

# Surveyor's Contribution to Sustainability: Today and Yesterday, in Literature and Graphic Arts

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**Key words:** geoinfomation, GIS, navigation, instruments, sensors, land administration, planning, construction, sustainability, literature, graphic arts

## SUMMARY

Geoinfomation, GIS, navigation, instruments and sensors, land administration, planning and construction: these are the fields of our daily business. These are our contributions to a complex and interdisciplinary world on the way to a sustainable development. But what can we see about surveyors in the daily news, in literature and graphic arts?

We will have a look to surveyor's activities in the last four thousand years

- to determine, measure and represent land, three-dimensional objects, point-fields and trajectories;
- to assemble and interpret land and geographically related information,
- to use that information for the planning and efficient administration of the land, the sea and any structures thereon,
- to conduct research into the above practices and to develop them.

(FIG Definition of the Functions of the Surveyor, 2004)

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## **1. INTRODUCTION**

Who built the historic Teben, city with seven town-gates? The kings, the engineers, the workers? During the inauguration of large buildings always numerous involved peoples are honoured. But participate also the specialists of the geomatics and the land management? And nevertheless: specialists of the geomatics and the land management are involved in these buildings. They create the bases, take part in project engineering, in the realization and in the enterprise. They guarantee the accuracy, the property and the mortgage on real estate. And sustainability. Geomatics and land management are considerably involved in the sustainable development. And that not only since sustainability is in all one's mouth, but for many thousands of years. The following texts and pictures will point out this development.

## 2. TO CONDUCT RESEARCH INTO THE PRACTICES AND TO DEVELOP THEM

Sustainable development begins with research for the practices.

The life of Alexander von Humboldt and Carl Friedrich Gauss in:  
*Daniel Kehlmann: Surveying of the world (Die Vermessung der Welt, 2005)*

Humboldt: The end of the way is in view, the measurement of the world nearly terminated. The cosmos will be more understand, all difficulties of human beginning, like fear, war and exploitation, would sink into the past. The science will cause one age of the welfare.

Gauss came to speak on the coincidence, the enemy of all knowledge, whom he had always wanted to defeat. From the proximity regarded, one sees the infinite refinement of the causal fabric behind each event. If one withdraws far enough, the large samples revealed themselves. Liberty and coincidence are a question of the middle distance, a thing of the distance.



Alexander von Humboldt, 1800.

„He took the compasses from god’s endless workshop, to describe this universe and all creations: (...) so wide expand your limits, this is your perimeter.“

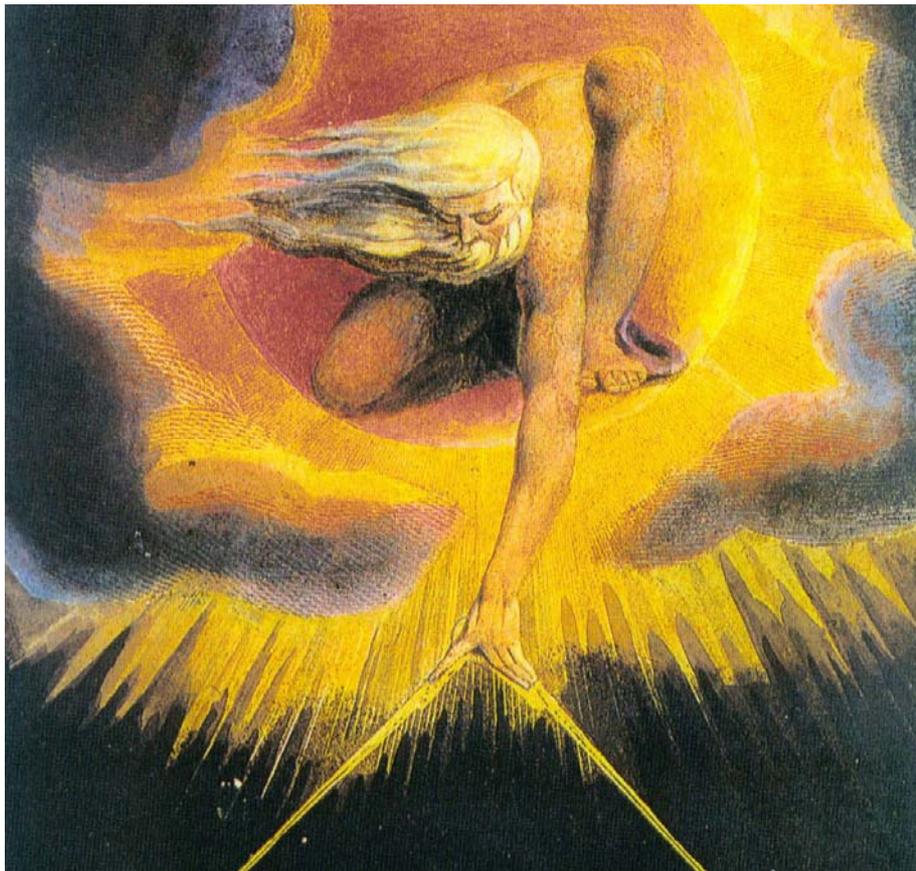
*William Blake: Paradise Lost (1800)*

„At the foot of the mountain he planted a staff and told the gods of the valley: From here upward I recognise land of god, from here downward I have to cultivate my fields.“

*Japanese legend (6. century)*

„He verged the land , measured it and gave it to his children to possess it as holy land.“

*Maya legend*



William Blake, 1800.

### 3. TO DETERMINE, MEASURE AND REPRESENT LAND, THREE-DIMENSIONAL OBJECTS, POINT-FIELDS AND TRAJECTORIES

Land registration for sustainable development.

"I touch, carefully, with pointed fingers, and release immediately. I make triangles. And with the point of the triangle I seize the world. On the paper and on the maps I catch it. All surveyors catch the world and release it immediately."

*Hans Boesch: The spell (Der Bann, 1996)*



Carigiet, 1963.

„New people arrived and digged mysterious fosses, rove about planning, measuring, computing.“

*Meinrad Inglin: Urwang (1954)*

„One morning the surveyors appeared. The presence of these creatures spread a big horror.“

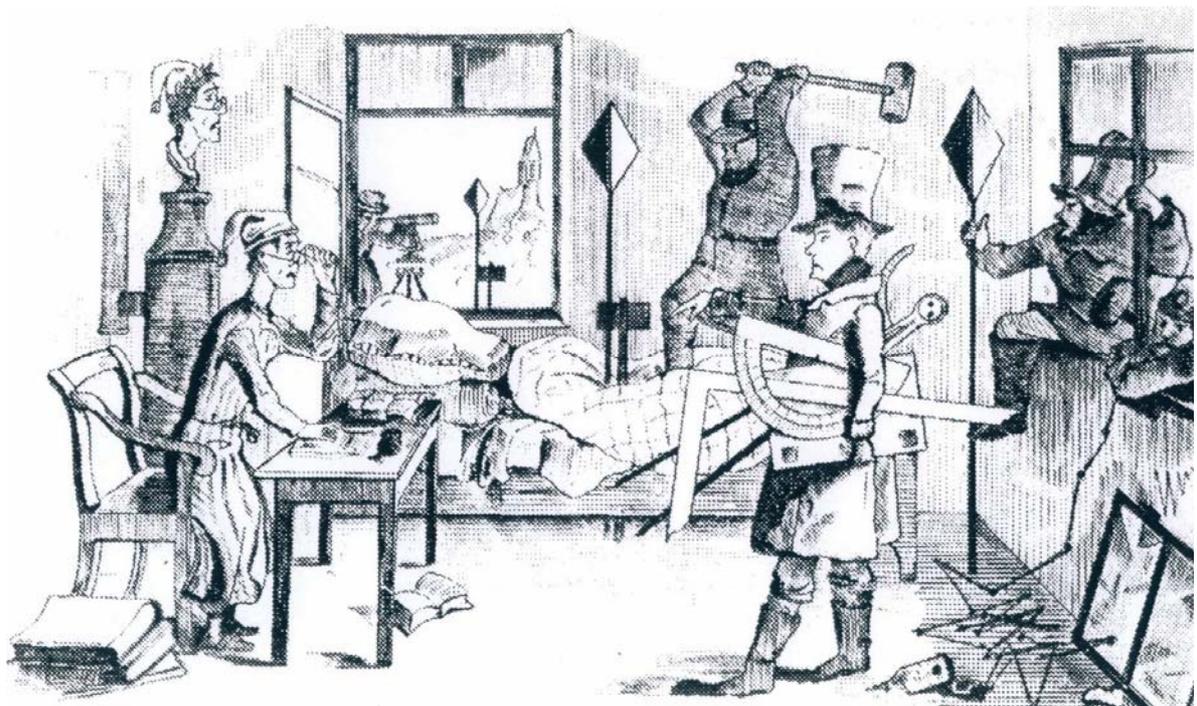
*Alejo Carpentier: The Empire of this World (1940)*

„Wednesday arrived a staff of engineers, hydrographers, topographers and surveyors. They changed rainy seasons, speeded up the circulation of harvests, guided the river out of its old bed.“

*Gabriel Garcia Marquez: Hundred Years of Solitude (1967)*

„It wasn't easy to convince a surveyor that a heap of river stones are the eggs of a snake or that a pink sand-stone gobbet was the liver a kangaroo killed by a spear.“

*Bruce Chatwin: Songlines (1987)*



„At cataster office I was daily eight hours with boring work and with boring people who sweated and were unclean and badly combed.“

*Jean-Jacques Rousseau (Confessions, 1781)*

„(...) a drunken surveyor, only able to gauge the meadow (...).“

*Gottfried Keller: About Jeremias Gotthelf (1849)*

„When he was drunk, he never made a measuring mistake, never a wrong addition!“

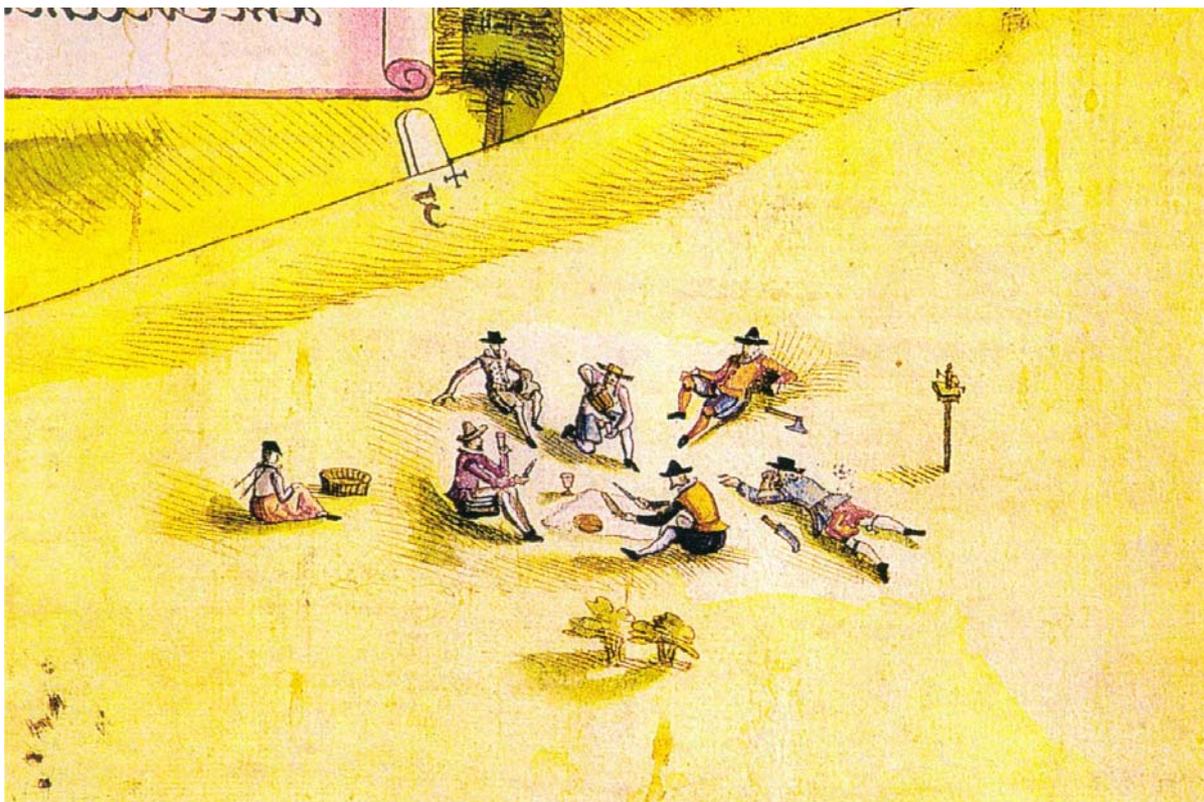
*Emil Zola: The Earth (1887)*

„Before lawcourt was a scrubby and drunken surveyor alleged for corruption, and he was discharged (...).“

*Anton Cechov: Platonov (1880/1923)*

„Bella Barnes was going to marry a surveyor, a wildish young fellow, but a good one to work as ever was. (...) she thought she'd find a way to keep him out of debt and drinking and gambling too.“

*Rolf Bolderwood: Robbery Under Arms (1888)*



Detail from a map.

„The opening of the railway line! - the Governor and all!  
With flags and banners down the street, a banquet and a ball.  
Hark to'em at the station now! They're raising cheer on cheer!  
'The man who brought the railway through - our friend the engineer.'  
(...)  
'Twas my old husband found the pass behind that big red hill.  
Before the engineer was born we'd settled with our stock  
Behind that great big mountain chain, a line of range and rock -  
(...)  
He vanished in the wilderness - God knows where he was gone -  
He hunted till his food gave out, but still he battled on.  
(...)  
Then others came across the range and built the township here,  
And then there came the railway line and this young engineer;  
(...)  
My poor old husband, dead and gone with never feast nor cheer;  
(...)  
*Andrew Barton Paterson: The First Surveyor (um 1900)*



Pro Hart: The First Surveyor, 1974.

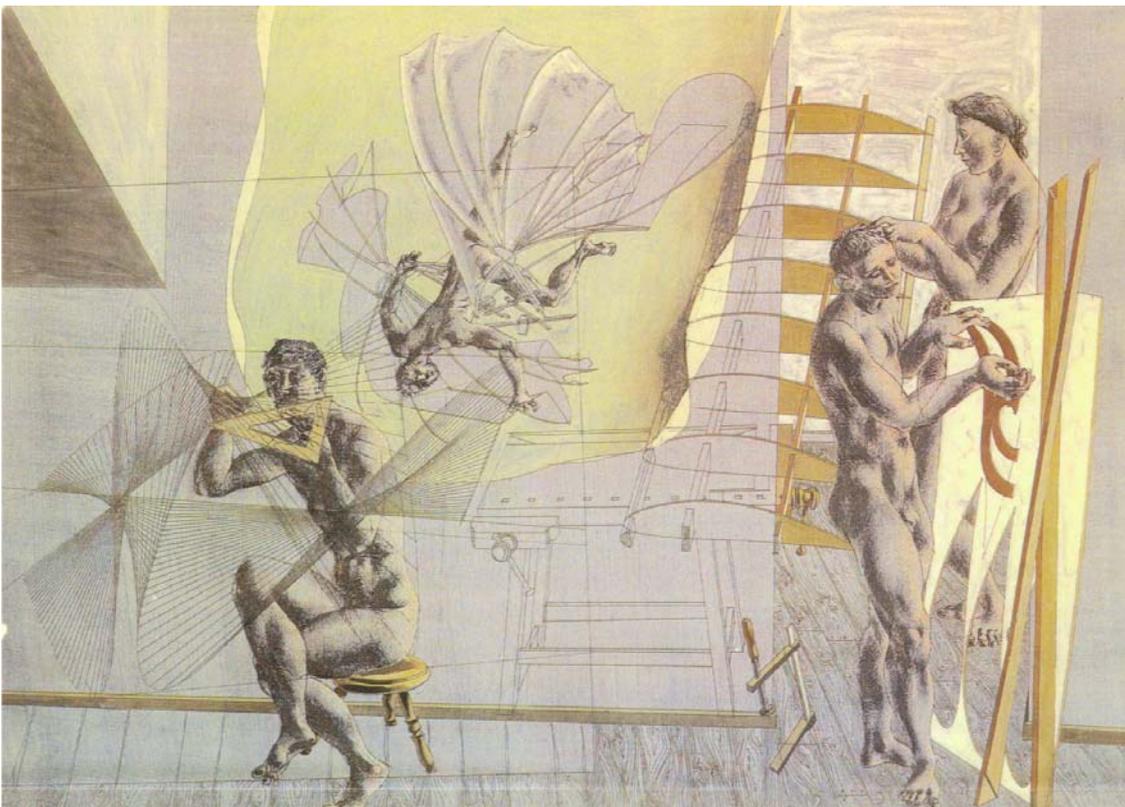
#### 4. TO ASSEMBLE AND INTERPRET LAND AND GEOGRAPHICALLY RELATED INFORMATION

Land administration for sustainable development.

The Italian Carlo Carra painted the wife of the surveyor and engineer in 1921. How does she look at the surveyor? We find the answer from a man's point of view and from a woman's point of view in two Swiss fictions:

„He kisses as he calculates the cube root, strictly orderly and cool. (...) He was glad, when the ceremonies of the wedding were over and he was again between his instruments and projects. This was his passion: to measure, to calculate, to count, to draw angles and circles. She knew, this man would never be able to love a woman, he already had one – geometry!“  
*Federer Heinrich: Mountains and Men (1911)*

„I exist in his schedule. Papers of me are kept in his office. A person like me has to be unbearable for a surveyor like him.“  
*Margrit Schriber: Roots of Air (1981)*



Hans Erni, 1950.

## 5. TO USE THAT INFORMATION FOR THE PLANNING AND EFFICIENT ADMINISTRATION OF THE LAND, THE SEA AND ANY STRUCTURES THEREON

Land management for sustainable development.

Egypt grave painting (1420 BC): Surveyors measuring the fields overflowed by the river Nil.

Navigation and geodetic surveying was supposed to find the new worlds. Surveyors were from the first days with the sappers. Many paintings show surveyors at work (St Gill, John Longstaff). This painting tradition continues still today. Pro Hart, Hugh Sawrey, Geoff La Gerche and other painters frequently use the motive of surveying.

Rivers are restrained, land becomes fruitful:

Some paintings show the work river corrections. (In Switzerland: river Kander 1712, river Rhone 1888.)

Agriculture made a big progress with steam ploughs:

„Six machines in full activity, each of them with a comets tail of straw smoke, are very elating. The lonely silent fields have already a quite different air.“

*Max Eyth: In the Stream of our Time (1871)*

Railways conquer the land:

Painters show the surveyor at work for railways (Albert Anker 1888).

Town planning and buildings are also subjects of art.



W.L. Kozłowski, 1932.

Roads and bridges:

Surveyors are also participated in road and bridge construction. Some authors describe collapses of bridges:

"Suddenly, before us sharply cut off, the end of the bridge, exceeded in the empty nothing. The enormous iron bars had disappeared, blown away without a trace."

*Max Eyth: Tragedy of profession (1899)*

"However the bridge of Santa Maria del Miracolo is nevertheless more surely than all your concrete bridges. These forty-four students have taken a nice bath ... for the higher fame of the uncle Antenore, professor for construction science."

*Carlo Emilio Gadda: Sketches of Milano (1943)*

Railway:

Some Swiss examples: Painter Anker represented the surveyor with the measurement for the railways. Moeschlin (*We perforate the Gotthard*, 1947/49) described the railway construction through the Swiss alps in a fact novel; therein the measurement work is described in detail. Bolt described the building of the Jungfrau mountain railway in Switzerland (*Svizzero – the history of a youth*, 1913). Federer (*Mountains and humans*, 1911) arranged a novel around a project for a further mountain railway in Switzerland.

"Isn't it human strength to drive up on this rock, where nobody ever saw animals, with locomotive and cars fully of peoples?"

*Heinrich Federer: Mountains and humans (1911)*

Dürrenmatt gives still another meaning to the railway and the tunnel:

"We move on rails, the tunnel must lead us somewhere. Nothing proves that the tunnel is not correct, except that it does not stop."

*Friedrich Dürrenmatt: The tunnel (1952)*

Town construction:

The surveyors work partially also as town planner and real estate property appraiser. In this function – like generally town planners and architects – they have to fight often with doubts:

"Because my mistakes, reinforced concrete around me, can be corrected only with dynamite."

*György Konrad: Stadtgründer (1975)*

"You know the fact that I am actually an architect and should build houses, but I never built them, I only blown them up."

*Heinrich Böll: Billiard at half ten o'clock (1959)*

## **BIOGRAPHICAL NOTES**

Consulting engineer for geoinformation, environmental engineering and spatial and town planning

Editor of the Swiss professional journal „Swiss Geomatics – Geoinformation and Land Management“

Author of several papers in Swiss and German reviews

Committee of professional associations:

Swiss Association of Geomatics and Land Management geosuisse (FIG delegate and responsible for public relations)

Swiss Association for Spatial and Town Planning

Swiss Association for Geo-Information

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