Positioning Names on Maps

Eduard Imhof

ABSTRACT. Prof. Dr. Eduard Imhof, dean of European cartographers, has been an astute student of the esthetic-scientific characteristics of the cartographic method. In this paper published 13 years ago, he draws upon his long experience in map design and production to formulate a series of precepts about positioning or locating the lettering on maps in relation to the various functional aspects of the map and the individual named features. Noting that legibility and clarity of the map depend on good name positioning—each name having only one optimum position on the map—he encourages the use of a graphic draft of lettering to determine this position.

A map sheet normally contains several hundred to several thousand names. Map lettering, therefore, has great linguistic, practical, technical, and esthetic importance and we can examine the subject of map lettering from vastly different points of view. Important and often very difficult grammatical-linguistic and linguistic-geographic problems arise, as do questions about the principles of name adoption, the number and selection of names. Furthermore, problems, such as those of graphic structure, type style, type size, type appearance, type color, association of type with object (i.e., the establishment of a type style for each class of objects), type arrangement or type position, and, finally, the actual placing of the type also arise. There is considerable literature about some of these things. Today work concerning the international regulation of name spelling has special priority; Manlio Castiglioni gives valuable directions about this in his paper "Toponymy and Cartography."[1]

Techniques of type manufacture have great economic significance. Quite recently these techniques have undergone revolutionary changes and, therefore, have received a great deal of attention in the cartographic literature. Paul Buhler has presented the important innovations in his comprehensive essay, "Type Styles and Lettering with Special Regard to the Swiss Topographic Map Series."[2]

Here we will occupy ourselves with the positioning of names on the map.

Good name position aids map reading considerably and enhances the esthetics of the map. The expression "clothes make the man" applied to cartography would be "good form and placing of type make the good map." Poor, sloppy, amateurish type placement is irresponsible; it spoils even the best image and impedes reading.

For 150 years, distinct rules concerning type placement spread among topographers and cartographers by word of mouth. The master taught his journeyman and the latter inculcated them in his apprentice. It was extremely rare that any rules were written down or recorded in the literature; further, these rarities were limited to a few suggestions. Exceptions include *Lettering on Topographic Maps*[3] and an essay by Wilhelm Bonacker, "Name Positioning on Geographic Maps."[4]

One practice of name positioning is becoming of particular importance today; though the modern, mechanized processes of type arrangement and placement are, to be sure, quite systematic, they nevertheless conceal the germ of the complete disintegration of good graphic usage. Machines and devices are extremely useful and desirable, insofar as they expedite and reduce the cost of map preparation, but they are of very questionable value if their use does not also preserve the quality of the maps. Moreover, I think that the technicians working at the typesetting machines would perform their daily task with more enjoyment and responsibility if they knew that type placement is of special importance and that this placement should result from an ordering of the contents and from graphic-esthetic principles. The professional and ethical standards of work that the type engraver used to have have been lost through mechanization; they could be reestablished if the user of stickup lettering were to have a greater knowledge and understanding of the principles and effects of placement.

Placing names on maps interests not only topographers, cartographers, and map technicians, but also geographers. Is there a geographer who has no use for cartography?

In this essay, I will present some brief instructions concerning the placement of map lettering. For the sake of clarity and utility, I will give these instructions in the form of key word rules and I will illustrate them, using figures in which "good" and "poor" examples are contrasted.

I initially laid down these rules and examples in 1957 for the first international university course in cartography at the Eidgenössischen Technischen Hochschule in Zürich. There is—and I emphasize this —*no rule without exception.* Often one principle cannot be reconciled with another. Often two rules stand in opposition; every case must be considered individually and then the principle to be used chosen. Just for illustration, type sizes of our figures are about one-and-a-half to two times larger than is customary on maps.*

A. GENERAL PRINCIPLES AND REQUIREMENTS

"Map lettering stands not on a uniform white ground, like the print of books, but in graphic competition and opposition with [other elements of] map design. Lettering and design are equally important and necessary; therefore a compromise must be found. Furthermore, perhaps the type cannot be aligned as in a book, although it should be whenever possible."[5]

Here are some general principles and requirements:

1. The names should, in spite of their incorporation into the dense graphics of the map, be easily read, easily discriminated, and easily and quickly located. *Legibility* depends not only on type form, type size, and type color but also on the position or arrangement of other names. It also depends on other map contents, but I do not wish to concern ourselves with this problem here.

2. The name and the object to which it belongs should be easily recognized. *Clear graphic association* often determines style, size, size-gradation, and quantity of type, as well as map content. Narrow-running types are generally used on small-scale maps, where contents are more crowded than on large-scale maps.

3. Names should disturb other map contents as little as possible. Avoid covering, overlapping, and concealment.

4. Names should assist directly in revealing spatial situation, territorial extent, connections, importance, and differentiation of objects.

5. Type arrangement should reflect the classification and hierarchy of objects on the map; variation of style and size help do this.

6. Names should not be evenly dispersed over the map, nor should names be densely

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* In this instance and where specific measurements are given, reference is made to the original publication in *International Yearbook of Cartography,* 2 (1962).

clustered. Here name selection and name arrangement are important.

The above principles and following directions generate clarity and legibility.

B. THE THREE TYPES OF DESIGNATIONS

Names, or designations, can be divided into three categories:

1. *Position designations,* or names for point-like objects and concepts. In the following they are also called *punctiform designations.*

2. *Linear designations,* i.e., names for objects and concepts with linear or ribbon-like extent.

3. *Areal or surface designations.*

Placing a name in one of these categories depends, in part, on the scale of the map.

Position designations are used not only for points in the geometric sense, such as triangulation points, but also for small objects, whose surface extents on the map are so small that names cannot be placed within them. Examples: Figs. 1–4.

Linear designations are used for lines or ribbon-like objects and concepts. The placement of the name is adapted to the linear or ribbon-like form.

Areal designations are used for areas on the map in which names can be set. The extent and position of the place names should indicate, as much as possible, the form and the extent of the mapped area.

On large-scale maps, names can often be set within a building; however, this is not desirable if a type line is forced to incline and mar the attractiveness of the map. It is, therefore, sometimes better to treat certain areas as "points," i.e., one should place their names horizontally next to the building. Sometimes at small scales island and island group names also have point designations (Fig. 5), as do specific mountain peaks; mountain ranges, or formations of large extent, do not have point designations. Examples: *Bachistock* (a single peak) in contrast to *Glarnisch Mas-*

sif (Fig. 7), or *Rigi-Kulm* in contrast to *Rigi* (Fig. 8). Whether a mountain name is interpreted as a position or areal designation depends a great deal on scale. *Rigi* at large-scale is an areal designation for a mountain group. At small-scale, however, it becomes a position designation (Figs. 8 and 9). The situation is similar for islands, island groups, and lakes (Figs. 10 and 11).

Names of ribbon-like form, such as rivers, streams, and some lakes, are normally set up as linear; at larger scales, however, they are often set up as areal designations (Figs. 12–15).
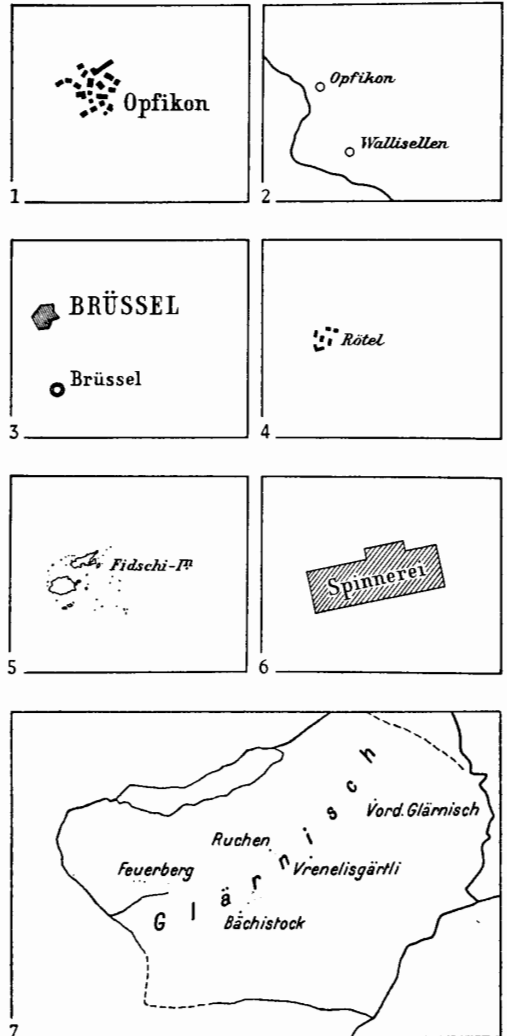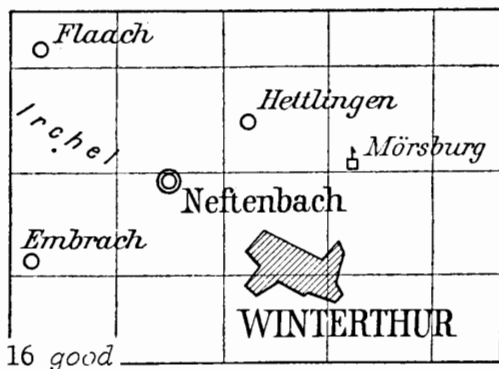

Figs. 1–7.
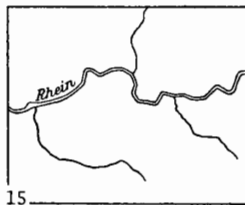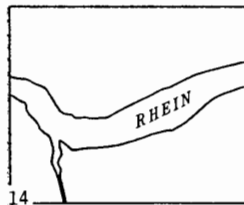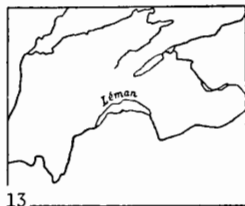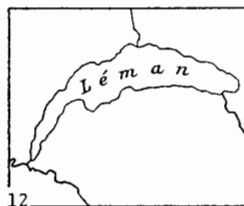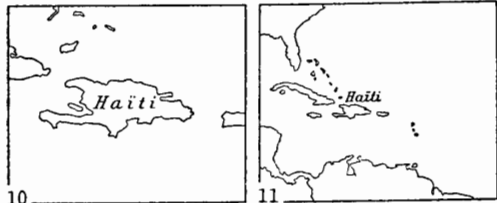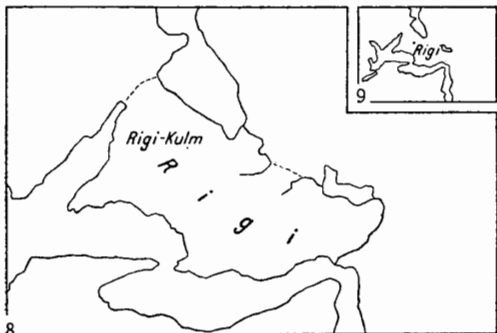
Figs. 8–15.

## C. POSITION OR PUNCTIFORM DESIGNATIONS

General

Punctiform designations should be labels next to, over, or under the object. Position names without breaks; do not spread them out. Without exception, on large-scale maps they should be horizontal to the rectangular coordinates and on small-scale maps parallel to the parallels of latitude. Note that the names should not be set on a grid line (Figs. 16 and 17). Figure 18 illustrates what should not be: obliquely placed and curved names.

Is a name best placed to the right or left of its object, above it or below it? Krummil and Eckert say: "Where space allows, it is best to have the name beginning to the right of the symbol or sign."[6] However, any placement is permissible and some are even unavoidable; though all are not equally good.
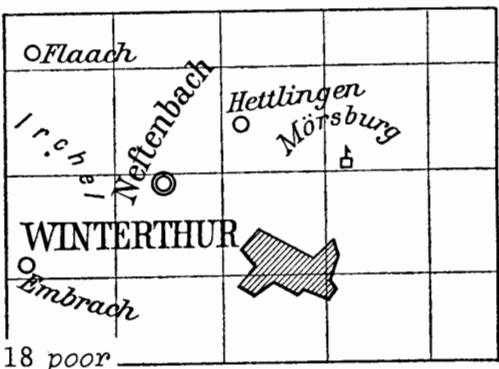
When a symbol lies in an empty field the

16 good
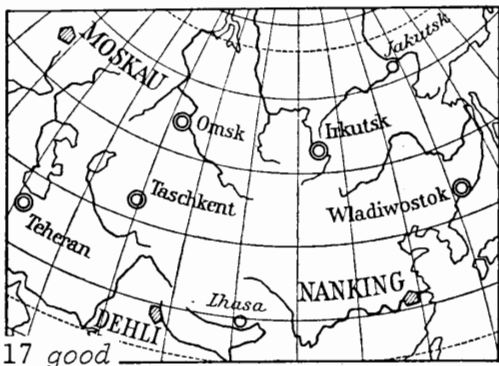
17 good

18 poor

Figs. 16–18.

best place for its point designation is to the right and somewhat above that symbol (Figs. 19 and 22). If both object and name lie on the same line there is an unfavorable optical coincidence (Figs. 20 and 21) and legibility decreases. Nevertheless, the position in Fig. 20 is preferred to that of Fig. 21. A name to the left of its object (Fig. 21) is always undesirable, not only for the sake of legibility but also for the sake of execution.

If free space is available only over or under the object, then a "title" (Fig. 24) is preferable to a "signature" (Fig. 23) for the following reason: Ascending and descending letters push the type line away from its object; since in the Latin alphabet small letters with ascenders are much more numerous than those with descenders, "titles" in general will push away less than "signatures."

There is another question: How near to or far from the object should the name be? This depends on the general graphic character of the map, on its scale, and, within this scale, on the sizes of the object and of the type (Figs. 1–4). In Fig. 1 the name-

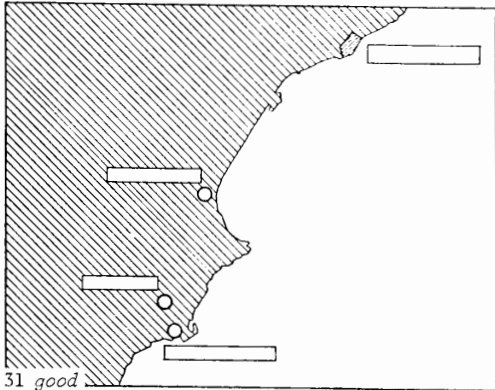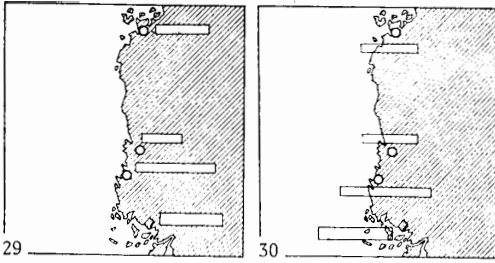25 *good* 26 *poor*

27 *good* 28 *poor*
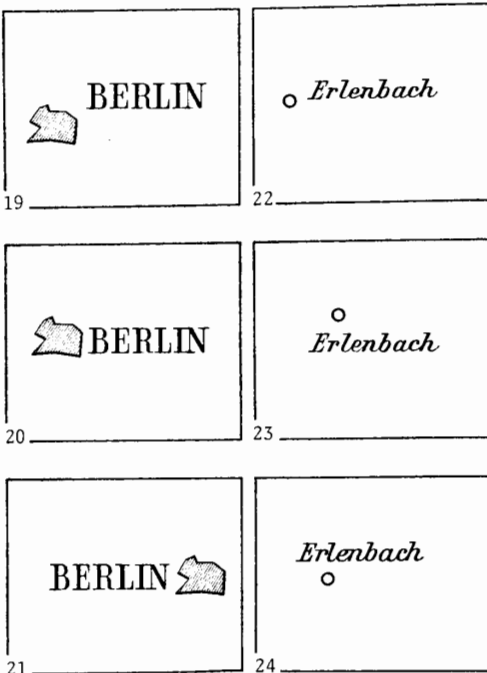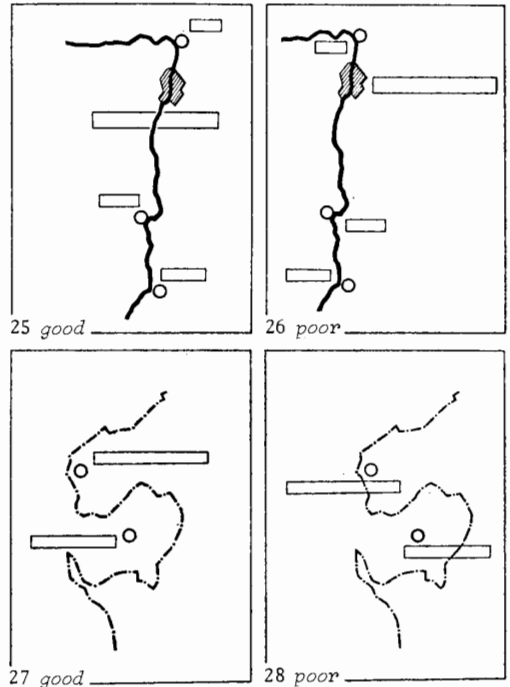
Figs. 25–28.

object distance amounts to about 2.3 mm. whereas at a smaller scale (Fig. 2), it amounts to 1.3 mm. In Fig. 3 the symbol and the type in the upper example are larger than in the lower example, consequently the distance between symbol and type should also be greater. Always consider such graphic-optical relationships.

Names for Places on Linear Features

Location becomes quite clear through skillful placing of the name. For points to the left of a river or a boundary line, place the whole name to the left of that line. For points to the right, place names to the right (Figs. 25 and 27). For places on both sides of a river (e.g., *Budapest*) split the name to span the river, or place it in available space to the right. Figures 25 and 27 are good; Figs. 26 and 28 are poor solutions.

Names for Places on Ocean Coasts and Lake Shores

For esthetic reasons, names should be placed wholly on the land (Fig. 29), not on the ocean or lake surface, and not half

19 BERLIN

22 o *Erlenbach*

20 BERLIN

23 o *Erlenbach*

21 BERLIN

24 *Erlenbach* o

Figs. 19–24.

Figs. 29–31.

on water and half on land (Fig. 30). Here the esthetic requirement differs with the legibility requirement; hence, the following rule is important: Names of shore and coastal places should be written completely on the water surface. Names of places near the shore, but not lying on the shore, should be written completely on the land surface. The example is in Fig. 31, the counterexample—a poor solution—is in Fig. 32.

On small-scale maps which usually have a dense series of places and names, place all names of coastal places on the ocean. Moreover, set the names slightly outwards, curved away from the horizontal (Fig. 33).

Names on Small-Scale Maps

As already mentioned one should choose narrowly-spaced letters for small-scale maps so that places and names are more clearly associated.

City and Other Place Names

Often a place name should appear in two different languages or spellings. For example, a name in its native language and in an internationally accepted form:

EL QUAHIRA or *CAIRO* [El Quahira]

The alternate or second name is best printed in a lighter type than the first. Above all, the second name should be exactly symmetrical under the first or else in brackets closely following the first. Any other position could be misleading.

Summit Names

Names for single mountain tops come under the rule for position designations. It is sometimes customary to write the name of the mountain in circular arc form around the summit point (Fig. 34). This is not recommended because the type face is unsteady and not very legible; often the name pushes away too much from the elevation. A free choice of name position— to the left, right, over or under—is impossible. A curved type line forces one to use smaller type, for with larger type and long names the curve becomes too long and it would arc too much around the peak, or
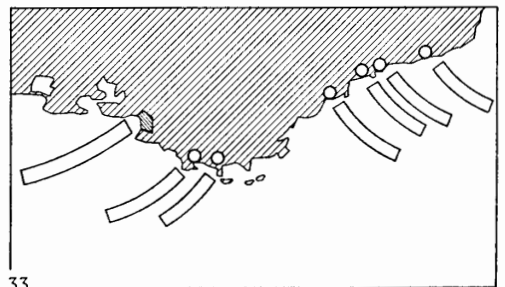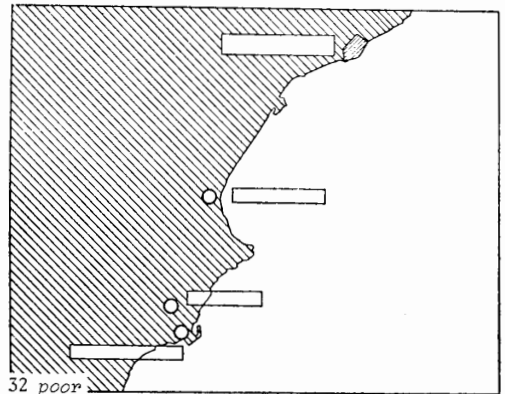

Figs. 32 and 33.

it would have to be drawn with such a large radius that it would have to be far away from the peak. A curved line cannot be asymmetrical; thus it is difficult and time-consuming to execute. Strongly curved labels defy typographic custom: letters are pulled apart unevenly and unpleasantly; names are hard to read. The solution illustrated in Fig. 35 is preferable.

Mountain Pass Names

Should mountain passes have punctiform or linear designations? Passes are both point-like and linear; their names are used for heights, for divides, for trails and roads. Which sense predominates is largely a question of scale, of personal judgment of local usage. Important passes with roads, especially level crossings, are generally understood by the public at large and treated by mapmakers as linear features. The name of the highest point in a pass without a path is generally considered a punctiform designation (e.g., the Swiss gateway, *Fellilücke,* in Fig. 36). Moreover, the name position in Fig. 36 is used on large-scale maps. At smaller scales and for the more important passes, linear positioning should be used (Fig. 37). The position of the pass should be marked by a contour.

The name positions shown in Figs. 38 and 39 are poor. When the actual route through a pass is not shown, placing the pass name along the direction of the route is useful. The name indicates, as it were, the line. Figure 40 is good, Fig. 41 is poor. The horizontal positioning of a pass name may cause, inappropriately, the name to be separated into two words. Example: *Gotthard-pass* instead of *Gotthardpass.* Such word splitting to make way around the symbol and the contour is sometimes done on maps; it is, however, a questionable spelling practice, especially in German.
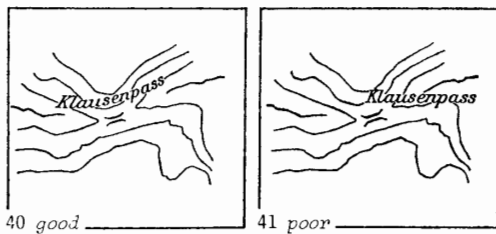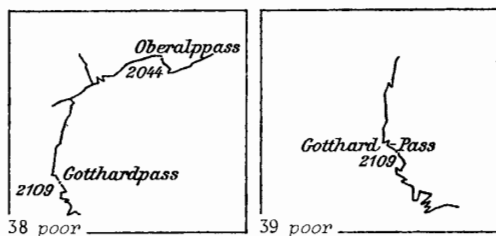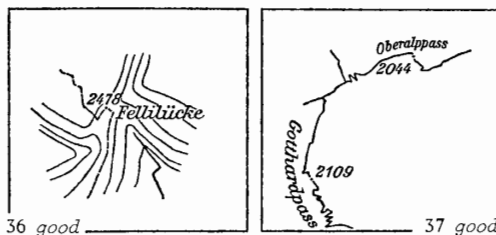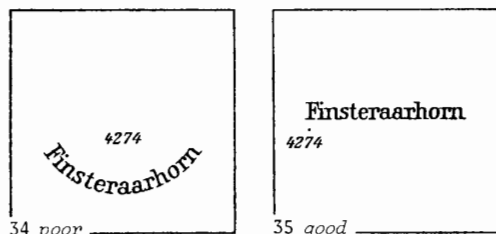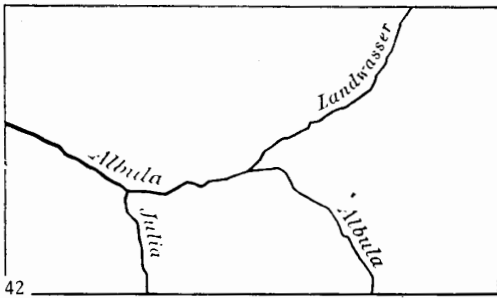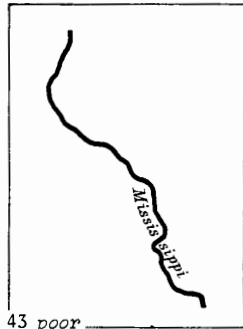
D. LINEAR DESIGNATIONS

Such designations refer to streams, rivers, paths, streets, railroads, ship courses, air lines, and cables; to the tropics, the polar circles, and so forth; and, as shown above, to pass routes. Furthermore, in thematic mapping they refer to communication lines, boundary lines, military lines, and migration paths. On maps, by far the most frequent linear designations are for streams and rivers.
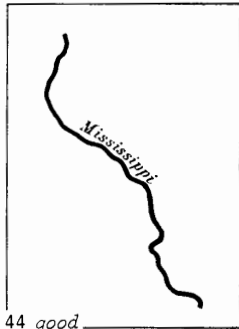
For linear designations do the following: Place names along the lines to which they refer. The linear direction of the type should conform to the curvature of the line, e.g., to the watercourse; however, complicated and extreme type curvatures should be avoided (Fig. 50). If possible, put names in unoccupied map areas so that they can be easily located and easily read. Horizontal, or almost horizontal, type
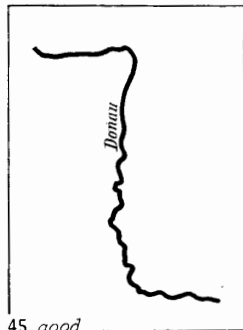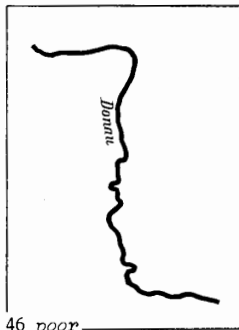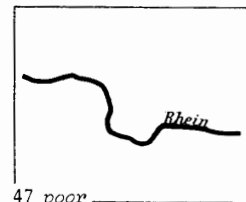

Figs. 34–41.

Figs. 42–46.

lines are preferable. The type series should be cohesive or, better, very slightly spaced (Fig. 59 is good, Fig. 60, poor). Repeat designations at suitable intervals. This applies, above all, to river names above and below the mouths of large tributaries, since river names often change at river junctions (Fig. 42). While type lines should not cling to their objects (Fig. 47), they should not be too far from them (Fig. 48), nor should the names cross their objects (Fig. 43). Put river names in sections where the river bends least, where it does not run vertically up and down the map sheet, and where there are

the fewest objects (Figs. 44 and 49). If the river line runs vertically, write the name with the first letter towards the bottom of the map (Fig. 45). Another direction, as Fig. 46 illustrates, is only to be substituted if the object is completely over on the right side of the map. With regard to this see the rules for areal types.

River names cannot follow stream direction in all instances because they would end up upside down. The distance between names and lines depends on type size and on the visual strength of the lines (Figs. 47 and 48 are poor, Fig. 49 is good). Write names over lines (Fig. 49), not under them (Fig. 52); names adjust to lines better from above, since they usually have fewer descenders than ascenders.
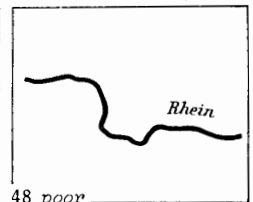
Always place names right next to the object lines and not, as in Fig. 51, on the other side of an intervening symbol (e.g., a street line).
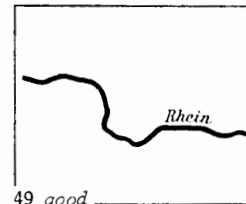
E. AREAL DESIGNATIONS

Areal designations refer to areas of every type: woods, fields, mountain massifs, mountain ridges, mountain ranges,
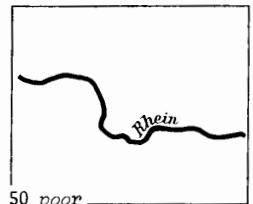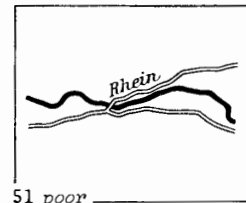

Figs. 47–52.

New York - Hamburg
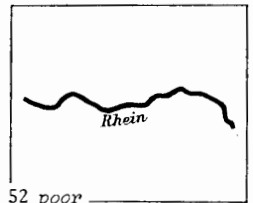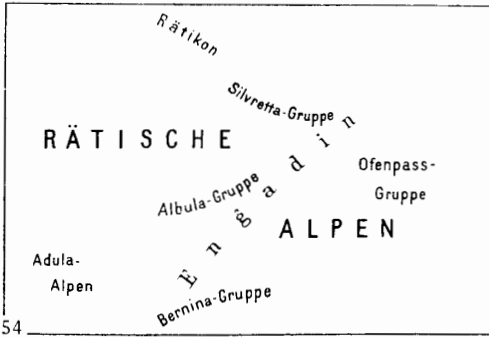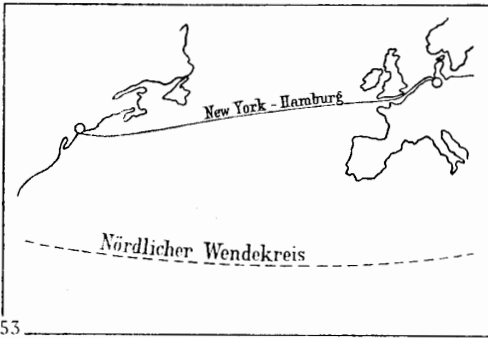
Nördlicher Wendekreis

53

Rätikon

Silvretta-Gruppe

RÄTISCHE

Ofenpass-

Albula-Gruppe

Gruppe

ALPEN

Adula-
Alpen

Bernina-Gruppe

54

Figs. 53 and 54.

moors, glaciers, lakes, oceans, sections of oceans, islands, island groups, peninsulas, countries, sections of countries, states, regions of all kinds. The map surfaces must be large enough, however, so that the designations can be easily set into the area. This is the prerequisite for areal type arrangement. Sometimes the areas are defined plainly and sharply, as is the rule with seas, islands, fields, glaciers, and political areas. Sometimes they are not, as, for example, with mountain massifs, landscapes, sections of oceans, geographical regions, and spheres of influence. When making a map, one of the first things to do is decide on the length and height of the areal designation; in the draft the length can be indicated by a line which will be omitted on the final product.

In many cases areas overlap; those of higher order overlap areas of lesser order. For an example, see Fig. 54.

In general, the following should be applied to areal designations (see, in addition, Figs. 55 and 56).

Clear areal association often requires

bending and spreading a name so that it is stretched as much as possible across the horizontal axis of the area. Expand a name towards the boundaries of its area; leave a space at least one-and-one-half the size of the letters on either end of the word. Sometimes it is best to divide long names into two or three horizontal lines (Figs. 54, 56, and 57); each division should be a whole word. There should be absolutely no syllabification on a map. Hyphens, type style, and type placement make the connection of divided words (*Ofenpass-Gruppe*) obvious. Words in every line begin with capital letters. Tilted names, those that deviate from the horizontal, should never be set on straight lines, they should always be slightly curved.

If possible, bend curved type lines somewhat towards the horizontal. Make this bending simple; make the radius of curvature of the line constant for each word. As a rule, confine yourself to a single arc of a circle, which, when possible, is no greater than about 60 degrees. Doubly curved lines are for long names only; they


55 *good*

56 *poor*
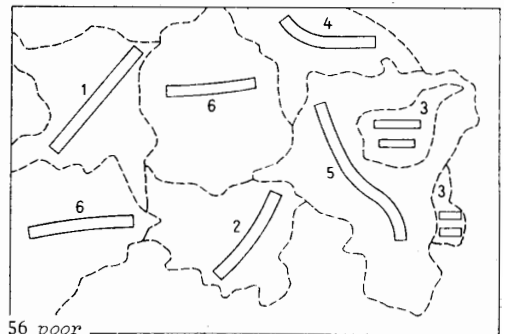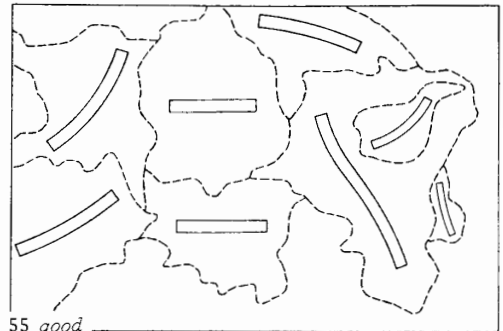
Figs. 55 and 56.

can have a very elegant effect. Uneven and sharp curves are not fit for good maps. On the other hand, if bent and crooked, then distinctly bent and crooked! A type line should be either exactly horizontal or deviate noticeably away from the horizontal, either really straight or clearly curved. Maps allow no indecision or obscurity.

Figure 55 demonstrates a good, Fig. 56 a poor, arrangement. The mistakes of Fig. 56 are:

Name 1. The type line is straight, instead of slightly curved. In addition, it is too close to the border.

Name 2. Unnecessarily, the type is set obliquely; horizontal placement would be very easy.
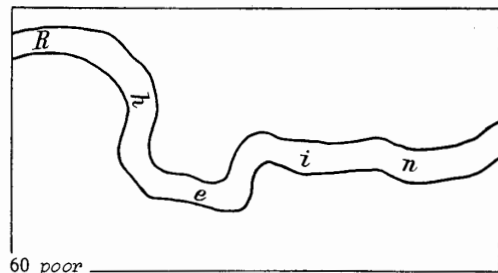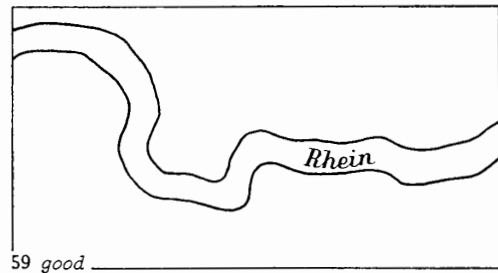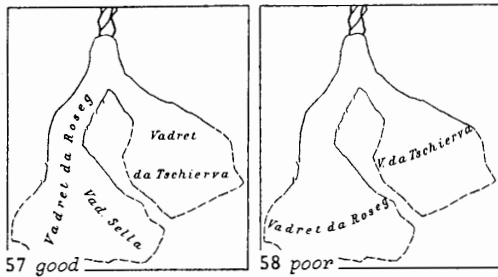

Figs. 57–60.
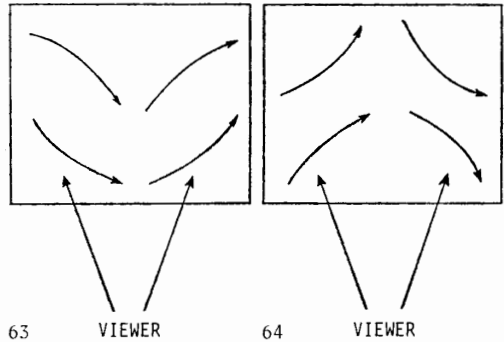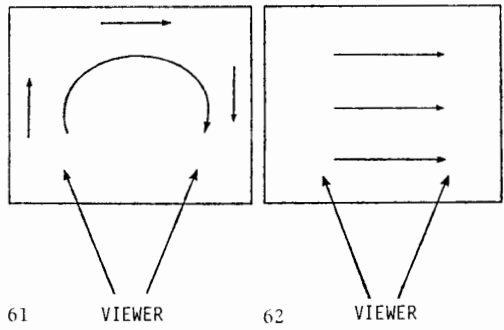
Figs. 61–64.

Name 3. The name is unnecessarily divided.

Name 4. The name is unevenly curved and on one side is written too close to the border.

Name 5. The name is poorly positioned.

Name 6. There is some question as to whether the name was intended to be horizontal or slanting.

Axial lines and fluid forms are especially important for large river bands, for glacier tongues, for elongated lakes, for flowing objects of every type. Figures 57 and 58 show the arrangement of glacier names. Figure 57 is good, Fig. 58 is poor. Large river names are, as already mentioned, sometimes linear and sometimes areal. They should never be spaced out as are areal names (Fig. 59). Do not . adapt them to the length of the ribbon-like areas (Fig. 60), making them illegible. Do not spread out the letters; repeat the names at ' suitable intervals. When possible, choose a place where the name can be set close to the horizontal and not where it must be bent more than slightly (Fig. 59).
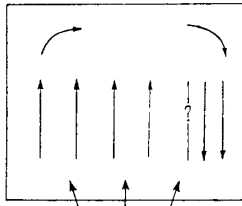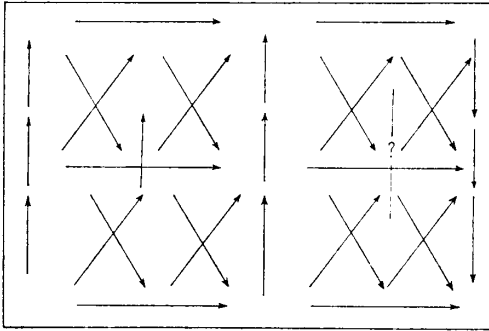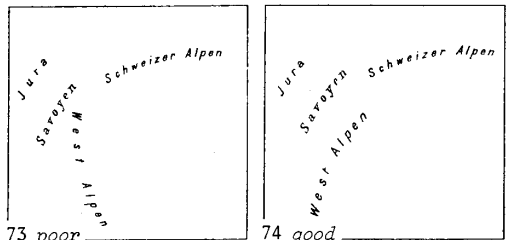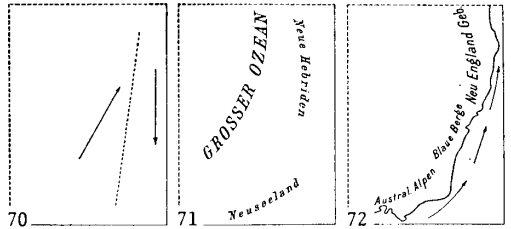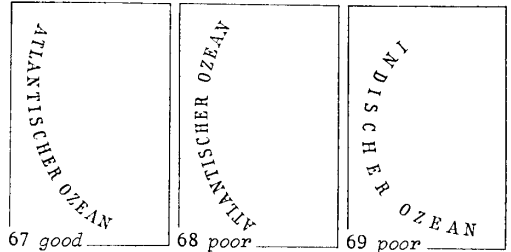
65   VIEWER

66

VIEWER

Figs. 65 and 66.

Direction of the Lettering

On a map the type should stand as upright as possible in the interest of better legibility. Above all, the type should not be inverted. Words should follow the ordinary writing direction from left to right, the so-called "clockwise direction" or "writing sense" (Fig. 61). Sloping names should always be written from left below to right above or from left above to right below, not upside down with respect to the reader (Figs. 63 and 64). For vertical type lines this means that on the left half of the map the writing direction will always be from below to above (as on European style book bindings); on the right half of the map the writing direction will be from above to below (Fig. 61); in the middle, as in Figs. 65 and 66, lie ambiguous cases.
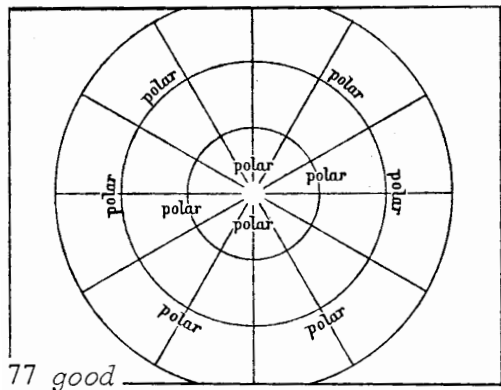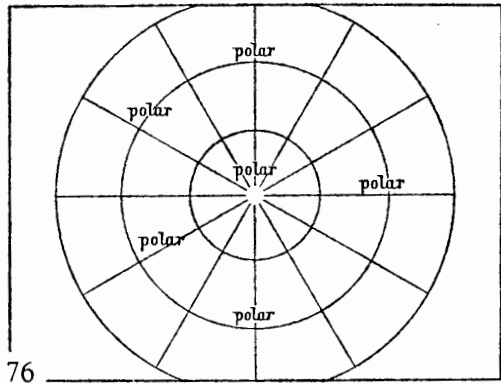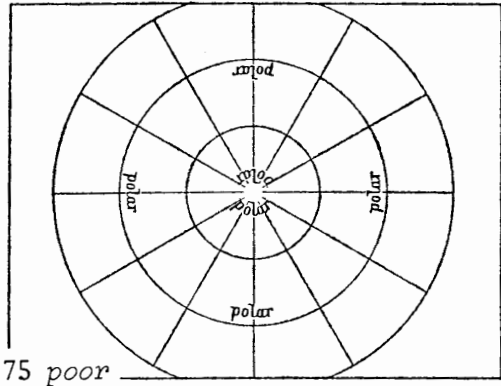
Figure 66 demonstrates the above rules. In addition an important rule is that

adjacent area names run in the same direction.

Borderline and questionable cases exist not only as in Figs. 65 and 66 but also with curved lines which have a vertical trend. Here, on account of bending, two principles often stand opposed: running from left to right and keeping letters right side up (upright positioning) (Figs. 67, 68, and 69), or running from left to right and running adjacent names in the same direction (parallelism-synchronization) (Figs. 70 and 71). Which rule is more important? For the most part, it is advisable to settle in favor of running adjacent names in the same direction, as in Fig. 72. The solution in Fig. 71 is not good. However, borderline cases, as in Figs. 68 and 69, should be and usually can be avoided by placing the names somewhat differently in the area. Figures 73 and 74

67 *good*

68 *poor*

69 *poor*

70

71

72

73 *poor*

74 *good*

Figs. 67–74.

75 poor

76

77 good

Figs. 75–77.

Slight changes on the map surface often resolve conflicts.

The Exceptional Case of Polar Maps

Figures 75–77 demonstrate three different solutions (Figs. 75 and 76 are taken from Zöppritz and Bludau[7]). The solution shown in Fig. 75 is completely untenable and the solution in Fig. 76 is not very good. The solution of Fig. 77 is best; names near the center (less than two or three cm. away) are placed horizontally; other names are parallel to the parallels of latitude and nowhere upside down.

Type Spacing

According to Zöppritz and Bludau,[7] the spacing width x should be at the most twice as large as the type height y (Fig. 78). This rule may serve in many cases as fundamental, yet often it cannot be observed. More fundamental is this: The type series should always be easily grasped visually and be easily seen and read con-

78

79

80 good

81 poor

82 poor

83 good

84 poor

85 good

Figs. 78–85.

are examples. The word West Alpen in Fig. 73 corresponds to the rule of upright positioning; it contradicts, however, the rule of parallelism-synchronization. In Fig. 74, the line was turned somewhat within the accompanying area; the name was written from below to above and it was made parallel to the other names.
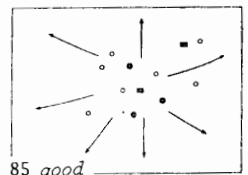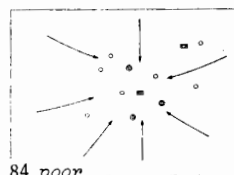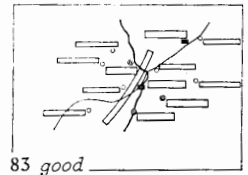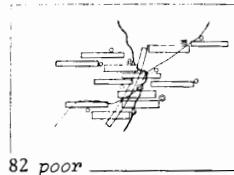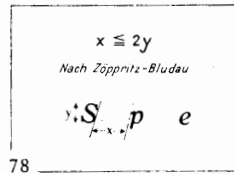
tinuously. How extensive the spacing is sometimes depends very much on the contents or the degree to which the map is filled. The connection is often very easily grasped in open spaces, but elsewhere not, even though the same type and spacing is used. Very extended names should always refer to very large superimposed areas; they are important names. With large spacing, correspondingly large type is required. The often too strong effect of large type can be mitigated by means of open face type, such as Fig. 79 demonstrates. The spacing has to be equidistant (Fig. 80). Playing accordion with map type doesn't sound good (Fig. 81)! "Equal spacing" means optical or visual equal spacing. Visual appearance also depends on the type forms and on the remaining map content.

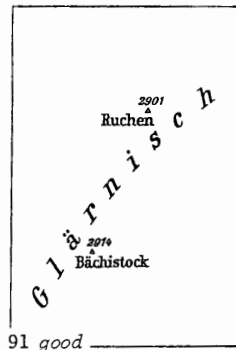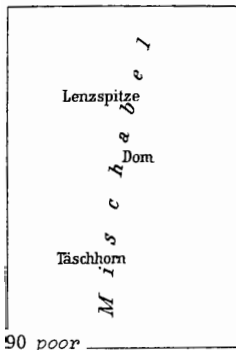## F. COMBINATIONS AND TOTAL IMPRESSION OF THE LETTERING

Accumulations of Type

Seldom is the density of names on a map sheet equal throughout; depending on the content and purpose of the map, areas with a high density of important objects do occur. In such cases, how does one avoid unpleasant clustering of the lettering and, as a result, uncertainty of object associations? One works on the lettering draft from the center of density outwards: Begin at the center and shift as many names as possible outwards without disregarding the requirements for clear object associations (Figs. 82–85).
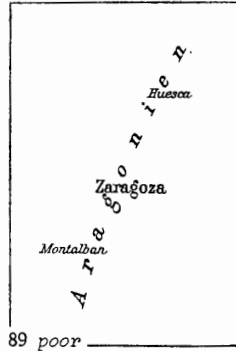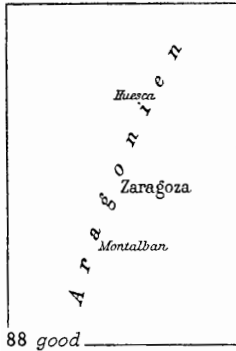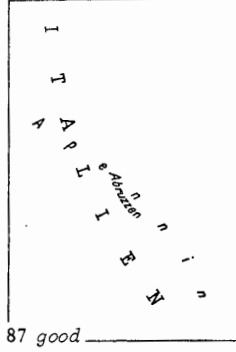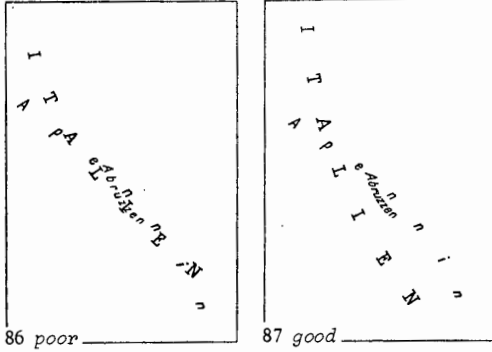
Overlapping Lettering

Avoid too much overlapping. The solution in Fig. 87 is better than that in Fig. 86.

Above all avoid overlapping types which are nearly the same height and have nearly the same thickness. Intersections of names should be placed, if possible, at the boundary between units of compound words. If names in small type stand across a larger written name, then push them as much as possible away from the larger name. The solution in Fig. 88 is better than that of Fig. 89. A general rule of thumb is: On the lettering draft, first place the large names extending over large areas and then the small names. If, at first, the type design is not good, then shift the large name somewhat. Spread it out more or bring the letters closer together. Bend it more or straighten it out. Place it more obliquely or less obliquely, and then test the combination again. Often it's a good idea to design a large name on a strip of tracing

Figs. 86–91.

86 poor   87 good   88 good   89 poor   90 poor   91 good

92 poor

93 poor

94 good

Figs. 92–94.

Figures 92, 93, 95, 97, 99, and 100 illustrate poor placements; Figs. 94, 96, 98, and 101 are better. In Fig. 97, the name *Freiburg* cuts the name *Schwarzwald* into two parts; this disturbance is avoided in Fig. 98 by spreading *Schwarzwald* and shifting *Freiburg*. The right angle crossing of names in Fig. 99 is not good; the much too trailing intersection and the splitting of *Spessart* into two parts is not good either. In Fig. 101, these errors are avoided.

Summary Observations

Type accumulations, type overlapping, and type spreading require great care. W. Schule makes the following excellent remarks: "Above all, the undesirable impression of chaos, of the crowded anthill, of the dancing type, must be held off. Thus, no trailing intersections, no widely spaced letters which make the eye miss connections, no multiple bends in curves. Above all, no threefold intersections; these are nonsensical complicators!"[5]

95 poor

96 good

97 poor

98 good

Figs. 95–98.

paper first and then move the strip around to find a good ensemble.

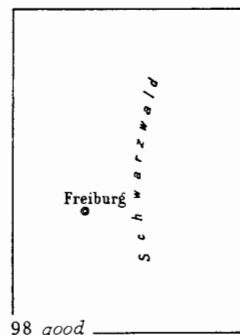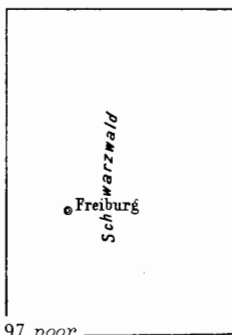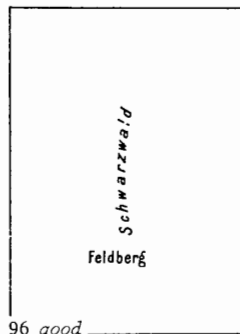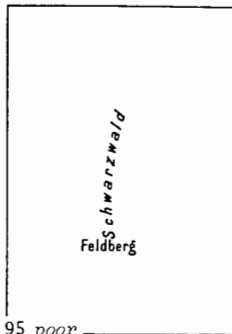Type crossings at right angles are not good (Fig. 90 is poor, Fig. 91, good).

If a name and an elevation both refer to the same object, then place the name far enough away so that the elevation can be near the point.

Type figures formed through visual connection of two or more different names should be avoided as much as possible.
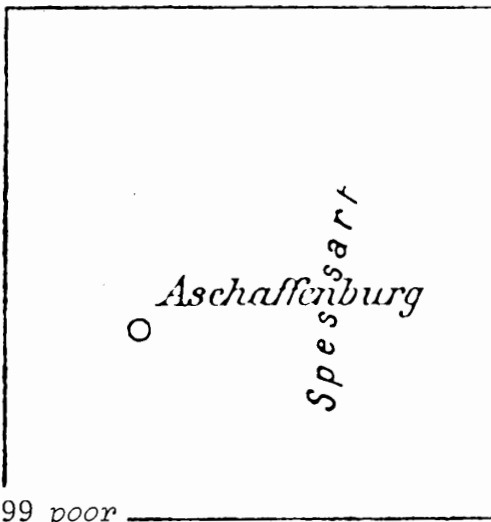
99 *poor* 100 *poor* 101 *good*

Figs. 99–101.

G. COMBINING TYPE WITH OTHER MAP CONTENTS

Consider the following rules:

1. Whenever possible avoid overlapping and covering names with other symbols. Move the names a little bit; sometimes names in otherwise empty spaces are good design elements.

2. Interrupt lines, hachures, and so forth when they go through names and dots. The eye connects such little interruptions automatically. Figures 102 and 104 give examples of what to do. In Figs. 103 and 105, the lines or shades are continued beneath the type, making for confusion and illegibility. Interruptions of graphic elements are necessary and allowable, however, only if symbols and lettering are the same color, not if a symbol is printed in an essentially weaker tone than the lettering.

3. On plastic shaded relief maps, if possible, set the larger and strongly written names on shaded mountain slopes, and then they will not dim the light surface that is so important for a plastic impression. For legibility, finely written names are preferable on the light side.
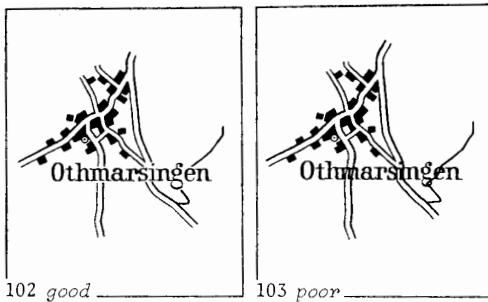
102 *good*   103 *poor*
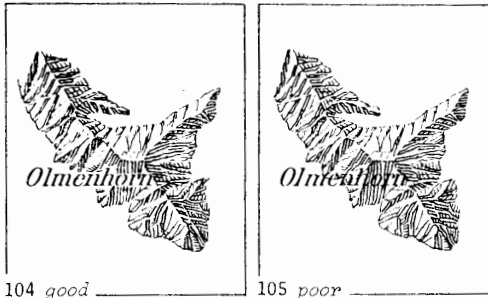
104 *good*   105 *poor*

$$Z \quad \ddot{u} \quad r \quad i \,|\, \textit{chsee}$$

$$\textit{Züri} \,|\, c \quad h \quad s \quad e \quad e$$

106

Figs. 102–106.

H. CHARACTERISTICS OF MAP MARGINS

Government map compilations, such as the topographic sheets of most states, with many names on the sheet borders have special solutions. Two adjacent sheets can be put together and many names span the common margin; this is achieved by placing the letters of the word as if the two sheets were joined. Moreover, part of the word falling on an adjacent sheet is written in the empty margin band, and because of limited margin space, the letters are usually closely spaced and in condensed type (Fig. 106).

Often, whole names of important objects near the margin are repeated in the margins of the connecting sheet. Sheets of the *Landeskarte der Schweiz* 1:100,000,[8] contain excellent examples.

In bound map compilations, in **atlases** in book form, and in books where maps on single pages reach very close to deep-lying center folds, the names and parts of names are often hardly legible. To prevent this keep a small strip of a few millimeters free of letters alongside the inner margin of the map; this method was applied, along with others, by Dr. W. Bormann in the new *Bertelsmann-Atlanten*.[9]

I. LETTERING DRAFTS

Outstanding and dependable maps are rarely produced without a careful lettering draft having been made first. In a first draft, names are selected, linguistic and grammatical forms are chosen, their coverage is decided upon, and the names are arranged according to importance. The first draft is an editorial, linguistic, and general geographic affair. Design forms are often exactly regulated for national plans and map work. The Swiss Land Register Survey is an example: Before the final arrangement of 1:5,000 or 1:10,000 scale maps a so-called name tracing must be made, with a name list and linear demarcation of the extent of every name.

Here I am concerned not so much with the editorial aspects of the lettering design, as with the graphic aspects of the type placement. In most cases, it is advisable to make up a hand-drawn lettering draft and accompanying name register before positioning the type. Type style, type size, and, above all, positioning and extent of each word should be laid out exactly on the hand-drawn design. A blueprint or a copy of linear map features are suitable bases for the lettering draft. Often the type design is traced out on a transparent sheet. It is senseless and uneconomical to draw the design in a form ready for reproduction; a carefully drawn outline in pencil or ink is enough. In most cases there is a best possible position for each name. Such positions should be determined and portrayed in the lettering draft. Besides, from this draft one can get an opinion about the total effect of the map. A lettering draft, in association with its name register, facilitates the actual type

positioning extraordinarily. It guards against mistakes, incorrect placement, and disagreeable patchworks or repetitions. It also makes second editorial checks possible.

In most cases the editorial and graphic aspects of the design will merge in a single draft. For such melding matters an overall method can hardly be postulated. Making an accurate lettering draft and name inventory before producing the map is worthwhile: it improves the quality of the map and reduces reproduction costs.

Elevation Points

Lettering drafts also include points of elevation, bathymetric depths, and values along contours. Choice ordering of these numbers is no less important than a good arrangement of letters. It would be appropriate here to dwell on contours, but let me reserve this badly neglected section of cartography for a future publication.

I bring to a close my remarks, and in forthcoming issues of the *Yearbook* I hope to discuss other aspects of map lettering.

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