

ŠTÚDIE

FRANS SNACKEN

**INTEGRATED LANDSCAPE RESEARCH, SOME FUNDAMENTAL VALUES
AND THEIR APPLICATION**

Frans Snacken: Integrated Landscape Research, Some Fundamental Values and Their Application. Geogr. Čas., 29, 1977, 3; 10 maps, 3 figs, 5 refs.

To find out whether landscape is something „material“ or nothing else but an image is a superfluous discussion: landscape is both, material and image. Its material substance, in its three-dimensional disposition has been studied and mapped by geographers since a long time. This is a landscape-mapping based on content. But the real new challenge is the identification and mapping of landscape-physiognomy. We have tried a method aiming at the elaboration of two maps, a first map, looking downward to the landscape along a vertical axis, which allows us to characterize horizontal forms. A second map is then elaborated and based on ground-level observation in a horizontal direction, allowing the identification and classification of profile and of vertical features in general.

Finally some ideas are expressed on how one can proceed to landscape-evaluation in view of its application to landscape-planning.

I think we can readily admit that "landscape" is a holistic concept. Knowing that such a concept cannot be handled as a whole, the geographer involved in landscape research, will try to grasp and to express what seems to him *essential* about.

In fact, we are facing the following choice: 1° We try to proceed in a true scientific way, regardless application-possibilities; this approach requires the elaboration of a theoretical model first, to be compared later, with the existing reality.

2° In another way, we may, in a more traditional style, shift to a limited *intentional* synthesis, the intention being expressed by the way one wants an existing landscape to be handled or managed.

We have given preference to the second approach because we think in terms

of application, of a possible contribution to a long-range landscape-management policy.

In Flanders we are in the situation where man is over-using his own space, and where, at the same time, he is neglecting both the forces of nature and the historical values of civilisation.

So, it is urgent to try to improve the environment in terms of quality. Landscape-evaluation, based on landscape-mapping is a means to it, and in the present condition, we tend to be maximalistic about.

So, when evaluating landscape, we quote highly the landscape that is:

- natural or semi-natural,
- showing persistence of representative anthropogenic features and structures, including relicts of cultural value.

It is clear that rural as well as urban landscapes will be considered.

Among the people dealing with landscape, two important categories emerge distinctly:

To the *first category* belong those who use the land for direct economic profit: we think mainly of people active in farming, forest-exploitation, brick-making, estate-building, etc.

These people, commonly, have little interest in the scenic qualities of the land they exploit; they may get interested in landscape-scenery as soon as they visit *other* landscapes, f. i. as tourists.

To the *second category* belong mainly, urban people, whether living in town or outside makes no difference: they do not use the land for economic profit and those, who are not indifferent, will show interest for the landscape's scenic qualities. Their profit is purely emotional and psychological.

Since more than one hundred years, geographers have studied and mapped landscape on the basis of its CONTENT. As the landscape-physiognomy or image is dependent upon the landscape-content, it is important to go on with landscape-mapping on the basis of content.

MAPPING LANDSCAPE-CONTENT

Our most recent experience of landscape-mapping on the basis of content has been in an area east of Antwerp, dominantly rural but with already a strong impact of modern industrial and urban influence. It includes the small town of Herentals.

Because of the high degree of urbanization of some rural areas it was impossible to draw accurate limits separating the rural from the urban landscape. This brought us to make a classification, and consequently, a legend, that would be applicable to both cases.

How we proceeded can be followed on fig. 1 showing the elaboration of 11 single-value maps (on a scale 1:10 000) made by a combined use of existing maps, air-photographs and systematic field-work. Maps Nr. 1 and 2 give data on morphology, soils, surface waters and semi-natural vegetation, the other

ones refer to land-use, size and form of fieldplots, living enclosures, roads etc., with special attention paid to habitat, mentioning function, morphology, age and architectural characteristics of buildings. On map Nr. 11 we have located the buildings and monuments of exceptional historical or cultural value.

The next step is one of synthesis, including the introduction of the dynamic aspect of landscape-transformation. Therefore the maps are compared with

C O N T E N T

Single value maps (+) (1 : 10 000)

Physical

Anthropogenic



Introduction of dynamical aspects comparison with historical maps (Ferraris 1777)

basic maps

(1 : 25 000)



Physical



persistence
of older cultural
landscape



impact of
modernization

Evaluation map
classes 3—2—1—0

scale 1 : 25 000
for rural areas



scale 1 : 10 000
for urban areas

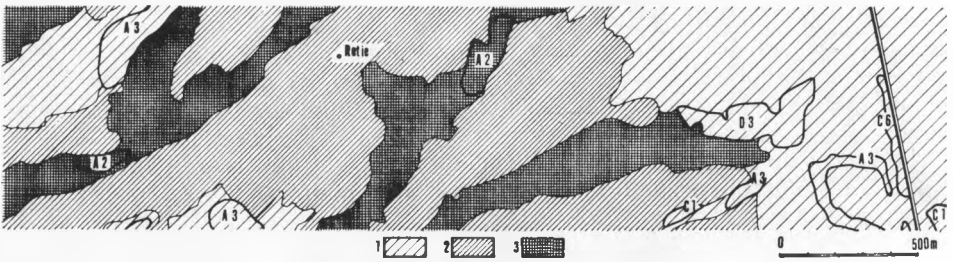
(+) Physical

1. morphology, soils
2. vegetation, natural, semi-natural

Anthropogenic

- | | |
|--|--|
| <ol style="list-style-type: none"> 3. agricultural land-use 4. non agricultural land-use 5. fieldplots 6. living enclosures and solitary trees 7. roads, canals | <ol style="list-style-type: none"> 8. buildings, function 9. buildings, morphology 10. buildings, age and architecture 11. objects and monuments of historical value |
|--|--|

Fig. 1



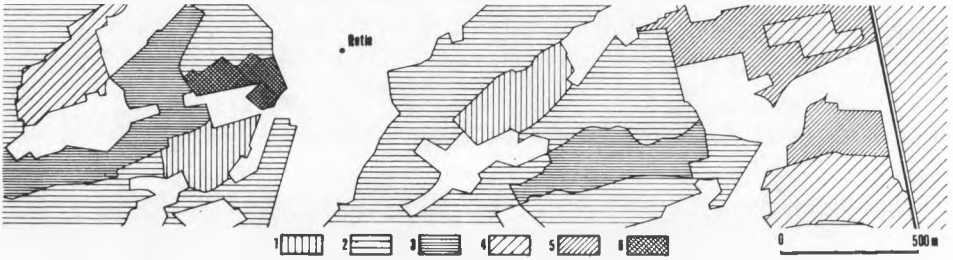
Map 1. Physical geographical data

1 — Sandy soils with a thin humiferous A-horizon and extreme drainage conditions, 2 — Sandy soils with a thick humiferous A-horizon and intermediate drainage condition, 3 — Sandy soils, with clay and a thick humiferous A-horizon; intermediate drainage conditions.

limits of
other units

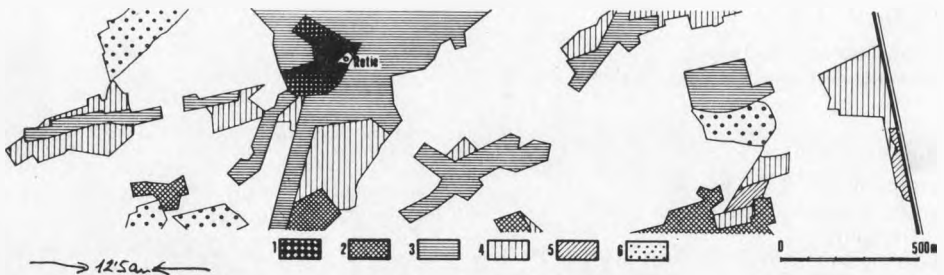
A2: river valley,
A3: dunes,
D3: small artificial-lake,

C1: heathland, dry,
C6: woodland, moist.



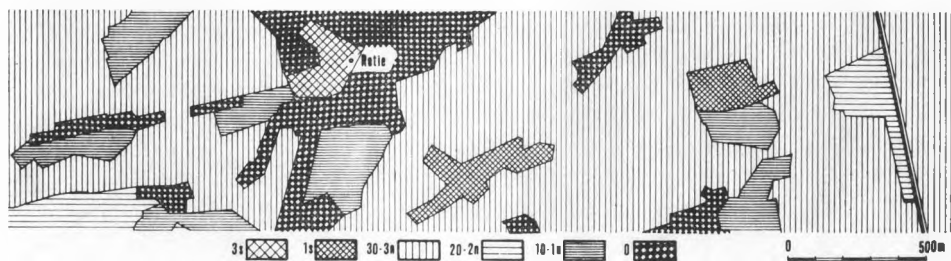
Map 2. Old cultural landscape

1 — Old cropland, open landscape, 2 — Complex of cropland and grass, small mazes, irregular pattern of blocky and elongated fieldplots; linear enclosures, 3 — Dominantly grassland, elongated fieldplots, commercial plantation of poplar, 4 — Coniferous woodland, previously heathland, 5 — Complex of cropland and grass, large mazes, regular pattern; linear enclosures, 6 — Castle with park.



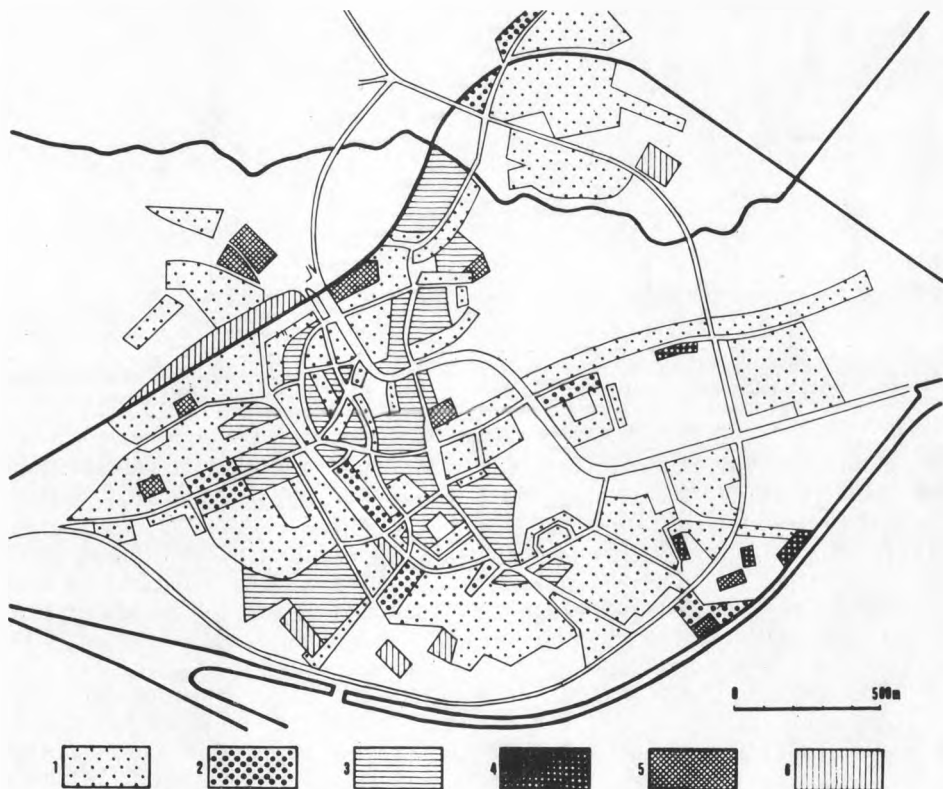
Map 3. Impact of modernization

1 — Cohesive habitat, patchy, 2 — Habitat as small nuclei and/or clusters, 3 — Habitat, linear, 4 — Agricultural land, 5 — Recent woodland [planted], 6 — Areas of recreation.



Map 4. Evaluation

3s Habitat: evaluated as very high, 1s Habitat: low, 30—3n Old or new: very high, 20—2n Old or new: high, 10—1n Old or new: Low, 0 Undifferentiated: very low.



Map 5. Built up area according to function

1 — Habitat, residential, 2 — Habitat, commercial activities and services, 3 — Commerce, services, 4 — Agriculture, 5 — Industry, 6 — Others.



Map 6. Built up area according to age

1 — Before WI (world-war I), 2 — Between W I and W II, 3 — After WII, 4 — Complex.

the historical map of Ferraris (1777) and special attention is paid to those areas that still reflect the traditional agricultural pattern and have escaped the disharmonic impact of modernization.

This step of synthetization is graphically represented by three maps (scale 1:25 000) called "basic maps", the first one summarizing the physical features, the second one devoted to the spatial persistence of the older cultural landscape and the third map showing the impact of modernization. Evidently the maps 2 and 3 are complementary to one another.

Within the area considered, we have chosen the rural vicinity of the village of Retie as an example as far as the three basic maps is concerned (nr. 1, 2, 3). A similar procedure has been applied to the small town of Herentals (18 000 inhabitants). Here we have reproduced the most conspicuous maps on habitat and monuments (Nr. 5—10), including (on map Nr. 4) the morphology of anthropogenic vegetation.

In this case synthesis leads to the sectorial-map (Nr. 9, being the basis for evaluation-map Nr. 10).

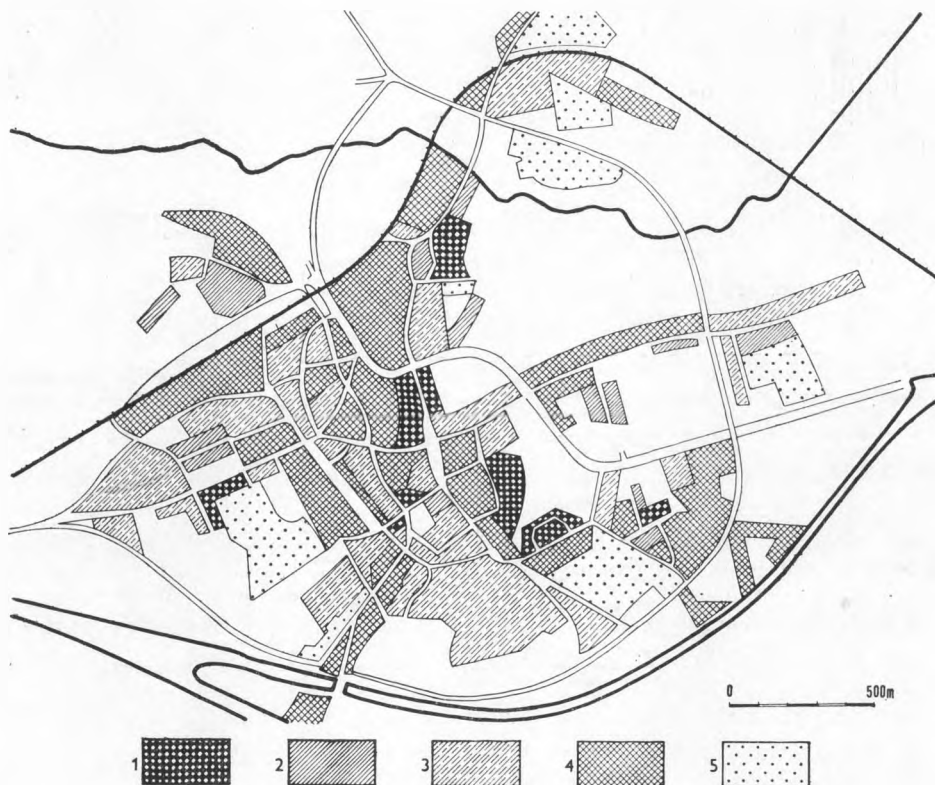
The elaboration of the *evaluation map* (Nr. 4, 10) is the result of team-work, with discussion of a priority-scale of the criteria used, and of their application to the basic maps.

Aware of the significance but also of the limitations relative to landscape-mapping on the basis of content, we felt the need to analyse and appreciate landscape-physiognomy as well.

MAPPING LANDSCAPE-PHYSIOGNOMY

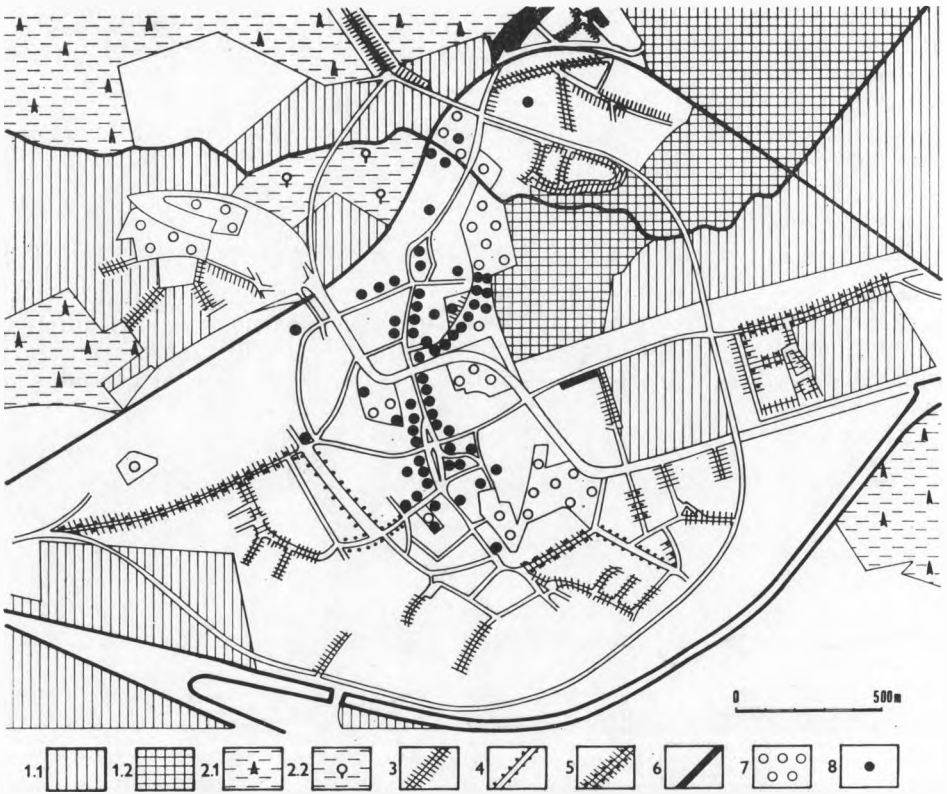
Landscape-scenery will produce, to the observing eye, an "image" which cannot be split up. There is a total image or there is no image at all. It is easily fluctuating. It changes with time, with the location of the observer, with the direction of the observation-axis, even with the mental condition of the observer.

A single spot on earth can be viewed in so many ways as to produce an



Map 7. Built up area according to morphology

- 1 — Homogeneous, 2 — Homogeneous, slightly damaged, 3 — Heterogeneous, with homogeneous parts, 4 — Heterogeneous, 5 — Uniform.



Map 8. Morphology of green elements, historical objects

1.1 — Agricultural land, open landscape, 1.2 — Agricultural land, closed landscape, 2.1 — Woodland, coniferous, 2.2 — Poplars, 3 — Small front-garden [low], 4 — Alleys, 5 — Alleys and garden [low], 6 — Gardens with full-grown trees, 7 — Park, 8 — Historical objects [buildings, monuments, etc.].

infinite number of images. In order to be able to handle them, a systematization is necessary.

We have tried a few systems used in the Netherlands [4, 1] but we found out they are not satisfactory for the type of landscape we were dealing with.

So, we decided to try a method by our own, which is now being tested in some areas of Flanders.

First we have introduced three preliminary simplifications:

1. The observer is conscious as an observer,
2. The observation-time is day-time in summer,
3. While making the observation, the observer will not move to another place.

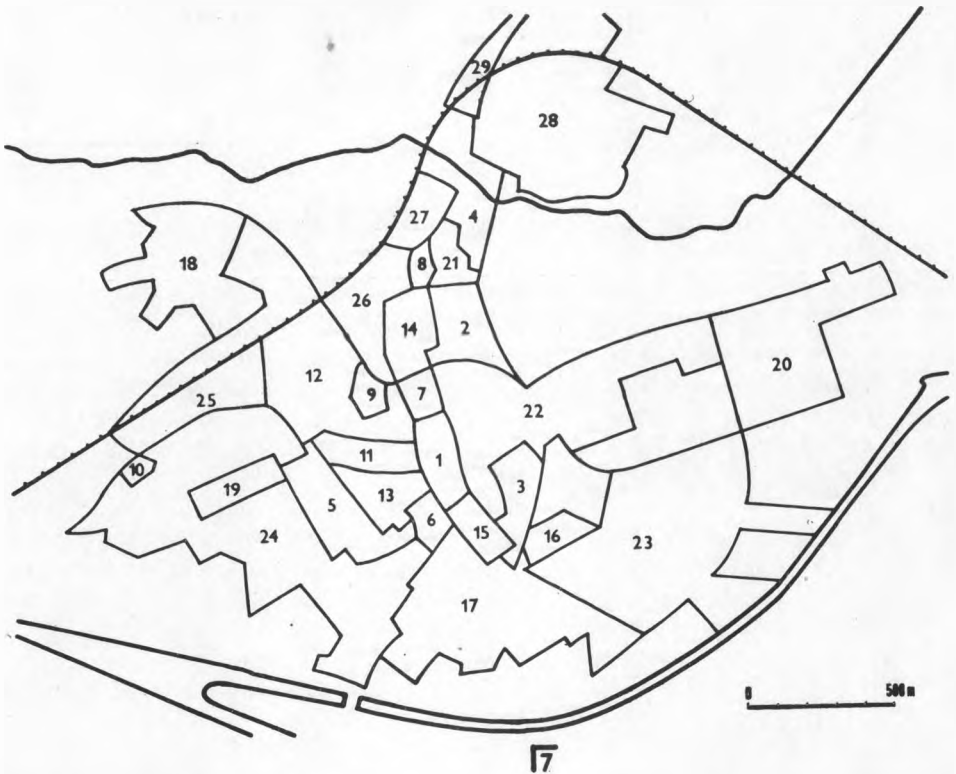
Then we have made a choice among the infinite possible observation-points and directions.

1. There is a first observation-point, located along a *vertical axis*, and the observer looking downward, seeing an image similar to the one produced on a vertical air-photograph. For convenience the surface considered is a square of 1 km².

2. The second observation-point is located on man-height above ground-level, the observer looking along a *horizontal axis*, rotating over 360°. While rotating the images considered are those coinciding with the cardinal points: N.E.S.W. When sufficient similarity is present in all directions, only one will have to be noticed. Then, preference is given to a northern orientation, solely for the reason to be as systematic as possible.

The image produced by *vertical observation* is most suitable for the visualization of *pattern*.

As pattern is the result of spatial relationship of geometric figures (projected on a flat surface), these figures can be observed as "area", as "line" or as a "point" ("dot" in our jargon).



Map 9. Sections (relatively homogeneous)



Map 10. Evaluation

1 — Very high, 2 — High, 3 — Low, 4 — Very Low.

The criteria we have selected for classification, are:

- AREAS: maze-size and maze-form,
- LINES: continuity versus discontinuity, completed in terms of deviation from straightness,
- DOTS: classified according to their spatial distribution (dispersed, cluster, linear, solitary, etc.), after having said whether they can move or not.

The legend, as it is used now, is reproduced on fig. 2, left side.

The image produced when observation occurs along a *horizontal axis*, is most suitable for the visualization of *profile*.

The selected criteria are:

- APPEARANCE (in dutch: "opbouw"), being the optical result of the main

- features caught by the observer's eye, between skyline and ground level,
- THE SCREEN-EFFECT, refers to features having a linear disposition and producing an obstacle to visibility. This may act in a massive way (so-called "coulisse") or allow filtering transparency. This characteristic affects the degree by which a landscape is "open" or "closed".
 - SKYLINE, is the line separating the sky from the earth-bound features, as seen by the observer.

As the landscape is always observed in its three dimensions, one can consider the image as composed by a finite number of successive "planes". In most cases (even when considering panoramic scenery in a hilly landscape) the number of planes can be kept between 1 and 5.

But this is too many for practical cartography: it would mean at least 15 symbols to characterize the image (because of the three criteria mentioned). With reticence we have lowered the number of planes to a "foreground" and a "background", which still needs at least 6 symbols to characterize the image, seen along a horizontal axis. However this number seems convenient because the image, seen along a vertical axis, is also expressed by six symbols.

With these criteria a legend is built and submitted to field-cartography. The results are provisional and, as the experiment is going on, the legend is adapted consequently (Fig. 2, right side).

As long as we remain in the field of "image characterization" it is evident that a "fusion" of images observed along a horizontal axis with an image observed along a vertical axis is impossible.

However, each one of them can be expressed by a code, applied on the considered grid-square. This will bring us to the construction of two grid-maps.

With a well-chosen cartographic legend these grid-maps will give a visual expression of pattern and profile. This makes sense, especially if the scale has been kept the same as that on of the *content-maps*.

A LANDSCAPE CHARACTERIZING MAP-SET

The present procedure has allowed us to map extensive information on 11 single-value maps and on 2 grid-maps. Through synthetic grouping it is possible to come down from these 13 maps to 5 maps, *three* referring to *content*, *two* referring to *image*.

As far as content is concerned we have already shown how we proceed from the three basic maps to a *single* evaluation map.

For the *evaluation of the image-data* we proceed in a similar way: we first build the codified grid, notifying for each square the symbols related to pattern (based on vertical observation) and the symbols related to profile (based on horizontal observation). As shown on fig. 3, we can transform the upper-figures (related to pattern) into a grid-map that will help the visualization of the main features observed along a vertical axis, and into a similar grid-map for the horizontally observed features.

One can decide that there is no need to go further than this step: both image-maps can be compared between themselves, and each one can be compared with the content evaluation map.

But if the nature of the study requires some quantitative expression of the image-quality, this can be done. The team involved in the mapping-process will elaborate a scale of criteria, and apply them to the image-maps. If drawn on tracing-paper, with mention of the evaluation by a simple figure (3, 2, 1 and 0) this grid can be surimposed on the content-evaluation map, and one can detect possible parallelism or contrast. Even through an adequate printing-process, it is possible to have both maps printed as one.

Its legend can be kept very simple, so as to be read and used by anyone who is able to read a map.

I M A G E

Vertical observation axis

0. Absent or not conspicuous

maze-size

1. Dominance of large maze
2. Medium maze
3. Small maze
4. Mixed in size

maze-form

1. Regular blocky
2. Regular elongated
3. Irregular
4. Mixed forms

L I N E S

0. Absent or not conspicuous

continuity

5. Continuous
6. Discontinuous
7. Both, 5 + 6

form

1. Straight
2. Curved or meandering
3. Dented
4. Irregular
5. Mixed forms

D O T S

0. Absent or not conspicuous

stability

8. Not movable
9. Movable

pattern

1. Cluster
2. Linear
3. Dispersed
4. Solitary
5. Mixed

Fig. 2

For real understanding of what lies behind the evaluation-data, one should consult the other maps.

It is evident that a map-set of this sort, is not necessarily a final stage. It is a document out of which other maps (f.i. maps on potentialities) can be derivated, and which, as the landscape is changing through time, will need follow-up and permanent completion.

Although landscape-mapping can be applied to all parts of the world, it does not seem to have sense to try a detailed classification like this one, on a world-scale. It may be, anyhow, a meaningful attempt to see how far one can go.

SUMMARY

To find out whether landscape is something „material” or nothing else but an image, seems to me a superfluous discussion: landscape is both, material and image. Its material substance, in its three-dimensional disposition has been studied and mapped by geographers since a long time. This is landscape-mapping based on content. In this cintribution we will discuss some of its problems. Attention is also paid to landscape-dynamics.

But the real new challenge is the identification and mapping of landscape-physiognomy.

Horizontal observation axis

APPEARANCE {foreground features}

- | | |
|---------------------------------------|------------------------------------|
| 10. Even, no other elements | 15. Patches, angular forms, linear |
| 11. Even, some other elements | 16. Complex of 12+13 |
| 12. Patches, rounded forms non-linear | 17. Complex of 14+15 |
| 13. Patches, angular forms non-linear | 18. Domin. points, dispersed |
| 14. Patches, rounded forms linear | 19. Domin. points, linear |

SCREEN

- | | |
|---------------------------------|--|
| 20. Open, completely | 25. Transparant, with massive elements |
| 21. Open, with points | 26. Closed, with open spaces |
| 22. Open, with lines | 27. Closed, without open spaces |
| 23. Open, with patches | 28. Closed, with short distance transparency |
| 24. With filtering transparency | 29. Fully closed |

SKYLINE

- | | |
|-----------------------------------|--|
| 80. No skyline | 85. Complex of 83+84 |
| 81. Groundlevel horizontal | 86. 82+upward protrusion |
| 82. Above ground level horizontal | 87. 83+upward protrusion |
| 83. Above g. l. sinuous | 88. 84+upward protrusion |
| 84. Above, g. l. angular | 89. 85+upward protrusion |
| Example: | 22. 51. 83 : vertical observation axis |
| | 14. 27. 85 : horizontal observation axis |

SINGLE VALUE MAPS

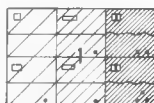
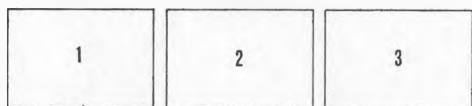
11 51 00	22 51 00	34 52 03
11 22 02	14 26 03	14 26 03
11 51 04	22 51 04	34 52 01
11 22 02	11 22 02	14 26 05

GRID, CODIFIED TABLE



BASIC MAPS

GRID MAPS

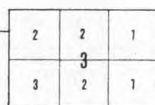
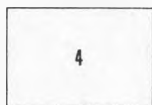


VERTICAL OBSERVATION AXIS

HORIZONTAL OBSERVATION AXIS

EVALUATION MAP

EVALUATION



DM TRACING PAPER

Fig. 3

As an experimental attempt, we have tried a method aiming at the elaboration of two maps, a first map, looking downward to the landscape along a vertical axis, which allows us to characterize horizontal forms, especially their pattern. A second map is then elaborated and based on ground-level observation in a horizontal direction, allowing the identification and classification of profile and of vertical features in general.

Finally some ideas are expressed on how one can proceed to landscape-evaluation in view of its application to landscape-planning.

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Frans Snacken

INTEGROVANÝ VÝSKUM KRAJINY, NIEKTORÉ ZÁKLADNÉ VÝZNAMY
A JEHO POUŽITIE

Zisťovať, či krajina je niečo „materiálne“ alebo nič iné ako obraz, pokladáme za zbytočnú diskusiu; krajina je obidvoje, je materiálnou a je aj obrazom. Materiálnu sub-

stanciu krajiny v jej trojdimenzionálnych rozmeroch študujú a mapujú geografi už dlhý čas. Toto mapovanie krajiny je založené na jej *obsahu*. V našom príspevku sa zaoberáme niektorými jeho problémami; dôraz kladieme aj na dynamiku krajiny.

Avšak skutočne novou ideou je identifikácia a mapovanie *fyzioognómie krajiny*.

Experimentálne sme sa pokúsili o metódu, ktorá je zameraná na vypracovanie dvoch máp. Prvá mapa reprezentuje nazeranie na krajinu podľa vertikálnej osi, ktorá dovoľuje charakterizovať horizontálne formy špeciálne v ich priestorovej štruktúre. Druhá mapa sa vypracúva a zakladá na pozorovaní na zemskom povrchu v horizontálnom smere a dovoľuje identifikáciu *profilu* i vertikálnych línii vo všeobecnosti.

Konečne vyjadrujeme niektoré myšlienky ako evaluovať krajinu z hľadiska použitia v krajinnom plánovaní.

Mapa 1. Fyzickogeografické údaje

1 — piesočnaté pôdy s tenkým humusovým A-horizontom a extrémnymi podmienkami odvodňovania, 2 — piesočnaté pôdy s hrubým horizontom a strednými podmienkami odvodňovania, 3 — piesočnaté pôdy s ílom a hrubým humusovým A-horizontom, stredné podmienky odvodňovania, hranice iných jednotiek A2: riečna dolina, A3: duny, D3: malé umelé jazero, C1: vresovisko suché, C2: les vlhký.

Mapa 2. Stará kultúrna krajina

1 — staré oráčiny, otvorená krajina, 2 — komplex oráčín a pastvín, drobná nepravidelná mozaika štvorcových a obdĺžnikových parciel; lineárne ohrady, 3 — prevaha pastvín, obdĺžnikové parcely, plantáže topoľov na komerčné účely, 4 — ihličnatý les na niekdajších vresoviskách, 5 — komplex oráčín a pastvín, veľká a pravidelná mozaika, lineárne ohrady, 6 — zámok s parkom.

Mapa 3. Vplyv modernizácie

1 — drobné súvislé sídla, 2 — sídla ako drobné jadrá (alebo zoskupenia), 3 — lineárne sídla, 4 — poľnohospodárska pôda, 5 — recentný les (vysadený), 6 — oblasti rekreácie.

Mapa 4. Evaluácia

3s sídla: hodnotené veľmi vysoko, 1s sídla: nízko, 30—3n: staré alebo nové: veľmi vysoko, 20—2n: staré alebo nové: vysoko, 10—1n: staré alebo nové: nízko, 0 nediferencované: veľmi nízko.

Mapa 5. Zastavané oblasti podľa funkcie

1 — sídla obytné, 2 — sídla, obchodné aktivity a služby, 3 — obchod, služby, 4 — poľnohospodárstvo, 5 — priemysel, 6 — iné.

Mapa 6. Zastavané oblasti podľa veku

1 — pred I. svetovou vojnou, 2 — medzi I. a II. svetovou vojnou, 3 — po II. svetovej vojne, 4 — komplexné.

Mapa 7. Zastavané oblasti podľa morfológie

1 — homogénne, 2 — homogénne, ľahko poškodené, 3 — heterogénne s homogénnymi časťami, 4 — heterogénne, 5 — uniformné.

Mapa 8. Morfológia vegetačných prvkov, historické objekty

1.1 — poľnohospodárska pôda, otvorená krajina, 1.2 — poľnohospodárska pôda, uzavretá krajina, 2.1 — ihličnatý les, 2.2 — topole, 3 — malé uličné záhradky (nízke), 4 — aleje, 5 — aleje a záhradky [nízke], 6 — záhradky s dospelými stromami, 7 — park, 8 — historické objekty (budovy, pamätníky atď.).

Mapa 9. Sekcie (relatívne homogénne).

Mapa 10. Evaluácia

1 — veľmi vysoká, 2 — vysoká, 3 — nízka, 4 — veľmi nízka

Obr. 1. Obsah krajiny

Obr. 2. Obraz krajiny

Obr. 3

Франс Снакен

КОМПЛЕКСНОЕ ИССЛЕДОВАНИЕ ЛАНДШАФТА, НЕКОТОРЫЕ ОСНОВНЫЕ ПОНЯТИЯ И ЕГО ИСПОЛЬЗОВАНИЕ

Выяснить является ли ландшафт чем-то «материальным» или это не что другое как изображение — я считаю напрасной дискуссией: ландшафт и то и другое, он материален, а в то же время он является также изображением. Материальную сущность ландшафта в трехмерном пространстве изучают и картографируют географы уже на протяжении длительного времени. Это картографирование ландшафта основывается на его содержании. В этой статье мы занимаемся некоторыми его проблемами. Подчеркиваем также динамику ландшафта.

Однако, совершенно новой идеей является идентификация и картографирование физиономии ландшафта.

В качестве эксперимента мы применили метод заключающийся в изготовлении двух карт. Первая карта представляет собой рассматривание ландшафта параллельно вертикальной оси, позволяющая характеризовать горизонтальные формы специально в их пространственном комплексе. Вторая карта составляется и основывается на наблюдении земной поверхности в горизонтальном направлении, что позволяет идентификацию и классификацию профиля и вертикальных линий вообще.

В заключении выражаем некоторые взгляды на счет вопроса: каким образом эвалуировать ландшафт с точки зрения его использования в ландшафтном планировании.

Карта 1. Физико-географические данные. 1 — песчаные почвы с мелким гумусным А горизонтом и экстремными условиями осушения; 2 — песчаные почвы с мощным горизонтом и средними условиями осушения; 3 — песчаные почвы с илом и мощным гумусным А-горизонтом; средние условия осушения
Границы прочих элементов: А₂: речная долина, А₃: дюны, D₃: небольшое искусственное озеро, С₁: заросли вереска, сухие, С₂: лес, сырой

Карта 2. Древний культурный ландшафт. 1 — древние пахотные земли, открытый ландшафт, 2 — комплекс пахотных земель и пастбищ, мелкая нерегулярная мозаика

квадратных и прямоугольных парцелл; линейные ограды. 3 — преобладание пастбищ, прямоугольные парцеллы, плантации тополей для коммерционных целей, 4 — хвойный лес на бывших зарослях вереска, 5 — комплекс пахотных земель и пастбищ, крупная регулярная мозаика; линейные ограды, 6 — замок с парком

Карта 3. Влияние модернизации 1 — мелкие и сплошные населенные пункты, 2 — населенные пункты как мелкие центры (или группировки), 3 — линейные населенные пункты, 4 — сельскохозяйственные угодья, 5 — современный лес (саженный), 6 — рекреационные районы.

Карта 4. Эвалуация. 3s — населенные пункты: оцениваемые очень высоко, 1s — населенные пункты: низко, 30—3n: старые или новые: очень высоко, 20—2n: старые или новые: высоко, 10—1n: старые или новые: низко, 0: недифференцированные: очень низко

Карта 5. Застройка по функции. 1 — населенные пункты, жилые, 2 — населенные пункты, предприятия торговли, обслуживание, 3 — торговля, обслуживание, 4 — сельское хозяйство, 5 — промышленность, 6 — прочие

Карта 6. Застройка по возрасту. 1 — до 1-ой мировой войны, 2 — между двумя мировыми войнами, 3 — после 2-ой мировой войны, 4 — комплексная

Карта 7. Застройка по морфологии. 1 — гомогенная, 2 — гомогенная, легко поврежденная, 3 — гетерогенная с гомогенными участками, 4 — гетерогенная, 5 — униформная

Карта 8. Морфология элементов растительного покрова, исторические объекты. 1.1 — сельскохозяйственные земли, открытый ландшафт, 1.2 — сельскохозяйственные земли, закрытый ландшафт, 2.1 — хвойный лес, 2.2 — тополя, 3 — небольшие палисадники (низкие), 4 — аллеи, 5 — аллеи и сады (низкорослые), 6 — сады со взрослыми деревьями, 7 — парки, 8 — исторические объекты (здания, памятники и т. д.)

Карта 9. Сектора (относительно гомогенные)

Карта 10. Эвалуация. 1 — очень высокая, 2 — высокая, 3 — низкая, 4 — очень низкая

Рис. 1. Содержание ландшафта

Рис. 2. Изображение ландшафта

Рис. 3

Перевод: Л. Правдова