie depuis le début des années 1970. Elle se compose de trois degrés, dont chacun comporte un cours-séminaire de deux heures hebdomadaires. Le contenu est le suivant:

Première année: Connaissance de la carte topographique: projections, triangulation, nivellement, procédés photogrammétriques. Techniques de prise de photos aériennes. Utilisation conjointe de la carte et de la photo aérienne dans la recherche thématique.

Deuxième année: Sémiologie du croquis thématique: saisie des données statistiques et redressement de populations géographiques. Théorie de la communication graphique; analyse des variations visuelles et systématique de la représentation. Typologie graphique.

Troisième année: L'analyse de données par croquis: représentation graphique des données d'analyses multivariées. Synthèse régionale par croquis thématique.

L'accent est placé, dans l'enseignement, sur la production de croquis de recherche, effectuée manuellement, à l'aide de données statistiques enregistrées sur un support d'ordinateur.

La cartographie automatique est utilisée depuis 1975 (système Cartom, programme créé à Genève et Lausanne), comme auxiliaire d'enseignement. Un certain développement doit intervenir prochainement avec l'acquisition de programmes étrangers de traitement cartographique.

Effectif: un dessinateur cartographe à mi-temps.

Les moyens de recherche et de publication cartographique sont donc actuellement assez limités.

(Dr. Ch. Hussy)

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Various cartographic activities are going on also in this University Department, but unfortunately no report was received.