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## **Consciousness in Historical Time Tacitus on the Suiones**

**Bernhard Bierschenk<sup>1</sup> (Ed.)**

*Abstract* Since knowability must emanate from the single individual, singularity constitutes the frame of reference, and the embodiment of knowing is expected to emerge through individual text production. Furthermore, the basis of the presented studies will consist of text materials with unknown frame factors. This is especially underlined by the fact that history at the Times of Tacitus was an art, not a science. It follows that only the individual text producer, namely Tacitus himself, can provide the unique physical space-time context. Only he has the capability to produce a discourse on the given subject. This capacity is contributing to the fact that the present approach is binding intentional dynamics to the production of textual movement patterns. Finally, structure cannot be imposed a priori, but can only be discovered. Thus, the question to be answered need to address the kind of structure that is establishing itself during production. The Latin text of Tacitus on the Suiones makes up the precondition for the establishment of Potential Energy Surfaces (PES) as well as Free Energy Surfaces (FES). In two separate although connected studies, strings of graphemes provide the foundation for the unfolding as well as folding of their textual resonance spaces. Thereby, produced and shaped consciousness can be established and described structurally with two global state attractors, carrying the inclusive names of Safeguard for Intention and Mastery for the Orientation. Hence, the basic focus will be on textual pattern dynamics as outcome of a subtle interplay between intentionality and orientation, for which the AaO axiom provides the proper foundation.

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### **Introduction: Involution and Evolution** Bernhard Bierschenk

Especially from the Swedish point of view, the writings of Tacitus on the Suiones have been the object of previous studies of European thought (B. Bierschenk, 1993). With respect to briefness, his prose is dense, ambiguous and intertwined which leaves space to alternative translations. However, devotion and sternness in the path taken in Tacitus' text building behaviour is discoverable by studying the flow dynamics of its strings of graphemes. Crucial for the specification of the operating transformations has been to establish a link between the invariants of writing and the produced style. Furthermore, to catch the fundamental implications of the string-concept in the context of evolutionary language dynamics, string movements have to be observed at the textual level. It follows that complex systems and nonlinear dynamics constitute the new condition, which is founded on the assumption that (1) self-sensitivity is related to lawful regularities in string movement, (2) local symmetries specify semantic-free patterns of strings, and (3) phase-dependency (asymmetry) of string displacements are producing open spheres.

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In a most fundamental sense, the study of its morphogenesis and structural stability must begin with the observation of discontinuity (Winfree, 1980, p. 28). Thus, man-environment interactions have to be synthesized into conceptual relations. By stringing together graphemes, these relations become manifest. Since strings of graphemes are generating sequences, they are specifying their rotational dynamics in a simultaneously developing textual space. Moreover, the hypothesis of a textual space relates to the fact that evolving space (Greene 1999; Wheeler, 1998) is restricting string-rotation and movement. The hypothesis of string rotation implies that any textual expression is suitable for processing, provided that its textual form contains cues to its capacity of stretching and straining, and of winding and curling. Therefore, a text material has to respond in an elastic way to the evolving dynamic of textual pattern movements. It is therefore not a coincidence to suggest that a text material is characterised by dynamic properties and that these are decisive for the textual space being realised.

For a discovery of the intentional dynamics put into text, one must be able to approach the text producer's point of observation as well as his points of view and to recover the underlying rotational (i.e. attitudinal) changes step-wise and according to Baeyer (1999, pp. 12-14) "without intervening dissociations and in perfect order". In a more abstract sense, observations, put into writing, have the function of letting objectives as well as a perspective come into existence. Based on previous studies (B. Bierschenk, 2005), it can be stated that textual pattern movements have to be made manifest. From the rigorous behaviouristic position, it is essential to note, that the captured text building behaviour is the result of the precision in the working mode of the developed bookkeeping procedures.

In the following, it is demonstrated that the AaO-axiom, underlying the synthetic proposition, forms the foundation for the treatment of intention as well as orientation. To put both into writing is necessarily dependent on the text producer. Both, the text producer's intention and orientation, are discoverable through the AaO-mechanism, which is biologically rooted and embedded in the complexity of natural language systems.

A concentration on individual text building behaviour is the condition that has made it possible to demonstrate configurations of [AaO] systems and to extract the direction in the identified movement patterns. From the system's point of view, the approach path of (A) and (O) respectively refers to directiveness in the biological sense. With respect to specific language solutions, it refers to changes in the dynamic behaviour of the [AaO] systems that provide the basis for proper solutions offered through the equilibration of the developing language equations.

In sequencing textual elements, finding the solution to developing language equations is dependent on the way in which perceived relations between mental abilities and text building behaviour have been coordinative. The premise is that the information in the textual medium is sufficient to account for what of the shapes of mind remains invariant over change. Some of the textual elements may be more fundamental than others in providing information, but there is no information from which relations that are more complex can be calculated.

Conceived in the perspective of Functional Text Geometry (B. Bierschenk, 2011), achieved rotations will make apparent that irreversible processes appear as instabilities at the kinetic level and as stabilities at the kinematic level. In particular, Energy Landscapes (EL), obtained from dynamic and thermodynamic properties, allow a global view on the produced performance. Subsequently, EL includes both Free Energy Surface (FES) as well as Potential Energy Surface (PES), which is a more fundamental entity, since there is no requirement for a subjective parameter choice (Wales, 2003, pp. 1-2).

At the PES level, rings (B. Bierschenk, 2001a, b) operate on semantic-free graphemes and grapheme strings. Independent of a particular language, writing must be reflected in intertwined ring functions. Since the generation of a configuration of composites presupposes

stability in the folded rings, it provides the key to the manifestation of adaptive structures. The developed Agent-action-Objective (AaO) formalism has the capacity to connect the “quantum-function of spinning strings” (B. Bierschenk, 2001b) to energy flows in textual expressions. Symmetries, because of non-commutative measurements, are thereby tied to information concentrating processes.

A biologically important link exists between the changes in kinetic and kinematic processes that produce and shape the flows. This has become apparent because the AaO-mechanism works in a rhythmic and clock-like manner. At first, the mechanism is producing a simple ring structure. Its most fundamental unit is the ring, which is producing compounds and is stringing together graphemes. The processing begins with the expression of kinetic energy through cyclic writing activities. Thereby, second order patterns (I. Bierschenk, 2011) are governing the development of dynamic string relations which are important in the evolutionary development of waves in textual flows.

A cycle in its most primitive form of expression contains a string, which is curling, and gaining in complexity as the writing activity goes on. Writing implies that the (a) of the AaO-system is reaching a phase where strings of graphemes develop into layered composites. Sufficient incorporation implies that the character of the text producer becomes textually embodied. Hence, the most primitive form of an emerging string becomes approachable through an AaO-ring, which contains a verb (‘verto’), referring to (‘verti versum’). It implies growth and means a systemic infolding of “en-ergon” (Feeke, 1976) in the form of an energetic potential. Equally important is the nonlinear dynamics of the verb-function. The German verb (‘werden’) and the Swedish verb (‘varda’) are reflecting becoming or growth. Since an evolutionary growth of text presupposes that its body must revolve in AaO-rings, the verb stands for expended energy. This implies simultaneously a changeable texture in which strings of graphemes are twisting and twining. Thereby, vortices specify their energetic properties.

The capacity to trace these rotational patterns in an open spherical space (Winfrey, 1980, p. 8) comes from the observation that the A-domain is contributing to the formation of covalent bonds. The function of bonding is to account for the fading. Produced open AaO-systems in which AaO-rings are linking together their encompassed A’s and O’s, make their phase-dependency apparent. Thus, an energetic potential means unfolding a textual flow. Furthermore, it means that an AaO-ring exists because of its innate properties. For this reason, the texture of a text must carry the producer’s intention through fading of the textual agents and orientation through sinking of the textual objectives deeper and deeper into the ongoing conceptualisation. In producing abstract spaces, the evolutionary progress begins from the lowest point in their textual embodiment.

A number of procedures exist for identification and bookkeeping of manifested textual movement patterns (I. Bierschenk & B. Bierschenk, 2011). Their development reflects lawful relations, which may be symbolised as copies (B. Bierschenk, 2011). Hence, the AaO-principle becomes functional, in the moment when a copy of its components is being realised. By functional it is meant that a standard copy (Hardison, 1999, p. 126) is produced [AaO]. This process is going on irrespective of its meaning. Duplications take place and the copies of copies are interacting in strictly mechanical terms. However, copying requires that some AaO-rings are incomplete. Incompleteness is to hand when at least one or the other A- or O-component is missing at the textual level. Expression:  $[\emptyset_{Aa}\emptyset_{O}]$  is symbolising this situation. Thus, cooperative interaction between different AaO-rings becomes possible through the placeholders, which are the dummies influencing potential energy flows.

Further, it will be demonstrated that an incomplete AaO-unit functions either as an indicator of structural relations or as a communication tool in connection to the channelling formation of the dummies ( $\emptyset$ ). Thus, the coordinative interaction between AaO-units of

different complexity has an influence on the evolutionary process that generates radical time morphologies. The evolving variable configurations can form swiftly in order to channel textual flows.

A complete textual surface can be produced only under the condition that the dummies ( $\emptyset$ ) can be supplemented with text segments. The copying of the [A,O] states at places, where the missing text segments need to be inserted, is carried out in agreement with the following format:  $[\emptyset]+S \rightarrow [\emptyset_{A,O}] \rightarrow [\emptyset]+S \rightarrow [\emptyset_{A+O}] \rightarrow [\emptyset]+[\emptyset S]$ . The developed procedure for supplementation (S) implies a copying with a focus on the involved flow dynamics. The dummies  $[\emptyset]$  in the expression are marking the places for incoming text segments. Moreover, indexing with the components [A,O] means that geometric conditions are governing the layering of text segments.

For example, a single A- or O-component implies that the surface-oriented empirical relation is utilising a perpendicular pathway and appears single-layered ( $^1D$ ), while their composite is utilising a collinear pathway, which implies that a twofold-layered text segment ( $^2D$ ) is channelled into its proper place. Moreover, the attitudinal values of displacement (D) can be detected through angular articulations. When a certain number of revolutions through the angles have been processed, the result appears at the textual surface level as multiplicative redundancy.

A precisely definable number of messengers (B. Bierschenk, 2011) is steering and controlling this algorithmic working process. Furthermore, focusing on angular articulations means focusing on different fitness values (measured in radians). These values constitute the expression of an articulation in the “functional clause” (I. Bierschenk, 2011). The radians allow the demonstration of value integration. Moreover, directional rotation in the messengers is essential. Through proper localisation of corresponding function-value integrations, changing states are producing covalent bindings, which restrict the number of possible angular positions to very few. Since the direction of binding varies systematically, it reflects structural change.

Since the clocking mode of the discovered mechanism solves language equations, their solutions must fall out within the context of natural language systems. These systems contain their own intrinsic coordinates and exhibit periodic behaviour. However, the coordinate-free and consequently invariant description of their A-O-kinematics refers to the establishment of energy landscapes through which writing styles can emerge and be abstracted. In confining the production of open spheres to the working of two clocks, namely the A-clock, governing the rhythmic movements of in the Agent-component of the AaO-paradigm, and the O-clock, governing corresponding movements in the Objective-component, wholeness and order can be apprehended. Thereby, it is made obvious that text production implies displacement through rhythmic movement patterns, which can be measured with precision. In using phase-dependent displacements of strings of graphemes, it is possible to determine the rhythmic, clock-like working mode of text building behaviour in the study of synthesising processes.

A morphological configuration must resonate in the proposed system for the exact measurement of the dynamics of textual movement pattern. As demonstrated in previous articles, the AaO mechanism is rhythmically driven by a flow of kinetic energy. One aspect of the mechanism is related to the identification of the order variables for a description of the displacement dynamics. These variables simplify the description of phase transitions and give expression to the order of a particular system at transition time. Thus, a behavioural addressing of the fundamentals of the involved clockwork must be related to the periods and fractions of periods generated during text production.

## Flow Dynamics in Ancient Latin

### Inger Bierschenk

The text to be studied concerns *Cornelii Taciti de origine et situ Germanorum (or Germaniae) liber*, Chap. 44:

[2] *S u i o n u m hinc civitates, ipso in Oceano, praeter viros armaque classibus valent. forma navium eo differt, quod utrimque prora paratam semper appulsui frontem agit. nec velis ministrant nec remos in ordinem lateribus adiungunt: solutum, ut in quibusdam fluminum, et mutabile, ut res poscit, hinc vel illinc remigium.* [3] *est apud illos et opibus honos, eoque unus imperitat, nullis iam exceptionibus, non precario iure parendi. nec arma, ut apud ceteros Germanos, in promiscuo, sed clausa sub custode, et quidem servo, quia subitos hostium incursus prohibet Oceanus, otiosae porro armatorum manus facile lasciviunt: enimvero neque nobilem neque ingenuum, ne libertinum quidem armis praeponere regia utilitas est.*

Alf Önnersfors formulates a traditional characteristic of Tacitus' style in the preface to his translation into Swedish of Tacitus' text (98/1960):

*.../ its text building is short and compact, restless and often asyndetic and antithetic. .../ Tacitus refines .../ especially the brevity of expression, which at times makes his production abstruse, .../ (pp. 27-28) [author's translation]*

Önnersfors is characterizing a grammar that is unbound in its syntax and complex in its morphology and thus offers several interpretations of the content and message. He thus provides examples of criteria for a style that bears the stamp of the author's personality. The question is whether a geometric description can show the extent to which Tacitus' refinement of the brevity and compactness in the expression has its counterpart in a space-function and whether the method can trace the writer's sensitivity in relation to the environment he wrote about. First, some comments on the preparation of the Latin text for a Vertex-analysis.

#### *Comments on the text analysis*

Central to the text handling is the discernment of all string of graphemes that are verbs, because the verb has the function to separate Agent from the Objective. The definition of the verb in a Vertex-analysis is discussed in I. Bierschenk and B. Bierschenk (2011, p. 6). As a verb count finite and infinite forms and participles (which belong to the verb forms, but are used with noun and adjective endings) and also gerundium and gerundivum, which are special Latin forms. A few places in the Latin text need to be clarified. In the middle of line five appears the phrase 'iure parendi'. It has been translated into Swedish as 'rätt till åtlydnad' by N. E. Hammarstedt 1916, and 'rätt till lydnad' by Per Persson 1929, i.e. ('right to obedience'). Persson explains the meaning as 'to become obeyed'. (Both quoted from Martinsson, Tacitus.nu). Önnersfors is using 'rätt att kräva lydnad' ('right to demand obedience'), which is a more active meaning. The form 'parendi' is the conjugation form of Gerundium and thus treated as a verb. On the second last line, 'armatorum manus' has been translated with 'beväpnade män' ('armed men') by Önnersfors and 'hopar av väpnade' ('crowds of armed') by Hammarstedt, while Persson is using the more literal 'beväpnades händer' ('hands of armed'). The form 'armatorum' is treated as a verb.

As is known, a traditional identification of subject and object in a Latin sentence is governed by their inflection and not primarily by their position in relation to the predicate verb. Strictly, a Vertex-analysis builds on the condition that the A-position means before the verb and the O-position means after the verb. It is independent of semantic interpretation, since the Agent component is not the same as subject (studied e.g., in I. Bierschenk, 2011).

The expression ‘est apud illos et opibus honos’ at line four (literally ‘is (has) by them also richness reputation’) has thus an empty A-position, which is indicated by dummy symbol ( $\emptyset$ ).

When the magnitudes of the variables are computed for input into a graph program, then an empty position immediately at the beginning of a clause ( $\emptyset_A$ ) or at the end ( $\emptyset_O$ ) implies that the value entered for the empty variables is zero (0), in case the sentence marker signals the end of a period. However, if the text continues, the overall flow may still give rise to a dynamic whole depending on the values of the filled string rotations. Moreover, as the example below will show, there will be a ( $\emptyset$ ) which get its value from the rotations of the preceding or following clause, in case a comma or equivalent clause marker signals a border to be crossed. The dummy to be substituted means that the inserted value is a shadow, which is calculated as the root of a material value. The question is therefore whether and to what degree the Latin text presents enough of these empty spaces to guarantee a dynamic flow and thus a living space.

### **Magnitudes of String Rotation**

For illustrative purposes, a sentence from the Latin text shall be used: ‘*forma navium eo differt, quod utrimque prora paratam semper appulsui frontem agit*’ (first two lines). (Literally ‘form of ships therein differs, that on both sides stem prepared always landing front offers’). The boats were pointed at both ends to easily be managed.

The two components (A) and (O) are driven by a movement, similar to a pendulum. Its impact must be asymmetric in order to generate synthesis or meaning. Certain principles are clarified in Table 1.1.

**Table 1.1**  
*Magnitudes of string rotation in a Latin sentence*

Clause	String	Translation	Count	Messenger <sup>2</sup>	Sum Rad <sup>1</sup>
2	forma	form	5	A5	
	navium	of ships	6		
	eo	therein	2		A <sub>2</sub> =4.4902
	differt	differs	7		6.28+(0.0628⊗7)+0.628
	∅			O9	7.3476-(√4.9612+√5.2752)
					O <sub>2</sub> =2.823445
3	,		1		
	quod	that	4		
	utrimque	at both sides	8	A5	
	prora	stem	5		A <sub>3</sub> =4.9612
	paratam	prepared	7	O5	
	semper	always	6		
	appulsui	landing	8		
	frontem	the front	7		O <sub>3</sub> =5.2752
4	*				
	∅			A8	5.5-(ROT(4.9612))
					A <sub>4</sub> =3.272625
	agit	offers	4		0.314+(0.0314⊗4)=0.4396
	∅				0.00
	.			O1	0.314+(0.0314⊗1)=0.3454
					O <sub>4</sub> =0.785

<sup>1</sup>Hestenes (1986/1993, p. 75) emphasises that the exponential function and its series expansion requires that the angles are measured in radians: [arc  $\alpha = 2 \pi (i \phi / 360)$ ] and [arc  $\beta = 2 \pi (\theta \text{ in } / 360)$ ].

<sup>2</sup>The baseline values are nine per component A and O and are detected by the pattern of the Messengers.

Repeated textual segments, marked through copies, become coupled on the vertical axis. Vertical coupling is a mark of spiralling structure as well as an indication of an evolving configuration, which is the result of a “winding factor” (Winfree, 1980, pp. 14, 244). Winding ( $W$ ) in the strings of graphemes is calculated with the base value ( $W=1/1$ ). This is a virtual rotation. On the physical level, however, the rotation includes variables in the form of words whose magnitude is defined with ( $W=1/10$ ). This value will be added to the base. On the material level, the magnitude of the graphemes is defined with ( $W=1/100$ ). At this level, the graphemes are counted and the count is used for multiplication. A closer investigation into the calculation principle together with empirical results may be found in, e.g., B. Bierschenk (2001a) and I. Bierschenk and B. Bierschenk (2011). An illustrative example follows below.

To obtain the string rotations of each component (e.g., *forma navium eo*) we count first the graphemes of a string and calculate the value ( $0.0314 \otimes 5$ ) and add the value for the component string (0.314). The next following string rotations are calculated in the same way. Finally we add the base value (3.14) and the summation of the rotation in the A-component is shown at the right ( $=4.4902$ ).

The example of Table 1.1 shows that a placeholder may signal that the roots are to be found in another clause. Such a case occurs in the second clause. To calculate we take the base value of the placeholder, add the value of the verb and add the sums of A5 and O5. Thereafter we detract the root of these sums from the value of the placeholder, which give a final rotation value of ( $=2.823445$ ). This means that the value of an intangible (shaded) string of graphemes has been retrieved. The variable notations provide the basis for the x-axis of the potential energy surfaces.

### ***Potential Energy Surfaces***

The magnitudes of the string rotations make the morphogenetic properties apparent, which lead to the generation of time-dependent trajectories. At first, it would seem unlikely, that a separation of the A- from the O-component would lead to comprehensible results. However, testing the effects of separation will be studied with the following strategy. In a first step (1), the Intention space of the A-component is developed followed by a second step (2), where the Orientation space of the O-component is developed.

At a first glance, this strategy may seem to destroy the strict dependency, i.e., their spinal chord. However, if this separation would lead to the establishment of a bi-componential disparity of intention and orientation, this would be seen to be a very radical test on the validity of the AaO-approach (Greene, 1999, p. 278).

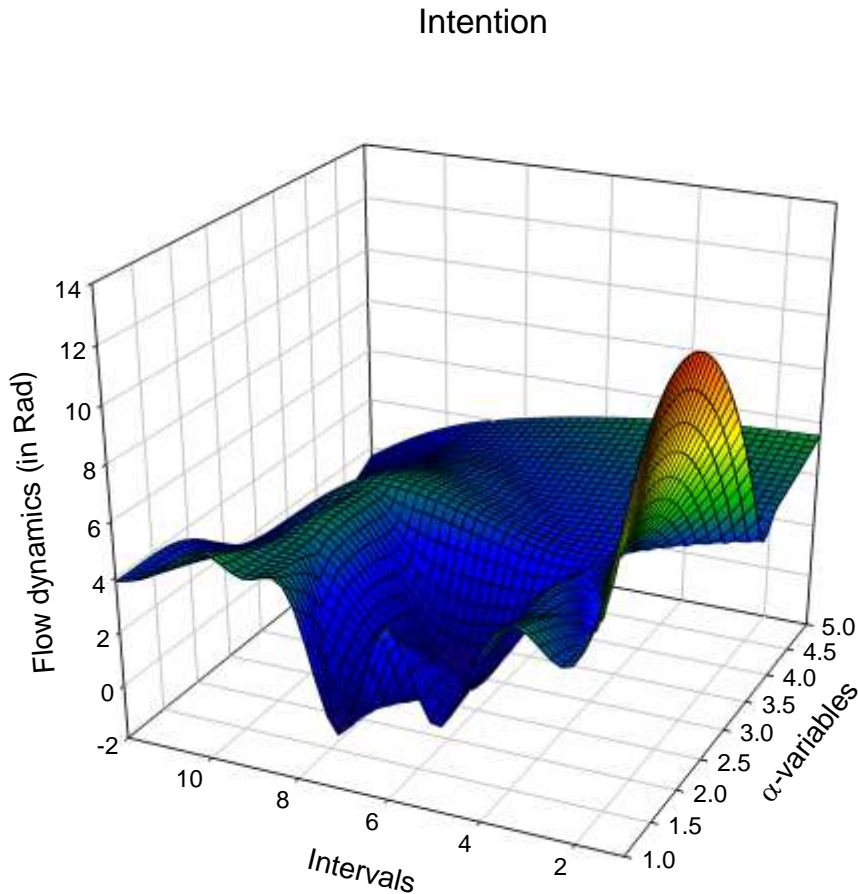
Shadings around some preferred phase relations (italics in Tab. 1.1) are demonstrating the kind of change that can be determined within and between the periods and the fractions of a period that are critical in the production of a particular text. For this reason, it is quite natural that the spectrum of a space must take into account the way in which the variables of the components are sliding over the intervals (marked with comma and full stop in Tab 1.1).

In producing intervals through its own internal processes, text production is gating itself in its structural development, and consequently its self-organising tendencies. Hence, periods and fractions of periods are determining the intrinsic system of coordinates and the involved transition. Generated intervals have been identified as the fundamental control parameter, which is governing the timing of information synthesising processes at the ecological level. In studying the outcomes of this clockwork from a kinematic point of view, an attempt is made to describe the theoretical significance of the resulting morphological configurations. It follows that the subject matter in the present study concerns the shape of temporal morphologies.

Fully analysed, the text is entered into a graphing program (here SigmaPlot, version 11, 2008). The two components, demonstrated in Table 1.1, have been split into separate



graphs. The variables ( $\alpha$ ) of the A-cases and the variables ( $\beta$ ) of the O-cases are entered into the order of the x-axis while the y-axis indicates the number of time intervals. As illustrated in Table 1.1, an interval is delimited by punctuation marks and must include at least one verb. The z-axis indicates the magnitudes, which are governing the development of the graphs of Intention, shown in Figure 1.1 and Orientation, shown in Figure 1.2.



**Figure 1.1** *Flow dynamics of the Agent*

The graph shows how the text will look like when its production is transformed to a geometric shape. We thus get a three dimensional image of text development of the agent and a complementary picture of the development of the objective. The graph presents the text as a piece of billowing fabric, which is a visualisation of what texture is.

*Comments to the reading of a graph:* The loading of the data has been done from left to right, as in ordinary natural reading. This means that the reading of the textual flow dynamics must be done from the right instead. On the x-axis, the drift is shown that marks the progression. The proliferation, read off the y-axis, is coordinating the direction in time with the thermodynamic processes. Speed and acceleration is expressed by the radians on the z-axis. Note that the program has converted the textual intervals into a scale.

#### *The Agent surface*

First, we study the intentional flow dynamics of (A) and compare some of the asymmetries in this sequencing space with corresponding places of textual articulation. In the first interval appears the maximum rotation value, observed as a strong and rapidly inflated wave crest. This is accomplished through the first explicitly expressed agent variable, which

is made up of specifications before the verb (*Suionum ... classibus*). Its magnitude is ( $\approx 10.91$ ). A fold is formed after the next interval, which implies a lower rotation value ( $\approx 4.49$ ). Hence, this agent variable (*forma navium eo*) is less prominent. Moreover, the shape is slightly undulating, which means that the values are rotating evenly.

Towards the middle of the text, it reveals a slower movement that seems to suck the texture down. A closer look reveals that in the fifth interval and before the verb form ( $\emptyset$  *solutum*) a deeper fold ( $\approx 1.15$ ) is visible. Here, the flow is dependent on the agent (*nec velis*). Since it is copied, which is sliding over two clause markers, the root has been extracted twice. The deepest tip is in the seventh interval and is the result of a dummy variable. It marks a totally non-integrated agent (X), which cannot be replaced by the value of a preceding agent due to the A-position, which is the beginning of the sentence ( $\emptyset$  *est apud illos...*). It is also emphasised in the text that a new paragraph begins here. This place serves as a temporary flow stop (magnitude=0). A deep is further present in the last interval ( $\approx 1.18$ ), which you need to imagine, because it is hidden behind the last tab at the left in the graph.

According to Önnersfors as well as many others who have commented on Tacitus' writing manners, characteristic is its epigrammatic terseness and vividness. One such example can be found at the very beginning through the verbless phrase (*Suionem hinc civitates, ...*). Thus, the first lively agent may be perceived as an example of a rhetorically elegant way of introducing a topic, which serves as a prelude and allows the reader to take the writer's position (e.g., And now to the communities of the Suiones ...). A control in some official European translations of this passage show that only the French and the English versions are following this expression truly and that in the Italian, German, Swedish, and Danish, a verb has been inserted.

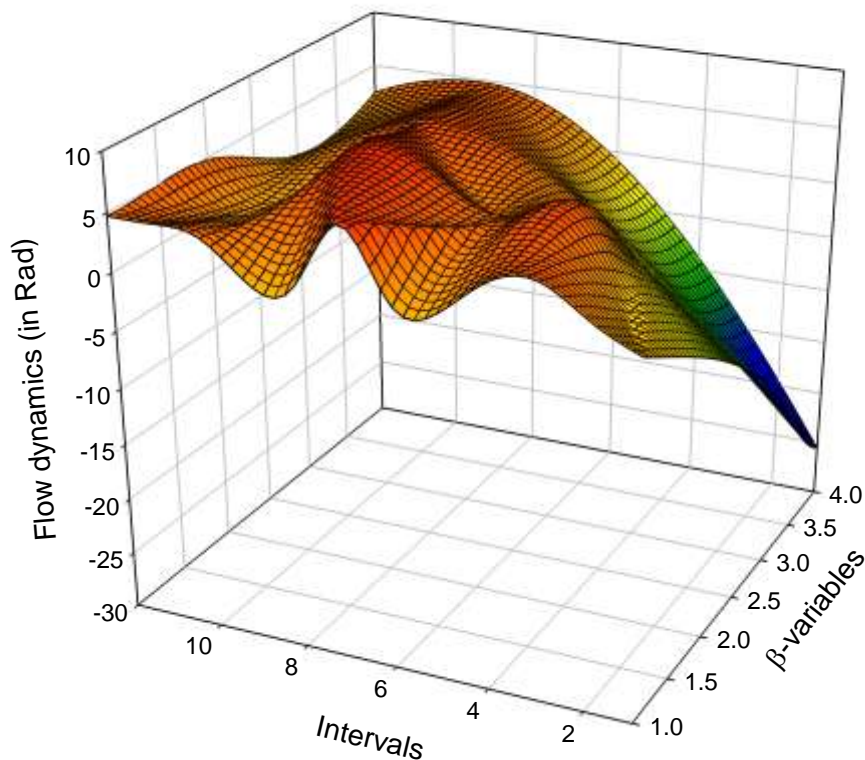
Concerning Tacitus' environmental sensitivity, (*Nec velis*) emerges as the most significant motion in the agent flow, i.e., the Suiones do *not* have *sails* on their boats. In the last paragraph, he notes that *not even (ne)* a freeman is allowed to be in charge of the weapons (it can only be a slave). The importance of the agents for the overall perspective structure can only emerge through the analysis of the folded formation, which is another step in the graphical representation and refers to a landscape based on a Free Energy Surface (see next chapter). Now, let us look into the flow dynamics of the Orientation space, Figure 1.2.

### *The Objective surface*

The first deepness occurs in the first interval, which means that the verb is followed by a dummy variable for the textual objective (*valent*  $\emptyset$  ). The magnitude of the dummy is very close to zero ( $\approx 0.84$ ), which contains the value of the grapheme strings of the verb together with the value of word and sentence marker. However, no root can be extracted, because the flow stops. Next deep is marked with ( $\approx 0.78$ ). It is similarly formed by the verb (*agit*  $\emptyset$  ), which appears in the third interval and likewise is followed by a temporary flow stop. The deepest part of the text carries the magnitude ( $\approx 3.72$ ) and can be observed in the fourth interval due to (*adiungunt*  $\emptyset$  : ). At this place, the articulation has resulted in a rotating and swinging objective. It is composed of both the shaded agent (*nec velis*), which through the dummies is channelled downwards from the fourth to the fifth interval, and of the phrase (*ut in quibusdam fluminum*), whose roots are extracted in reversed order from the fifth to the fourth interval.

In the seventh interval, the highest value shows up, namely ( $\approx 7.15$ ). It refers to the place in the flow where (*est apud illos et opibus honos...*) is starting a new sentence and no roots are modifying the objective value. In the last interval, we have a low value ( $\approx 0.75$ ), which is the end of the text.

## Orientation



**Figure 1.2** *Flow dynamics of the Objective*

It has been indicated through the darker parts of the lot behind the last fold. Further, in the fifth, sixth, eighth, ninth, and twelfth intervals, low values imply some restricted moves. Obviously, the variables of the Objective do not flow evenly. Instead, the flow shows a twisted and knotted shape, which may be said to resemble a clam or snail. The twist in the shape namely is caused by both the twinning and twisting rotations around the verb (*adjungunt*) in the fourth interval and (*solutum*) in the fifth. These verbs refer to the fact that the Suiones do not connect (attach) oars at the sides of the boat, but let them be detached as in some rivers (*ut in quibusdam fluminum*).

*Conclusions:* The usual conception of Tacitus' style has been confirmed by the geometric representation of the short text passage. Furthermore, it has been possible to differentiate between the writer's perspective on the subject and his orientation in the subject by the different but complementary geometric shapes of the Agent and the Objective component. The *Agent* shape shows rapid and explicit writing movements, which seem to be rhetorically controlled; the prelude comes first, thereafter the sensitive motions, governing the flow. The *Objective* gives a picture of a writer who treats his subject in a restrained manner. Is this shape an expression of tacit knowledge? Anyway, there are reasons to call the writer "closed". Finally, its structural significance is addressing the fact that free parameters are pointless in the string-approach (Greene, 1999, p. 383) and means that this approach is not fitted into one or the other empirical context. Hence, for the first time it has been possible to look into the language space of a Latin text and to measure the phenomenon of consciousness in behavioural terms and in an Ancient context.

## **Evolutionary Search for Novelties**

Bernhard Bierschenk

Text of any length implicates wholeness. In a fundamental sense, wholeness signifies validity and requires neither the selection of a particular reliability frame nor any other reference system. All that is required is a biological system that is characterised by a particular style of writing. Therefore, the outcome of a textual performance is always dependent on a unique physical context for its expression. Processing wholeness means processing information specificity. Hence, a lawful textual expression can be processed with respect to its information flow dynamics.

Wholeness has been captured in the concept of holophor. The form ('holo-'), meaning "whole" is addressing a sequence of degradation steps that is carried out, but without any intervening dissociation. Furthermore, conceiving text as an information carrying system, is preserved in the suffix ('-phore'), meaning a thing or part that carries or bears, i.e., a carrier. As a result, the applied Zipper-function (B. Bierschenk 2012), shows that the holophor has empirical value, because it regards the transformation on invariants as named relations, which are the relations between mutually dependent states. A holophor is generated whenever the articulation of one variable (the reference variable) is intersecting a second, carrying a value that leads to the forming of a binary group ( $G^*$ ).

Hence, evolution and holophoric variations must have required novel ways of varying and integrating the basic themes and motifs underlying a textual development. Non-change in a particular segment of an evolving kinematic configuration is a definite demonstration of existing textual constraints. However, it would be difficult to establish a definite connection between operating conceptual processes and the selection of a proper linguistic form, because holophors are organised hierarchically. This means that their formation, as a rule, follows different thermodynamic trajectories. Less stringent criteria for the establishment and naming of topological singularities are required on the kinematic level, since no one-to-one mapping can be expected in any textual transformation.

How differences in a holophoric transformation will constrain the magnitude of individual states will depend on how the folding precedes. The folding makes coupling processes visible and gives its outcome direct physical meaning. However, the developing configurations require a processing technique, which can pick up and communicate the meaning of the involved fusion dynamics. Since the fusion algorithm works time-dependent it is producing the properties, which have to be named. Thus, inherent in the process are growing degrees of complexity, which will be captured by the process of naming. Therefore, it is only natural to refer to a state (T) in the workspace as an expression of the system's nonlinear mode of energy transfer. In this sense, the magnitude of (T) will be taken as an indication of the thermodynamic mode of producing transformations.

### ***Free Energy Surfaces***

Crucial for the processing of the radians in the determination of a shape at the kinematic level are the observations on fused variables. Fusion is the result of repeated transformations. This means that they are determinable through the distant function. Further, it concerns the expression of thermodynamic flow processes, which are generating the structural properties of a landscape. However, with respect to the fusion dynamics ( $z=Rad$ ) and the determination of ( $x=Strain$ ,  $y=Shear$ ), the effects become manifest by means of transformed and interpolated radians. Changes in the fusion dynamics are reflecting the functional relations between straining and shearing.

The extent to which a landscape can give expression to the degree of curvature in a shape can be made evident in Gaussian terms, i.e., the product of curvature in orthogonal directions. Moreover, the interpolation of the radians has been carried out with the negative exponential function. The applied local smoothing technique is using polynomial regression and weights, computed from the Gaussian density function.

Accepting the governing time dimension means accepting a proper time scale for the transformation processes, which bring together the strings, make up point attractors, and conserve them in certain composites as state attractors (T). The aim with a landscape is to embed the local and global attractors of the Intention and Orientation spaces. The applied program is SigmaPlot (version 11, 2008). The resulting landscape is low dimensional, which means that it builds on a small number of order parameters. The actual order parameters include two stress functions, namely a strain-function, and a shear-function, while the fusion-function is reflecting the total amount of free energy.

If a counting of the nodes is regarded as expression of topological distance, then distance becomes visible as length of a trajectory, which has empirical implications. The size of the underlying mesh can be determined based on the following formula:

$$\text{Required States} = [4 \otimes T_n] - 4 = (\text{Propagating Cells} - 1)$$

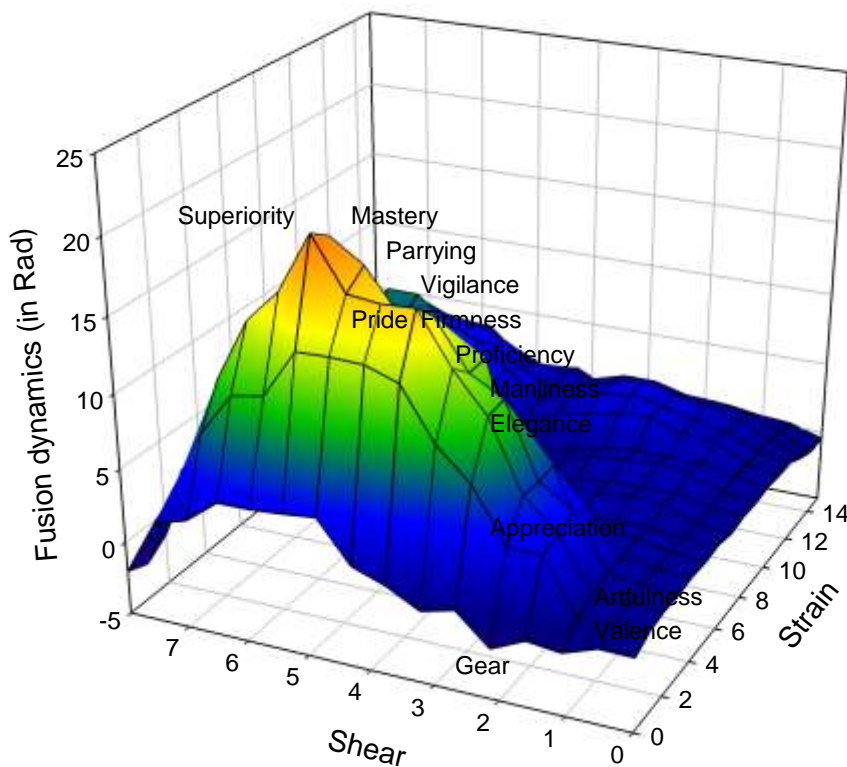
The representation of one singularity (=state attractor) in a topological space requires four coordinates. The number of singularities ( $T_n$ ) is one less the number of point attractors ( $p_n$ ), which are the variables on the x-axis. As to the establishment of the needed states in the evolving mesh, subtraction ( $-T_n$ ) relates the number of degrees of freedom. By averaging over all other degrees of freedom, a holotopic system is generated that is invariant over languages. It is also worth noting that the states at the boundaries of the system represent the point attractors ( $p_i$ ) as well as a new kind of Dummy ( $D_i$ ). Every point attractor or Dummy is acting on the transformations that are taking place in a topological space description.

If the changes that are instantiated by the point attractors are small, they will produce a *homorhetic* path. However, any time the transition from one state to the next following is producing a sudden and unexpected or exceptional jump, this is resulting in a *hysteresis*, and a new path comes into existence. Further, any application of a minimally sufficient mesh will have the capacity to catch and manifest a number of qualitatively distinct phases. After the mesh has been established, the processes involved have to be explained and discussed with reference to the impact of rotation dynamics.

### *Impact of Rotation Dynamics*

The landscape of Figure 2.1 has to be read from the right, which means that the representation of the developing configuration is shown reversed. With growing complexity, the course of fusion is generating increasing distances. The folds in the landscape are resulting from uniqueness in the process of comprehending the pattern of ideas. Fundamental to this process is the provision that orientation can be taken into account and evaluated in relation to the complexity of the emerging folds. However, relative to some line of reference, the significance in the inclination of a fold is increasing with time. Thus, a stepwise transformation is simultaneously generating a path that is climbing a specific peak. A singularity (point or state attractor) exists independent of the kind or degree of deformation of the curve. Differences in the coordination of relational changes constitute escapements, which are forming the path. Thus, understanding the time-dependent development of a path, means understanding how phase-dependent linkage relations become established.

## Orientation



**Figure 2.1** *The Landscape of the Objective Component*

In focusing on the specification of the paths in the Orientation graph, where the variables or point attractors ( $p_1, p_2, p_3, p_4, \dots, p_n$ ) have been attracted by the state attractors ( $T_1, T_2, T_3, \dots, T_n$ ), space and time can be formalised on the basis of a developing path. However, unless it becomes clear that an evolving landscape depends on the knowledge of the total amount of expended energy, information on the way in which the magnitudes of ( $p_n$ ) and ( $T_n$ ) are integrated will not be sufficient for an understanding of the distance between the state attractors. It helps to define the local minima and maxima, which actually separate evolving attractor states. Thus, the transition through a landscape is strictly controlled by the underlying attractor relations.

Being able to discover the absolute termini (limits) and structural relations appears to provide the key to an evolutionary search for novelties in a complex landscape. Since the integration process exists only over time it is not only generating the termini but it is also correcting itself. By transiting through the terminal states, it is demonstrable that the straining by a point attractor, characterising one state, will change its relations because of the straining by another point attractor in another state. For this process to become comprehensible, it is worthwhile to begin with the first sequence of graphemes on the Objective component and to follow up the procedure of generating a terminus. To get some feeling for the way in which the procedure works, the result is given in Table 2.1.

**Table 2.1***Transformation of  $\beta_1$  to  $T_1$* 

<i>Node</i>	<i>Value</i>	<i>Transformation</i>	<i>Translation</i>
D	0		
$\beta_1$	0.8478	valent (Y)	is valid (Y)
$T_1$	<b>0.8478</b>	<i>Valens</i>	<i>Valence</i>

The illustrated variable connects to a sequence of graphemes on the string ( $\beta_1$ ). According to the underlying mesh representation, a curved line from the variable to the state attractor ( $T_1$ ) indicates that this string of graphemes should be transformed to something else, which however no longer has any physical existence.

In applying this technical operation the derived name of this binary group ( $G^*$ ) is, *Valence*, which appears as state attractor in the forefront and right-hand side of Figure 2.1. Thereby the active point attractor at the border puts emphasis on the validity of prospected events or possibly dangerous situations.

At the beginning, all fractions within a particular period must contain closed sets. Since the first variable is an individual variable, it has to be wrapped by a zero value. It follows that the dummy (D) in Table 2.1 indicates a phase dependent transition, which can be detected with the point of departure in the *binary operator function* suggested by Connes (1994). This function requires the binary group ( $G^*$ ) which leads to remarkably simple measurements. Thus, a transformation on the  $\beta$ -strand begins with binding its grapheme strings to the respective point attractor (i.e., the edge value ( $T_1$ ) of Fig. 2.1). This is the first step in the process.

From these measures, evolutionary growth curves begin to form themselves. Thereby, the applied fusion algorithm is producing a line of growth, which is self-indicative. A line of growth reflects discontinuities and represents a lasting record of successive stages. As noted, time-dependent fusion processes are involved in the determination of critical break points. Moreover, in crystallising information, the taken path specifies the nature of the fusion dynamics. What is invariant in a crystallisation process that is undergoing the change can be reflected and named. Thus, when termini describe a path, the limits mark the transition where analytical concepts are transformed into synthetic relations. When the process enters into the next  $G^*$ , its transformation is shown in Table 2.2.

**Table 2.2***Transformation of  $\beta_2$  to  $T_2$* 

<i>Node</i>	<i>Value</i>	<i>Transformation</i>	<i>Translation</i>
D	0		
$\beta_2$	2.823445	quod utrimque prora paratam semper appulsui frontem	that at both sides stem prepared always landing the front
$T_2$	2.823445	<i>Artificium</i>	<i>Artfulness</i>

Compared to the previous process, it is alike since it must take into account a second dummy, which also is connected to the second state attractor. It connects with variable ( $\beta_2$ ). If the strings of variable ( $\beta_2$ ) shall have some influence, again, they must result in something transformed (i.e., something new). The preliminary result of this transformation is settling on *Artfulness*, which appears to be the best approximation since it is addressing the dexterity in combining technology with the art of the useful, and power with the beauty of design. Of course any alternative description will do, which can catch the strength of this transformative

step. In any case, the result is virtual, which means that it has no longer any direct correspondence with the physical, i.e., textual context.

A transformation over the established state attractors requires a backward connection, i.e. from ( $T_2$ ) to ( $T_1$ ). The process is interval-dependent and an inbuilt and dynamic correction mechanism guarantees that the selected expressions are not too far away from a suitable terminus. Otherwise, the process will not produce a conclusive terminus and the implied ring relation will not form properly. The entire process is shown in Table 2.3.

**Table 2.3**

*Transformation of  $T_1$  through  $T_2$  to  $T_3$*

<i>Node</i>	<i>Value</i>	<i>Transformation</i>	<i>Translation</i>
$T_1$	<b>0.8478</b>	<i>Valens</i>	<i>Valence</i>
$T_2$	2.823445	<i>Artificium</i>	<i>Artfulness</i>
$T_3$	<b>3.670945</b>	<b>Appretiationem</b>	<b>Appreciation</b>

The nature of change in Table 2.3 begins to reflect a thematic structure whose terminus indicates the quality of *Appreciation*. Integrated at this stage is a relatively favourable situation conducive to admiration. This is the critical point in the concentration of information, where two orthogonal states become coordinated and formed into a path. Viewed the other way around, it is the critical point where particular aggregations of patterns of strings divide or split.

To repeat, strong bottlenecks in a climbing path imply firmness. As a result, all changes in the transitional complexities observed at the end of this transformation path can be communicated with the novelty of ( $T_3$ ). However, before the configuration properties of the text can be discussed, it may be worthwhile to remember that any particular organisation of state attractors marks a qualitative mode.

Since folds are expressing evolving substructures, manifested substructures give rise to evolutionary fitness. A singularity of an established configuration is thereby characterising the region of a landscape that is manifesting a particular thematic change. Therefore, the state attractors are marking configuration differences. Repeated transformations and crossing of one path with another allow for the integration of the consequences of having found the naming function in the form of structural relations. Because the structure is anchored in the text surface, shifting experiences become evident through the naming function, which is providing the meaning of the involved transformations.

### ***Naming the Orientation Path***

Higher up in the terrain appears *Elegance (Elegantia)*. It clearly supports a causal efficacy and a capacity to produce powerful effects. The term implies sophistication. To be sophisticated means that people grow with growing experience and learn to adapt. The saddle-shaped region in Figure 2.1, indicated with Elegance, is connecting two substructures, namely smartness and modulation, which are not shown here but are easily identified with two independent maxima and minima. They provide for the thematic determination of the curvature of that part of the landscape.

A small step higher up on the mountain is a certain change named with *Manliness (Virtus)*. It is an expression of skill and power and subsumes the qualities that make the man (vir). Since this state of order is assessed through beautiful physical forms, the *Virtue* of bodily form is the ultimate demonstration of good quality, which is promoting magnitude.

The capacity to obtain predetermined results with a minimum of energy investment is marked with *Proficiency (Profectus)*. Here, the terminus means advanced skills in the production of artefacts.



Climbing still higher up brings *Pride (Superbia)* into view. Its positive connotation means that it is a product of praise and directed towards the quality or state of being strong. The terminus in its immediate neighbourhood is *Firmness (Firmitas)*, which means that the path is turning towards resoluteness in purpose and resistance to externally applied pressure.

Further, the ability to maintain attention and alertness over prolonged periods of time is captured with the terminus *Vigilance (Vigilantia)*. Hence, the focus is on protective watching of possible revelry or raid member. Therefore, this attractor state implies that vigilance is required whenever an event contains risks of treachery.

Further up in the mountains is the spatial change locally determined by *Parrying (Propulsatio)*. Basically, this means to prevent a challenger from inside or outside to land an attack. When a physical attack is envisioned to be threatening, parrying is originating from a watchful position. Parrying gives the protector calculated impact on an intensified event and causes an attack to fail physically. This kind of functional control gives expression to the capacity of being highly responsive to changing conditions.

Nearby and higher up is the saddle identified with the final or global terminus *Mastery (Imperium)*, which goes beyond learning and development of skills. In this respect, it means that the life of the Suiones is approached with a pro-active instead of a re-active attitude. In this sense, mastery goes even beyond skilful handling of artefacts. It embraces all aspects of competition and survival under rough and demanding conditions.

Before getting to this critical point, the process had to reach the highest peak on the mountain. Here, the Ancient understanding of *Superiority (Praestantia)* appears as expression of the state of being better than someone else. Hence, ranking physical shape and appealing strength means describing power, dignity, and attractiveness as well as structural design. The term describes and praises strength without harm to others.

Finally, below sea level appears the terminus *Gear (Machinamentum)*. How to get approval and mechanisms to work together for being strong in war-gear provides the platform for a growing control.

### ***Naming the Intention Path***

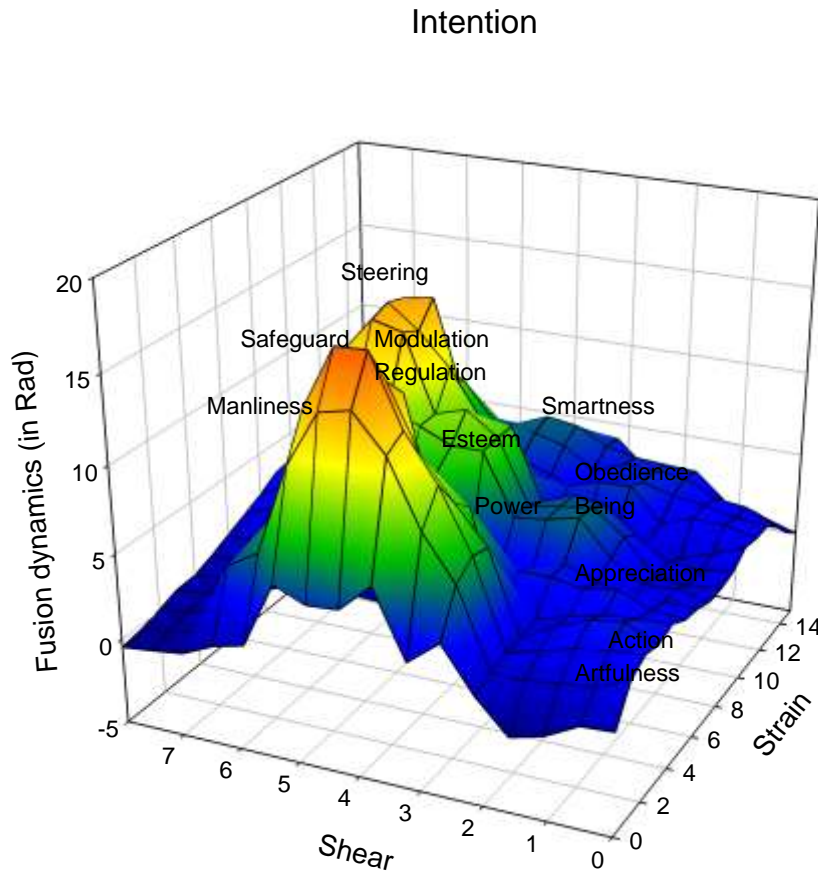
If the naming of the Orientation path has been successful, a further routine can be initiated. This routine concerns the  $\alpha$ -variables of the A-component and requires that a terminus be extracted for the proper description of the state attractors of the landscape of the Intention component as presented below in Figure 2.2. The procedures of Table 2.4 may contain a helpful illustration.

**Table 2.4**

*Extraction of termini from O-component*

<i>A-component</i>	<i>A-component</i>	<i>O-component</i>			<i>Fusion</i>
<i>Pendulum</i>	<i>Destination</i>	<i>Destination</i>	<i>Extract</i>	<i>English</i>	<i>Value</i>
$D \rightarrow \alpha_2$	$T_{A1}$	$T_{O2}$	Artificium	Artfulness	4.4902
$\alpha_3 \rightarrow \alpha_4$	$T_{A2}$	$T_{O4}$	Actio	Action	8.233825
$T_{A2} \rightarrow T_{A1}$	$T_{A3}$	$T_{O3}$	Appretiationem	Appreciation	12.724025

Extraction begins with a search for the starting variable, which is a dummy (D). Following the path to  $(\alpha_2)$  leads to the state attractor ( $T_{A1}$ ). In order to find the corresponding path in the Orientation space, the routine is switching to  $(\beta_2)$  and is following the path to (D). Immediately before the (D) appears the terminus of ( $T_{O2}$ ), which is the aspired point of destination, whose name is *Artfulness (Artificium)*. Thus, ( $T_{A1}$ ) gets Artfulness as its descriptor. Artful preparation and training, is indicated at the right-hand side of Figure 2.2.



**Figure 2.2** *The Landscape of the Agent Component*

In the continued process, a transition from  $(\alpha_3)$  to  $(\alpha_4)$  is guiding the search in the lower part to  $(T_{A2})$ . A switch to the  $(\beta_3)$  initiates a swing to  $(\beta_4)$  which implies that the destination is found at  $(T_{O4})$ . Hence, in this position the proper name for  $(T_{A2})$  can be extracted. Extracting its terminus *Action* (*Actio*) means that its descriptor signals one's willingness to act.

In continuing the transition from  $(T_{A2})$  to  $(T_{A1})$ , the search guides the process towards  $(T_{A3})$ . In switching to the Orientation space, the search is following the corresponding path from  $(T_{O2})$  to  $(T_{O1})$ . This is a very short swing, which is resulting in the extraction of *Appreciation* (*Appretiationem*) at  $(T_{O3})$ . Hence, *Appreciation* is the proper descriptor of  $(T_{A3})$ . There are many ways an observer may understand people and their environment. It implies abilities and dispositions with respect to the observed and the capacity to report on the conditions of behaviour.

Now, higher up in the mountain appears a saddle. Its seat is marked by two descriptors, namely *Power* (*Potentia*) on one hand and *Being* (*Essentia*) on the other. The terminus *Being* is referring to innateness as well as to existence. In the neighbourhood of *Power*, the common meaning of the descriptor relates to a certain reality. Thus, *Power* gives the state of being, an expression and manifestation of one's individual character.

In the background becomes *Obedience* (*Obedientia*) visible. Thereby powerful individuals are expected to respect authority and actions are taken in advance with the purpose of protecting authority against possible danger. The other descriptor in the background indicates the quality of *Smartness* (*Sollertia*) which reflects a relatively favourable condition conducive to success.

Especially with reference to the descriptor *Esteem (Dignatio)*, it underlines one's sovereignty in determining good results. It concerns the condition of people who can exercise self-determination. Thus, exercised appreciation takes a lead in avoiding anxiety causing events.

Considerations for the future are ingredients, which are subsumed under the descriptor *Regulation (Moderatio)*. It implies that measures have to be taken in advance to avert possible evil. This means prudent foresight and instructions in order to put people on guard. The path finalising at the left-hand side of the mountain implies forethought as well as thinking out or planning.

Relating to the descriptor *Manliness (Virtus)* means relating to a personal characteristic, which promotes collective and individual prominence. In the Agent's perspective, this means the state of moral excellence. In following the path to the top of the mountain the final attractor state appears in the descriptor *Safeguard (Praecautio)*, which concerns survival conditions and original terrain properties for advancing one's capacity to keep one's autonomy.

The top of the mountain in the background is characterised with the descriptor *Steering (Gubernatio)*. In a fundamental sense, it means a genuine ability to cope with fate and to overcome difficulties. Taking into account the descriptor *Modulation (Modulor)* means an efficient accentuation of performance capacity.

Since the extraction of a descriptor is the result of a transformation process, it incorporates both the state as well as the dependency relation between descriptors. A detailed explanation of the transformational steps involved in a sequence of attractors allows for a thoroughly controlled naming process. Further, the terminologically controlled state-changes are leading to the "correct" communication of theoretically significant information invariants.

Catching the naming process within a landscape is the morphogenetic way of giving expression to the conditions, which determine size and growth in the naming process. In recognising evolving dependency relations, it is demonstrated that a configuration of names always ends up with a final (inclusive) name. At the kinematic level, a discussion of the transformation processes becomes meaningful first through an approach that describes the relationship among various parts of a configuration. The resulting dependency relations between certain microstructures maintain their coherence within the space context.

*Conclusions:* The limiting effects on the established attractors are related to tacitness, which resulted in twisted and knotted shapes in the unfolded states of Agent and Objective. These have been shown to look like *a clam or snail*. Folding of these spaces has produced two global state attractors. Their final and inclusive names are: **(A) Safeguard** and **(O) Mastery**. The path of (A) has produced **Safeguard** as basis for the evolution of social self-organisation, which has governed the generic processes of the Suiones-society. It is a fundamental property for the determinative conditions, which have influenced the boundary conditions. The produced path of (O) has generated **Mastery**. From the global point of view, mastery of behavioural and environmental control is an achievement, which is intimately related to utility. The capacity to reflect flexible changes according to intention and contextual demands requires a radical perspectivation of survival conditions. At the societal level, selective movements generate and guarantee properties that are critical for multiple functionality and stability in growth.

## Epilogue

Bernhard Bierschenk

One of the most original thinkers in historical time is Tacitus. With some uncertainty, his Christian name has been reported to be Publius or Gaius. More certain is his surname Cornelius. Especially certain is his byname Tacitus. Interestingly, the byname characterizes him with respect to his mode of expression. The conciseness in his writing of Germania is sophisticated and penetrating. Since the text appears to be simple and easy to appreciate, it has been a source for attempts to reveal its implicitness. He has also been named Rome's most salient or thoughtful thinker and monumental breaker of new ground.

In a historical perspective, devotion and sternness can be tested with respect to the path taken. However, finding a solution (test) is dependent on the processing of the relations between mental abilities and transcending behaviour. Thus, the proof of its dramatic force is in the processing itself (Mackenzie, 1998). The premise is that the information in the textual medium is sufficient to account for what remains invariant over change.

Conceived in the perspective of Functional Text Geometry, achieved rotations will make manifest that irreversible processes appear as instabilities at the kinetic level and as stabilities at the kinematic level. In particular, Energy Landscapes (EL), obtained from dynamic and thermodynamic properties, allow a global view on the produced performance. EL includes both Potential Energy Surfaces (PES) as well as Free Energy Surfaces (FES). At the PES level, rings operate on semantic-free graphemes and grapheme strings. Independent of a particular language, writing must reflect the intertwined functions of PES and FES. Since the generation of a configuration of string composites presupposes stability in the folds of FES, it provides the key to the manifestation of adaptive structures. Symmetries, because of non-commutative measurements, are thereby tied to processes of conservation. To reiterate, transformation depends on the constraining effects of the controlling states at the borders of FES.

Now, Koehler (2011) asked, "Where is the flow?" This question has been answered through the presentation of PES. Based on real time imaging of grapheme movements it has been made evident that an AaO-molecule, containing an A-particle and an O-particle, is biologically rooted and depend on a rotating mechanism (B. Bierschenk, 2002). Further, living systems seem to have established rotational movement mechanisms for synthesising important life processes (Hernández, Kay, & Leigh, 2004). The Potential Energy Surfaces concerning the Latin text have been reported and discussed by I. Bierschenk. In the Figures 1.1 and 1.2, it was shown that morphogenetic properties are governing and gating continuous and discontinuous displacement processes, which lead to the generation of time-dependent trajectories.

Based on AaO-molecules, expressed as AaO-rings, this means at the kinetic level that graphemes must be regarded as the result of a microscopic synthesis (B. Bierschenk, 2011). The AaO-ring is an important bridge between spinning strings and the rotation mechanisms at the biological level. However, without the determination of a proper time-scale for biologically important kinetic and kinematic processes, it is impossible to identify the causal links to the responsible biological mechanisms. Performances that are more complex have been discussed in connection with the production of FES.

The appearance of a terminus describing a state attractor must be treated as an emergent novelty. In using the rhythmic, clock-like working mode of the AaO system as well as the mirror strategy, componential disparity has produced two global state attractors. This result will be discussed based on the overall hypothesis:

*Multiply stable states are organising themselves into several different state attractors through which the invariants of intention and orientation can emerge and give expression to the tacitness of Tacitus.*

For the discovery of the intentional dynamics in a text, one must be able (1) to make the producer known through the production, and (2) to recover the underlying intention and orientation through attitudinal changes step-wise and, to repeat, *without intervening dissociations and in perfect order* (Baeyer, 1999, pp. 12-14).

#### *Implications of the ( $\alpha+\beta$ )-helix*

From a structural point of view, the informational coherence of (A=Safeguard) and O=Mastery) is the crucial new dimension, which allows the incorporation of intention and orientation into a conclusive expression. The functional relation between Safeguard and Mastery as well as the conditions for the operations of abstraction and extraction involve sensitivity to the informational path. To determine the depth of integration on the path means that their evolution requires a novel way of varying and integrating in order to fit a particular task environment.

When the Latin text is considered as context, the cooperation between intention and orientation is no longer the objective of the physical conditions of making experience. Instead, it is the absolute determination of a language space that comes into focus. Thereby, new constraints are produced, which pass beyond the descriptive limits of a text surface. Because of transcending physical surface constraints, abstract spaces are evolving, which have hyperbolic property.

In retrospect, it can be stated that the invariants of the established concentration spaces has emerged through an evolutionary search for themes and motifs in complex energy landscapes. The search has been based on the following assumptions:

- (1) Natural law, governing the development of intention, needs to be recognised at the individual level.
- (2) Natural law together with selected materials is furnishing adaptation to complex systems.
- (3) Non-linear dynamics is producing the complexity of the deeply ingrained commonality of the developing growth curves of intention and orientation.
- (4) The singularities of a growth curve exist independent of the kind or degree of deformation of the curve. This defines topologically the existence of invariants.

#### *Morphogenesis*

Since the performed transformations are invariant over particular systems, the nature of the morphogenesis (or growth) is manifesting the way in which information, carried by the point attractors, becomes transformed and conserved or stored in changing naming paths. Variations in shading are of fundamental import for morphogenesis and the evolutionary development of structure. Small textual elements appear, disappear, or are moving from place to place according to the laws of nature. Hence, transpositions are producing complex viscous-elastic events and are implying that the style in the production of a text must be fluid and dynamic. Sensitivity to shadings in reading literary texts plays an obvious role for the comprehension of some thoughts and courses of events in history. The basic structure of the Latin text suggests a cumulative progress, e.g., increasing morphological complexity in the resulting discourse. In becoming familiar with the adaptive changes in the emerging shapes, the importance of differences in the folds of a landscape has made relative fitness approachable. However, it has become equally evident that fitness cannot be measured based on evolutionary success.

When evolutionary trends constitute the context for the manifestation of structural relations underlying a landscape, trends appear to be dissimilar partly in the dynamics, partly in the forming of novel state attractors. However, the most characteristic property of the emerging growth curve of the Motif is that it is losing its direct equivalence due to the higher degree of abstractness compared to the growth curve of the Theme. A particular growth curve may shift toward a phase where the boundaries of the evolving curve are defined anew. Naming the global state attractors means naming the deep structural relations at work. In conclusion, the comprehension of the Latin text has produced certain symmetries between its motifs and themes.

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