AN INFORMATIONAL APPROACH OF BEING-THERE AS UNDERSTANDING I*

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This essay is a study of possibilities pertaining to philosophical text formalization; it is a trial formalizing the most complicated and semantically interweaved concepts of Heidegger's Being-there as understanding. »What kind of formal informational system understanding in the context of Being-there could be?« is another, yet unanswered question. However, this essay is a beginning in formalizing the question of understanding in the context of Being (Dasein, Being-in, Being-in-the-world, Being-possible, Being-there, disclosure, existing, explaining, knowing, seeing, etc.). It is an approach towards the so-called informational understanding machine through the arising formalism (informational language).

The first part of the essay deals with introductory commentaries concerning the way of author's motivation to undertake such particular seeing of the problem. In the next section of the essay a formal informational interpretation of Being-there as understanding is presented in both Heidegger's and informationally formal way, in projecting and constructing formula systems which pertain to the original philosophical sentences. In this manner, in this part of the essay, fifteen paragraphs of Section 31 of Heidegger's *Being and Time* are interpreted in the informationally formal way. Several subscripted Greek and Fraktur letter operand and special operator symbols are introduced to make formulas readable and symbolically distinguishable.

In the continuation of the essay four further paragraphs of Heidegger's text will be formalized and an integrative formal interpretation of the examined paragraphs will be given. Two dictionaries of formal symbols together with explanation in English, German, and Slovene will be attached.

Informacijski pristop k biti-tu kot razumevanju I*

Ta spis je raziskava možnosti, ki se tičejo formalizacije filozofskih besedil; je poskus formaliziranja najbolj zapletenih in semantično prepletenih konceptov Heideggrove biti-tu kot razumevanja. Drugo, doslej neodgovorjeno vprašanje je, »Kaj je lahko razumevanje kot način formalnega informacijskega sistema v kontekstu biti (tubiti, biti-v, biti-v-svetu, biti-mogoče, biti-tu, razprtja, eksistiranja, pojasnjevanja, védenja, videnja in temu podobnega). Gre za poskus približevanja t.i. informacijskemu stroju razumevanja z uporabo nastajajočega formalizma (informacijskega jezika).

V prvem delu spisa najdemo uvodne komentarje, ki zadevajo napotovanje avtorjeve motivacije v táko posebno gledanje na problem. V naslednjem poglavju spisa je predstavljena formalna informacijska interpretacija biti-tu kot razumevanja, in sicer v Heideggrovi in informacijsko formalni obliki, v projektiranju in konstruiranju formulskih sistemov, ki zadevajo izvirne filozofske stavke. Táko je v tem delu spisa interpretiranih petnajst odstavkov 31. poglavja Heideggrovega dela *Bit in čas* v informacijsko formalni obliki. Vpeljani so različni operandni in operatorski simboli v obliki indeksiranih grških in gotskih črk, ki zagotavljajo bralnost in simbolno razločljivost formul.

V nadaljevanju spisa bodo formalizirani še štirje odstavki Heideggrovega besedila, dana pa bo tudi integralna formalna interpretacija obravnavanih odstavkov. Dva slovarja formalnih simbolov s pojasnili v angleščini, nemščini in slovenščini bosta dodana na koncu.

One can see in Heidegger's concern for humble things a continuation of his interest in the heritage of marginal practices. He now sees them as possibilities that have saving power precisely because they have never been taken seriously by the metaphysical tradition. Such practices, which have not been singled out as important and so technologized, provide a basis for resisting the technological understanding of being.

— Hubert L. Dreyfus and
Jane Rubin [BIW] 338-339

This essay is a preliminary study of the possibilities of a philosophical text formalization. It pertains to the phenomena of understanding within the framework of philosophy of Being or, precisely, within the Heidegger's Being-there [SZ, § 31]. As a first approximation of informational investigation, formulas corresponding to sentences of the Heideggerian text can be joined in a perplexed way, decomposed and composed, universalized and again particularized. In this mode the concept of Being-there as understanding can be depicted and developed formally obtaining some particular conceptualizations for possible later construction, design, and technology of an understanding system, that is, informational machine. So to say, we are stepping into the realm to make philosophical sentences informational in a symbolic (mathematical) way. One of the basic questions remains, does the possibility of an informational machine for philosophizing in accord to Being-there as understanding (and vice versa) already exist and what would the necessary approach to come closer to the realization of such concept be at all? The carefully reader will possibly find hints, kinks, and his own disclosedness of the problem of understanding within the philosophy of Being in general and within the Being-there in particular. Informational formalization of philosophy in question will certainly brighten the domain of understanding.

1. INTRODUCTION

To get a right approach to understanding it is essential at the outset not to think of understanding as a cognitive phenomenon. ... For Heidegger primordial understanding is know-how. ... understanding a hammer at its most primordial means knowing how to hammer.

— Hubert L. Dreyfus [BIW] 184

The phenomenality of understanding belongs to the main stream of the postmodernistic philosophic, scientific, and technological movement. Irrespective of the philosophic doubt to disclose ever the phenomenality of understanding and make it a scientific and technological tool, the study of intelligence in living organisms remains the most disturbing and irritating view of the future research. The phenomenality of understanding opens a sufficiently broad and unexplored realm of cognition, intelligence, reason, and mind.

The question we put into consideration is, how do philosophers comprehend the phenomena of understanding and which concepts (knowledge, beliefs, world views, rarely notions) do they use in the disputes concerning understanding, interpretation, explanation, and so forth. In this sense, our challenge is to examine some parts of the concerned philosophic disputes in an informational way. In experiments like these, we can study, luckily, some paragraphs of the text written by Martin Heidegger, who, as it seems, has determined understanding not only in the most lucid and complex way till now, but, maybe unconsciously, also in an appropriate informational way. Our attempt will be to prove this assertion in a consequent and formal way.

The basic question of the present investigation will be how does the system of understanding, which Heidegger harnessed together in the realm of the philosophy of Being and time, inform as an informational entity, that is, as a literary symbolic, operand-operator, open informational system. This investigation can offer several hints for the top-down (or, according to K. Popper, from the view of the third world) cognition and construction of comprehensive, intelligent, and understanding systems. To remind the reader, Popper [OK] says that the word *world* or *universe* must not be comprehended too seriously and, in this manner, three worlds or universes can be distinguished: (1) the world of physical objects or states; (2) the world of conscious or mental states, or maybe of ability to act; and (3) the world of objective contents of thought, especially scientific and poetic thought and art works (acts). In the third world there are,

for instance, theoretical systems, problems and problem situations, critical arguments, states of discourse and, certainly, the contents of newspapers, books, and libraries.

When I began to write my first essay on informational phenomenality, in spring 1987 [OWI], I was silently hopping that one day I will be able to put the Heideggerian Being-there (Dasein) as understanding [SZ, §31] into a form of the arising formal interpretation. Now, as this possibility dawned, my task is to prove the potentiality and appropriateness of the so-called formal informational language. A formalistic effort concerning understanding was already invested in the essay *Understanding as Information II* [UAI2], where some Heideggerian views of the loseableness and loosing of understanding have been shown by means of a formal system of informational formulas.

In this essay I will use the technique of formal informational interpretation of sentences belonging to the Heideggerian text. Each paragraph of the chosen text [BT, §31] will be interpreted by a kernel (in some way background) informational system of formulas as an informationally arising entity. Around such a system additional formulas will occur detailing (and perplexing) the interpretation of the system. If a sentence will not be taken into the interpretative consideration (parenthetical or informationally suppressed matter), it will be (temporarily) enclosed into brackets. The reader will come into the position to experience how formal informational interpretations can backwardly influence the human understanding of the original text, to enrich it informationally in a potentially understanding sense. This possibility will arise because of the general and imaginatively unbounded nature of informational operator $\models$ representing the entirety of an informational background.

At the end of the essay, the reader will find two dictionaries ordered by the informational symbols (occurring operands and operators), corresponding English terms, and their translation into German and Slovene. Thus, the opportunity will be given to make further comparisons of meaning and understanding of formulas interpreting the text in English, German, and Slovene.

2. A FORMAL INFORMATIONAL INTERPRETATION OF BEING--THERE AS UNDERSTANDING

Rather, modern natural science, modern mathematics, and modern metaphysics sprang from the same root of the mathematical in the wider sense. Because metaphysics, of these three, reaches farthest—to what is, in totality—and because at the same time it also reaches deepest toward the being of what is as such, therefore it is precisely metaphysics which must dig down to the bedrock of its mathematical base and ground.

—Martin Heidegger [WIT] 97-98

2.0. *THE SEGMENTATION AND STUDY OF THE CHOSEN TEXT*

In this chapter we deal with the verbal and symbolic interpretation of the text belonging to section §31 (Being-there as Understanding) in Heidegger's *Sein und Zeit* [SZ, 142-148; BT, 182-188; BV, 162-168]. The text of section §31 [BT] includes 18 paragraphs which will be analyzed and formally developed in a sentence by sentence fashion. We shall number the sentences of each paragraph by bracketed markers [paragraph_number.sentence_number] and to each sentence corresponding formula by parenthesized markers (paragraph_number.sentence_number). The Heideggerian terms of Being will be used consequently as particular informational entities (headwords, passwords); the reader can find an index of German and English expressions (headwords) including short notes in [BT]. On the basis of this index, the reader can study the concepts of particular terms and see how complex the most of them are conceptualized. Each term is an informational system of formulas and terms are mutually perplexed in various informational ways. By these initial comments, we can proceed by the procedure of study and text formalization in a subsequent and systematic way.

2.1. *THE FIRST PARAGRAPH OF §31 [BT]*

[1.1] State-of-mind is *one* of the existential structures in which the Being of the 'there' maintains itself.

The operands are: $\mathfrak{S}_{mind}$ marks state-of-mind; σ_{exist} marks existential structures; $\mathfrak{B}_{there}$ marks the Being-there (the Being of the 'there'). The formal interpretation of the sentence is

$$(1.1) \quad \mathfrak{S}_{mind} \in \sigma_{exist};$$
$$(\mathfrak{B}_{there} \models \sigma_{exist}) \models \mathfrak{B}_{there}$$

The explanation of operators: $\in$ marks the operation *is one of*. The part of the sentence (meaningly unmodified) ... *the Being of the 'there'* [$\mathfrak{B}_{there}$] *maintains itself* ... within the existential structures σ_{exist} is formalized in the second line of (1.1) by the so-called metaphysical (circular) form for operand $\mathfrak{B}_{there}$. $\square$

[1.2] Equiprimordial with it in constituting this Being is *understanding*.

The exact meaning of this sentence is the following: Equiprimordial with state of mind in constituting the Being-there is *understanding*.

The new operand is $\mathfrak{U}$ which marks understanding. The formal interpretation of the sentence is

$$(1.2) \quad (\mathfrak{S}_{mind}, \mathfrak{U} \models_{const} \mathfrak{B}_{there}) \models_{equi\_p}$$

This formula explains the fact that entities $\mathfrak{S}_{mind}$ and $\mathfrak{U}$ constitute (operator $\models_{const}$) entity $\mathfrak{B}_{there}$ in an openly equiprimordial way. To be equiprimordial (gleichursprünglich) means to inform in an equiprimordial way (operator $\models_{equi\_p}$). The comma between two informational operands has the meaning of 'the one and the other operand' (parallelism). $\square$

[1.3] A state-of-mind always has its understanding, even if it merely keeps it suppressed.

The meaning of this sentence is, that a state-of-mind always contains its understanding (in this case $\mathfrak{U}$) and informs this fact in a suppressed manner.

The formal interpretation of the last sentence could be

$$(1.3) \quad (\mathfrak{U} \, \mathsf{C}_{always} \, \mathfrak{S}_{mind}) \models_{supp}$$

Operator C_{always} is a particular time operator and means 'always has' or 'always contains'. The sup-

pressed informing of this containment remains open. $\square$

[1.4] Understanding always has its mood.

If $\mathfrak{M}$ marks the mood, the formula for this sentence is

$$(1.4) \quad \mathfrak{M}(\mathfrak{U}) \, \mathsf{C}_{always} \, \mathfrak{U}$$

No further comment on this formula is necessary. $\square$

[1.5] If we Interpret understanding as a fundamental *existentiale*, this indicates that this phenomenon is conceived as a basic mode of Dasein's *Being*.

Let us expand the meaning of this sentence in the following way. The first part of the sentence says that we interpret (understand) understanding as a fundamental existentiale. And if so, then this indicates that this phenomenon (our understanding of understanding) is conceived (understood) as a basic mode of Dasein's Being. The sentence as a whole is implicative. Certainly, the we in this sentence can have the function of Dasein's Being and need not be treated as a separate operand. Evidently, Dasein's Being, marked by $\mathfrak{B}_{\mathfrak{D}}$ (or, also, Being of Dasein, $\mathfrak{B}(\mathfrak{D})$), is a component of Dasein $\mathfrak{D}$ and there exist the so-called basic modes μ_{basic} of Dasein's Being. Further, a fundamental existentiale ε_{fund} is the coming out or meaning produced by understanding. In whole, there is

$$(1.5) \quad \mathfrak{B}_{\mathfrak{D}} \subset \mathfrak{D}; \; \mu_{basic} \in \mathfrak{B}_{\mathfrak{D}};$$
$$((\mathfrak{B}_{\mathfrak{D}} \models_{int} \mathfrak{U}) \models \varepsilon_{fund}) \Rightarrow (\mu_{basic} \in \mathfrak{B}_{\mathfrak{D}})$$

Operator $\models_{int}$ has the meaning of interpretative informing and operator $\Rightarrow$ marks the informational implication. Formula (1.5) can be refined (informationally completed, supplemented) in several ways. $\square$

[1.6] On the other hand, 'understanding' in the sense of *one* possible kind of cognizing among others (as distinguished, for instance, from 'explaining'), must, like explaining, be Interpreted as an existential derivative of that primary understanding which is one of the constituents of the Being of the "there" in general.

The meaning of the 'on the other hand' is 'in parallel'. Formulas, separated by a semicolon, are

understood always to exist in parallel. Understanding $\mathfrak{U}$ as an entity is only one possible kind of cognizing $\mathfrak{K}_{cogn}$ among other kinds of understanding or there exist always other kinds of understanding. But understanding is interpreted as an existential derivative δ_{exist} of the very primary understanding $\mathfrak{U}_{prim}$ which constitutes (roots in) (operator $\sqsubset$ or $\sqsubset_{const}$ can be chosen) the Being of "there". Thus, Being of "there" itself can be conceived as the producer of this sort of primary understanding. Furthermore, understanding $\mathfrak{U}$ is distinguished (operator $\neq$) from explaining $\mathfrak{E}_{expl}$. Within this view, we can put down the formal system

(1.6) $((\mathfrak{U} \in \mathfrak{K}_{cogn}) \models_{int} \delta_{exist}) \sqsubset \mathfrak{U}_{prim};$
$\mathfrak{B}_{there} \models (\mathfrak{U}_{prim} \sqsubset \mathfrak{B}_{there});$
$\mathfrak{U} \neq \mathfrak{E}_{expl}$

The last system of formulas ends the formalization procedure of the sentences of the first paragraph in chapter §31 [BT]. It is to stress that the listed formulas phenomenalizing the sentences of the first paragraph are in no way complete informational systems and can be supplemented in a developmentally and explanatory open way, so at some later state, they can even informationally exceed the contents of the particular original sentences. □

2.2. THE SECOND PARAGRAPH OF §31 [BT]

[2.1] [We have, after all, already come up against this primordial understanding in our previous investigations, though we did not allow it to be included explicitly in the theme under discussion.]

This sentence is a kind of comment which concerns the previous text. □

[2.2] To say that in existing, Dasein is its "there", is equivalent to saying that the world is "there"; its *Being-there* is Being-in.

We take the following informational interpretation: in informing, Dasein $\mathfrak{D}$ is the there τ_{there} of Dasein $\mathfrak{D}$, marked by $\tau(\mathfrak{D}_{there})$; this is informationally equivalent to the formula that the world $\mathfrak{W}_{world}$ informs as the there τ_{there}. The world's Being-there $\mathfrak{B}_{there}(\mathfrak{W}_{world})$ informs as Being-in $\mathfrak{B}_{in}$. Informing of Dasein can be symbol-

ized explicitly by the Dasein formula system ($\mathfrak{D} \models$; $\models \mathfrak{D}$). Thus,

(2.2) $((\mathfrak{D} \models; \models \mathfrak{D}) \models \tau_{there}(\mathfrak{D}))$
$\Leftrightarrow (\mathfrak{W}_{world} \models \tau_{there});$
$\mathfrak{B}_{there}(\mathfrak{W}_{world}) \models \mathfrak{B}_{in}$

The last formula system is rather generalized than reduced in comparison to the second sentence of the second paragraph of §31 [BT]. □

[2.3] And the later is likewise 'there', as that for the sake of which Dasein is.

The later in the last sentence concerns the Being-in, that is, operand $\mathfrak{B}_{in}$. Further, the 'is likewise' corresponds to an informational operator and, if we take the most general case, $\models$, this operator can always be particularized in an adequate way. The sequence 'for the sake of which' points to a causal situation, that is, implication $\Rightarrow$, and by the 'Dasein is' the existential (in our language, informational) nature of Dasein is stressed, which can be symbolized explicitly by ($\mathfrak{D} \models$; $\models \mathfrak{D}$). The formula for this sentence becomes

(2.3) $(\mathfrak{B}_{in} \models \tau_{there}) \Rightarrow (\mathfrak{D} \models; \models \mathfrak{D})$

This completes the symbolic interpretation of the sentence. □

[2.4] In the "for-the-sake-of-which", existing Being-in-the-world is disclosed as such, and this disclosedness, we have called "understanding".

This sentence represents a definition of understanding which is the disclosedness concerning formula (2.3) as well as formula (2.2). These formulas build up the informational cycle of Dasein in which the there, world, Being-there, and Being-in are constitutive components. The disclosedness of understanding is a kind of informing of Being-in-the-world within this cycle. Let us mark the "for-the-sake-of-which" by φ_{sake}. Thus, the last sentence induces the formal system as a consequence of the previous two sentences, that is,

(2.4) $((\mathfrak{B}_{in\text{-}the\text{-}world} \models_{discl} \mathfrak{U}) \sqsubset \varphi_{sake};$
$\varphi_{sake} \Rightarrow$
$((((\mathfrak{D} \models; \models \mathfrak{D}) \models \tau_{there}(\mathfrak{D})) \Leftrightarrow$
$(\mathfrak{W}_{world} \models \tau_{there}));$
$(\mathfrak{B}_{there}(\mathfrak{W}_{world}) \models \mathfrak{B}_{in});$

$$((\mathfrak{B}_{in} \models \tau_{there}) \Rightarrow (\mathfrak{D} \models; \models \mathfrak{D})))$$

To say that something is disclosed means that something informs (the disclosedness) (operator $\models_{discl}$). A further interweavement of formulas simulating particular sentences will be discussed in a later section. □

[2.5] In the understanding of the "for-the-sake-of-which", the significance which is grounded therein, is disclosed along with it.

This operand marks a joined system of formulas (2.2) and (2.3). Understanding $\mathfrak{U}$ understands φ_{sake}, that is, as $\mathfrak{U}(\varphi_{sake})$. Within this understanding, understanding $\mathfrak{U}$ is informed by the "for-the-sake-of-which" φ_{sake}, that is, $\varphi_{sake} \models \mathfrak{U}$. The significance of understanding is marked by a generalized operand ξ_{sign}. Under these circumstances, there is,

$$(2.5) \qquad (\xi_{sign} \subset \mathfrak{U}(\varphi_{sake})) \models_{discl}$$

This formula includes formulas (2.2) and (2.3) through the operand, marked by φ_{sake}. □

[2.6] The disclosedness of understanding [$\mathfrak{U}$ $\models_{discl}$], as [$\models_{as}$] the disclosedness of the "for-the-sake-of-which" [$\mathfrak{U}(\varphi_{sake}) \models_{discl}$] and of significance [$\xi_{sign}$] equiprimordially, pertains [$\rightarrow_{equi\_p}$] to the entirety of Being-in-the-world [$\mathfrak{B}_{in-the-world}$].

In the last sentence we introduced the bracketed expressions right within the text of the sentence to achieve a direct correspondence between the word notions and symbols. Thus, we put immediately,

$$(2.6) \qquad ((\mathfrak{U} \models_{discl}) \models_{as}$$
$$(\mathfrak{U}(\varphi_{sake} \models_{discl}; \xi_{sign} \models_{discl}))$$
$$\rightarrow_{equi\_p} \mathfrak{B}_{in-the-world} \; \square$$

[2.7] Significance [ξ_{sign}] is that on the basis of which the world [$\mathfrak{W}_{world}$] is disclosed as such.
This sentence yields

$$(2.7) \qquad \mathfrak{W}_{world}(\xi_{sign}) \models_{discl} \mathfrak{W}_{world} \; \square$$

[2.8] To say that the "for-the-sake-of-which" [φ_{sake}] *and* significance [ξ_{sign}] are both disclosed in Dasein [$\varphi_{sake}, \xi_{sign} \subset_{discl} \mathfrak{D}$], means [$\Leftrightarrow$] that

Dasein [$\mathfrak{D}$] is that entity [$\mathfrak{D} \models; \models \mathfrak{D}$] which, as Being-in-the-world [$\mathfrak{B}_{in-the-world}$], is an issue for itself [$\mathfrak{D} \models \mathfrak{D}$].
One can put

$$(2.8) \qquad (\varphi_{sake}, \xi_{sign} \subset_{discl} \mathfrak{D}) \Leftrightarrow$$
$$((\mathfrak{D} \models_{as} \mathfrak{B}_{in-the-world}) \models \mathfrak{D})$$

This formula can be additionally interpreted by the corresponding German sentence: Worumwillen *und* Bedeutsamkeit sind im Dasein erschlossen, besagt: Dasein is Seiendes [$\mathfrak{D} \models; \models \mathfrak{D}$], dem es als In-der-Welt-sein um es selbst geht. □

2.3. *THE THIRD PARAGRAPH OF § 31 [BT]*

[3.1] When we are talking ontically we sometimes use [$\models_{ont,some}$] the expression 'understanding something' [$\mathfrak{U}(\alpha)$] with the significance [meaning μ_{sign}] of 'being able to manage something' [$\models_{able\_man} \alpha$], 'being a match for it' [$\models_{match} \alpha$], 'being competent to do something' [$\models_{comp} \alpha$].
Formula for this sentence is

$$(3.1) \qquad \models_{ont,some}(\mathfrak{U}(\alpha) \models (\mu_{sign}(\models_{able\_man} \alpha),$$
$$\mu_{sign}(\models_{match} \alpha), \mu_{sign}(\models_{comp} \alpha)))$$

This formula is open as the 'we' or an informational entity (operand) is not considered explicitly on the left side of operator $\models_{ont,some}$. □

[3.2] In [C] understanding [$\mathfrak{U}$], as an *existentiale* [ε_{exist}], that which we have such competence over [something, that is, $\models_{comp} \alpha$ or, in the form of a process, $\mathfrak{S}_{known}$] is not [$\models$] a "what" [$\mathfrak{W}_{what}$], but [symbol ';' or, more definite, operator $\models_{but}$] Being [$\mathfrak{B}$] as existing [that is, $\mathfrak{B} \models; \models \mathfrak{B}$ or, explicitly, $\mathfrak{S}_{exist}$].
Evidently, the last part of the sentence is an informational inclusion in regard to the first part. So,

$$(3.2) \qquad (\mathfrak{W}_{what} \not\models_{comp} \alpha; \mathfrak{B} \models_{as} (\mathfrak{B} \models; \models \mathfrak{B})) \subset$$
$$(\mathfrak{U} \models_{as} \varepsilon_{exist})$$

Another interpretation of this sentence could be, for instance,

$$(3.2') \qquad (((\varepsilon_{exist} \models \mathfrak{S}_{known}) \subset \mathfrak{U}) \not\models \mathfrak{W}_{what})$$
$$\models_{but} (\mathfrak{B} \models_{as} \mathfrak{S}_{exist})$$

To these formulas a different formula can be constructed from the sentence in German: Das im Verstehen als Existenzial Gekonnte [$\mathfrak{G}_{known}$] ist kein Was, sondern [$\models_{but}$] das Sein als Existieren. For this sentence the following formula could be, in principle, adequate:

$$(3.2'') \quad ((\varepsilon_{exist} \subset (\mathfrak{U} \models_{as} \mathfrak{G}_{known})) \not\models \mathfrak{W}_{what})$$
$$\models_{but} (\mathfrak{B} \models_{as} (\mathfrak{B} \models; \models \mathfrak{B}))$$

The most straightforward formalizing approach of the German sentence would be

$$(3.2^3) \quad (\mathfrak{G}_{known} \models_{as} \varepsilon_{exist}) \subset \mathfrak{U};$$
$$\mathfrak{G}_{known} \not\models \mathfrak{W}_{what};$$
$$\mathfrak{G}_{known} \models (\mathfrak{B} \models_{as} \mathfrak{G}_{exist})$$

These examples show the difficulties which may occur at the translation of sentences from one language into another or, speaking informationally, differences which may originate at or depend on the place of observation. □

[3.3] The kind [$\mathfrak{K}$] of Being [$\mathfrak{B}$] which Dasein [$\mathfrak{D}$] has [$\subset$], as potentiality-for-Being [$\models_{as} \pi_{for\text{-}Being}$], lies existentially in [$\subset_{exist}$] understanding [$\mathfrak{U}$].

Formula of this sentence is

$$(3.3) \quad ((\mathfrak{K}(\mathfrak{B}) \subset \mathfrak{D}) \models_{as} \pi_{for\text{-}Being}) \subset_{exist} \mathfrak{U}$$

The German sentence is: Im Verstehen liegt existenzial die Seinsart des Daseins als Sein-können. This sentence delivers, for instance, the formula

$$(3.3') \quad (\mathfrak{K}_{Being}(\mathfrak{D}) \models_{as} \pi_{for\text{-}Being}) \subset_{exist} \mathfrak{U}$$

where 'die Seinsart des Daseins' is marked by $\mathfrak{K}_{Being}(\mathfrak{D})$. As we see, the English translation 'the kind of being which Dasein has' gives a different symbolic expression. □

[3.4] Dasein [$\mathfrak{D}$] is not something present-at-hand [$\not\models \alpha_{present\text{-}at\text{-}hand}$] which possesses its competence [$\subset_{comp}$] for something [α] by way of an extra [$\models_{extra}$]; it [$\mathfrak{D}$] is primarily [$\models_{prim}$] Being-possible [$\mathfrak{B}_{possible}$].

This sentence is a system of two formulas:

$$(3.4) \quad (\alpha \subset_{comp} (\mathfrak{D} \not\models \alpha_{present\text{-}at\text{-}hand})) \models_{extra};$$

$$(\mathfrak{D} \models_{prim} \mathfrak{B}_{possible}) \quad \square$$

[3.5] Dasein [$\mathfrak{D}$] is in every case what it can be [$\mathfrak{D} \models; \models \mathfrak{D}$], and in the way in which it is [$\models$] its possibility [π].

When we say that something is in every case what it can be, we use a kind of determination, for instance, the defining equivalence [$\Leftrightarrow_{Df}$] or simply the sign of informing [$\models$]. So, let it be

$$(3.5) \quad (\mathfrak{D} \models (\mathfrak{D} \models; \models \mathfrak{D})) \models \pi(\mathfrak{D})$$

or

$$(3.5') \quad (\mathfrak{D} \Leftrightarrow_{Df} (\mathfrak{D} \models; \models \mathfrak{D})) \models \pi(\mathfrak{D}) \quad \square$$

[3.6] The Being-possible [$\mathfrak{B}_{possible}$] which is essential for [$\models_{essen\_for}$] Dasein [$\mathfrak{D}$], pertains [$\models_{pertains}$] to the ways of its solicitude [$\pi_{solicitude}(\mathfrak{D})$] for Others [$\omega$] and of its [$\mathfrak{D}$] concern [$\models_{concern}$] with the 'world' [$\mathfrak{W}_{world}$], as we have characterized [$=|_{char}$] them; and in all these, and always [$\subset_{always}$], it pertains to Dasein's potentiality-for-Being [$\pi_{for\text{-}Being}(\mathfrak{D})$] towards itself, for the sake of itself.

Let us write down the formal approximation of the last sentence as the following:

$$(3.6) \quad ((\mathfrak{D} \models_{pertain} \pi_{for\text{-}Being}) \models_{pertain} \mathfrak{D}) \subset_{always}$$
$$((\mathfrak{B}_{possible} \models_{essen\_for} \mathfrak{D}) \models_{pertain}$$
$$(((\pi_{solicitude}(\mathfrak{D}) \models_{for} \omega);$$
$$(\pi(\mathfrak{D}) \models_{concern} \mathfrak{W}_{world})) =|_{char}))$$

The corresponding German sentence can deliver another illumination of the sentence understanding. It is: Das wesenhafte Möglich-sein des Daseins betrifft die charakterisierten Weisen des Besorgens der »Welt«, der Fürsorge für die anderen und im all dem und immer schon das Seinkönnen zu ihm selbst, umwillen seiner. Here, the explaining from the end of the sentence confirms to major extent the sense of formula (3.6).

The problem of translation from one to another language (English, German, informational) becomes also evident on the formal (or informational) level. □

[3.7] The Being-possible [$\mathfrak{B}_{possible}$] which Dasein [$\mathfrak{D}$] is existentially in every case [$\models_{exist}$], is to be sharply distinguished [$\neq_{sharply}$] both from empty

logical possibility [$\pi_{log} \models_{empty}$] and from the contingency [Υ_{cont}] of something present-at-hand [$\alpha_{present-at-hand}$], so far as [$\Leftarrow_{so-far-as}$] with the present-at-hand this or that can 'come to pass' [$\alpha \models \alpha_{present-at-hand}$].

Accordingly to this sentence one can put

(3.7) $(((\mathfrak{D} \subset \mathfrak{B}_{possible}) \models_{exist}) \neq_{sharply}$
$((\pi_{log} \models_{empty}), \Upsilon_{cont}(\alpha_{present-at-hand})))$
$\Leftarrow_{so-far-as} (\alpha \models \alpha_{present-at-hand})$

This formula is an informational implication of the type 'so-far-as'. Considering the original German sentence which in its first part says Das Möglichsein, das je das Dasein existenzial ist, ..., could deliver ($\mathfrak{B}_{possible} \models_{exist} \mathfrak{D}$) instead of (($\mathfrak{D} \subset \mathfrak{B}_{possible}) \models_{exist}$) in formula (3.7). □

[3.8] As [$=|_{as}$] a modal category [Υ_{modal}] of presence-at-hand [$\pi_{at-hand}$], possibility [π] signifies [$\models_{sign}$] what [α] is *not yet* actual [$\not\models_{act}$] and what is *not at any time* necessary [$\not\models \nu_{at\_any\_time}$].

The informational formula for this sentence can be the following:

(3.8) $(\Upsilon_{modal}(\pi_{at-hand})) =|_{as}$
$(\pi \models_{sign} ((\alpha \not\models_{act}),$
$(\alpha \not\models \nu_{at\_any\_time})))$ □

[3.9] It [π] characterizes [$\models_{char}$] the *merely* possible [α_{merely_poss}].
In short, there is,

(3.9) $\pi \models_{char} \alpha_{merely\_poss}$ □

[3.10] Ontologically [$\models_{ont}$] it [π] is on a lower level [λ_{lower}] than [$\models_{than}$] actuality [α_{act}] and necessity [ν].

A direct translation of this sentence into informational language is

(3.10) $(\pi \models_{ont} \lambda_{lower}) \models_{than} (\alpha_{act}, \nu)$ □

[3.11] On the other hand [$\|\models$], possibility [π] as an *existentiale* [ε_{exist}] is the most primordial and ultimate positive way [υ_{way}] in which Dasein [$\mathfrak{D}$] is characterized [$\models_{char}$] ontologically [$\models_{ont}$].
For this sentence one can set

(3.11) $(\pi \models_{as} \varepsilon) \|\models \upsilon_{way}$;

$((\models_{char} \mathfrak{D}) \subset \upsilon_{way}) \models_{ont}$ □

[3.12] As with existentiality in general [$\mathfrak{S}_{exist} \models$; $\models \mathfrak{S}_{exist}$], we can, in the first instance, only prepare for the problem of possibility [π].

The simplest way to interpret this sentence is formula

(3.12) $\pi \models_{as} (\mathfrak{S}_{exist} \models; \models \mathfrak{S}_{exist})$

In German, this sentence is: ... zunächst kann sie [π] wie Existenzialität überhaupt lediglich als Problem vorbereitet werden. The existentiality as a problem of possibility can be understood within the informing of the system $\mathfrak{S}_{exist} \models$; $\models \mathfrak{S}_{exist}$. □

[3.13] The phenomenal basis [φ_{basis}] for seeing it [π] at all is provided [$\models_{prov}$] by the understanding [$\mathfrak{U}$] as a disclosive potentiality-for-Being [$\pi_{for-Being}$].

The adequate, universalized formula to this sentence is, for instance,

(3.13) $(\mathfrak{U} \models_{as} \pi_{for-Being}) \models_{prov}$
$((\varphi_{basis} \models \pi) \models \varphi_{basis})$

The phrase 'for seeing it at all' remains hidden in the process $(\varphi_{basis} \models \pi) \models \varphi_{basis}$. □

2.4. THE FOURTH PARAGRAPH OF § 31 [BT]

[4.1] Possibility [π], as an *existentiale* [ε_{exist}], does not signify [$\not\models_{sign}$] a free-floating potentiality-for- Being [$\pi_{for-Being} \models$; $\models \pi_{for-Being}$] in the sense [σ_{sense}] of the 'liberty of indifference' [$\lambda_{liber(\iota_{indiff})}$] (*libertas indifferentiae*).
The formula is

(4.1) $(\pi \models_{as} \varepsilon_{exist}) \not\models_{sign}$
$((\pi_{for-Being} \models; \models \pi_{for-Being}) \models$
$\sigma_{sense}(\lambda_{liber(\iota_{indiff})}))$ □

[4.2] In every case Dasein [$\mathfrak{D}$], as essentially having [$\subset_{essen}$] a state-of-mind [$\mathfrak{S}_{mind}$], has already got [$\models_{already}$] itself into definite possibilities [π_{def}].
The rough formula for this sentence is

(4.2) $(\mathfrak{S}_{mind} \subset_{essen} \mathfrak{D}) \models_{already} (\mathfrak{D} \subset \pi_{def})$

where we did not consider the entity 'in every case' which could be expressed, for instance, by operator $\forall$ at the end of formula (4.2). It is to mention that the German sentence: Das Dasein ist als wesenhaft befindliches ... gives also a 'direct' formula $\mathfrak{D} \models_{\text{as\_essen}} \mathfrak{S}_{\text{mind}}$. $\square$

[4.3] As the potentiality-for-Being [$\pi_{\text{for-Being}}$] which is *is* [$\pi_{\text{for-Being}} \models; \models \pi_{\text{for-Being}}$], it [$\mathfrak{D}$] has let such possibilities [$\pi(\pi_{\text{for-Being}})$] pass by [$\models_{\text{pass\_by}}$]; it is constantly waiving [$\models_{\text{waive}}$] the possibilities of its Being [$\pi(\mathfrak{B}(\mathfrak{D}))$], or else [in parallel] it seizes [$\models_{\text{seize}}$] upon them [$\pi(\mathfrak{B}(\mathfrak{D}))$] and makes [$\models$] mistakes [$\mu_{\text{mistake}}$].

For this sentence we get a system of formulas, that is,

$$(4.3) \quad (\mathfrak{D} \models_{\text{as}} (\pi_{\text{for-Being}} \models; \models \pi_{\text{for-Being}}))$$
$$\models_{\text{pass\_by}} ((\pi_{\text{for- Being}});$$
$$\mathfrak{D} \models_{\text{waive}} \pi(\mathfrak{B}(\mathfrak{D}));$$
$$(\mathfrak{D} \models_{\text{seize}} \pi(\mathfrak{B}(\mathfrak{D}))) \models \mu_{\text{mistake}} \square$$

[4.4] But this [formula (4.3) marked by $\varphi_{(4.3)}$] means [$\Leftrightarrow$] that Dasein is Being-possible [$\mathfrak{D} \models \mathfrak{B}_{\text{possible}}$] which has been delivered [$\models_{\text{deliver}}$] over to itself [$\mathfrak{D}$]—*thrown possibility* [π_{thrown}] through and through [$\models_{\text{through}}$].

Thus, the resulting formula is

$$(4.4) \quad \varphi_{(4.3)} \Leftrightarrow ((((\mathfrak{D} \models \mathfrak{B}_{\text{possible}}) \models_{\text{deliver}} \mathfrak{D})$$
$$\models \pi_{\text{thrown}})) \models_{\text{through}}$$

This formula is nothing else than an explanation of formula (4.3), marked by $\varphi_{(4.3)}$. The original German sentence, for comparison, is: Das besagt aber: das Dasein ist ihm selbst überantwortetes Möglichsein, durch und durch *geworfene Möglichkeit*. $\square$

[4.5] Dasein [$\mathfrak{D}$] is the possibility [π] of Being-free [$\mathfrak{B}_{\text{free}}$] *for* its ownmost potentiality-for-Being [$\pi_{\text{for-Being}}(\mathfrak{D})$].

The formula for the last sentence is

$$(4.5) \quad (\mathfrak{D} \models \pi(\mathfrak{B}_{\text{free}})) \models_{\text{for}} \pi_{\text{for-Being}}(\mathfrak{D}) \square$$

[4.6] Its [$\mathfrak{D}$] Being-possible [$\mathfrak{B}_{\text{possible}}(\mathfrak{D})$] is transparent [$\models_{\text{trans}}$] to itself [$\mathfrak{D}$] in different possible ways and degrees [$\alpha_{\text{poss\_ways}}$].

The formula for this sentence is

$$(4.6) \quad (\mathfrak{B}_{\text{possible}}(\mathfrak{D}) \models_{\text{trans}} \mathfrak{D}) \models \alpha_{\text{poss\_ways}} \square$$

2.5. *THE FIFTH PARAGRAPH OF § 31 [BT]*

[5.1] Understanding [$\mathfrak{U}$] is the Being [$\mathfrak{B}$] of such potentiality-for-Being [$\pi_{\text{for-Being}}$], which is never [$\not\models$] something still outstanding [$\alpha_{\text{still\_out}}$] as not yet [$\models_{\text{as\_not\_yet}}$] present-at-hand [$\pi_{\text{at\_hand}}$], but which [in parallel] as something [α] which is essentially never [$\not\models_{\text{essen}}$] present-at-hand, *'is'* with [$\models_{\text{with}}$] the Being of Dasein [$\mathfrak{B}(\mathfrak{D})$], in the sense of existence [σ_{exist}].

The frame system of formulas for this sentence is

$$(5.1) \quad (\mathfrak{U} \models \mathfrak{B}(\pi_{\text{for-Being}})) \not\models$$
$$(\alpha_{\text{still-out}} \models_{\text{as\_not\_yet}} \pi_{\text{at\_hand}});$$
$$((\mathfrak{B}(\pi_{\text{for-Being}}) \models_{\text{as}} \alpha) \not\models_{\text{essen}} \pi_{\text{at\_hand}})$$
$$\models_{\text{with}} (\mathfrak{B}(\mathfrak{D}) \subset \sigma_{\text{exist}}) \square$$

[5.2] Dasein is such that in every case [$\forall$] it has understood [$\models_{\mathfrak{U}}$] (or alternatively, [in parallel] not understood [$\not\models_{\mathfrak{U}}$]) that it is to be thus or thus [$\mathfrak{D} \models; \models \mathfrak{D}$].

Let the first approximation of this sentence be

$$(5.2) \quad (\mathfrak{D} \forall (\mathfrak{D} \models_{\mathfrak{U}}; \mathfrak{D} \not\models_{\mathfrak{U}})) \models (\mathfrak{D} \models; \models \mathfrak{D})$$

Several objections can be made to the last formula. First operator $\forall$ could be particularized into $\models_{\text{always}}$ or even into $\models_{\text{such\_t\_e\_c}}$ with the meaning 'is_such_that_in_every_case'. Further, *to be thus or thus* pertaining to Dasein $\mathfrak{D}$ and understanding $\mathfrak{U}$ could be formally interpreted as

$$(5.2') \quad (\mathfrak{D} \forall (\mathfrak{D} \models_{\mathfrak{U}}; \mathfrak{D} \not\models_{\mathfrak{U}})) \models$$
$$(((\mathfrak{D} \models \mathfrak{U}) \models \mathfrak{D});$$
$$(\mathfrak{D} \dashv (\mathfrak{U} \dashv \mathfrak{D}));$$
$$((\mathfrak{D} \not\models \mathfrak{U}) \not\models \mathfrak{D});$$
$$(\mathfrak{D} \not\dashv (\mathfrak{U} \not\dashv \mathfrak{D})))$$

Certainly, other interpretations of the sentence are possible. $\square$

[5.3] As such understanding [$\mathfrak{U}$] it [$\mathfrak{D}$] 'knows' [$\models_{\text{know}}$] *what* it [$\mathfrak{D}$] is capable [$\models_{\text{cap}}$]—that is,

what its potentiality-for-Being [$\pi_{\text{for-Being}}(\mathfrak{D})$] is capable of.

One of possible formal interpretations of this sentence is the following:

(5.3) $(\mathfrak{D} \models_{\text{as}} \mathfrak{U}) \models_{\text{know}} ((\mathfrak{D} \models_{\text{cap}}),$
     $\pi_{\text{for-Being}}(\mathfrak{D}) \models_{\text{cap}})$

As we see, the 'what' [$\mathfrak{W}_{\text{what}}$] in the capability of informing of $\mathfrak{D}$ is ignored, however, it can be explicitly considered within the structure of the previous formula, closing it to some extent in the following way:

(5.3') $(\mathfrak{D} \models_{\text{as}} \mathfrak{U}) \models_{\text{know}} ((\mathfrak{D} \models_{\text{cap}} \mathfrak{W}_{\text{what}}),$
     $\pi_{\text{for-Being}}(\mathfrak{D}) \models_{\text{cap}} \mathfrak{W}_{\text{what}})$ □

[5.4] This 'knowing' [$\mathfrak{R}_{\text{know}}(\mathfrak{D}) = \varphi_{(5.3)}$] does not first arise [$\not\models_{\text{first}}$] from an immanent self-perception [$\mathfrak{P}_{\text{imm}}(\mathfrak{D})$], but [in parallel] belongs [$\subset$] to the Being of the "there" [$\mathfrak{B}(\tau_{\text{there}})$], which is essentially [$\models_{\text{essential}}$] understanding [$\mathfrak{U}$].

This sentence sounds understandingly and can be immediately formalized as

(5.4) $\mathfrak{R}_{\text{know}}(\mathfrak{D}) \not\models_{\text{first}} \mathfrak{P}_{\text{imm}}(\mathfrak{D});$
     $\mathfrak{R}_{\text{know}}(\mathfrak{D}) \subset (\mathfrak{B}(\tau_{\text{there}}) \models_{\text{essential}} \mathfrak{U})$

Operand $\mathfrak{R}_{\text{know}}(\mathfrak{D})$ is a occurrence of formula $\varphi_{(5.3)}$ in which $\mathfrak{D}$ as understanding informs capably. □

[5.5] And only *because* Dasein, in understanding [$(\mathfrak{D} \models \mathfrak{U}) \models \mathfrak{D}$], is its "there" [$\tau_{\text{there}}(\mathfrak{D})$], *can* it go astray [$\models_{\text{astray}}$] and fail to recognize [$\models_{\text{fail\_to\_recognize}}$] itself.

The symbolic interpretation of this sentence is

(5.5) $(((\mathfrak{D} \models \mathfrak{U}) \models \mathfrak{D}) \models \tau_{\text{there}}(\mathfrak{D})) \Rightarrow$
     $(\mathfrak{D} \models_{\text{astray}}; \mathfrak{D} \models_{\text{fail\_to\_recognize}} \mathfrak{D})$ □

[5.6] And in so far as understanding is *accompanied by* [$\models_{\text{accomp\_by}}$] state-of-mind [$\mathfrak{S}_{\text{mind}}$] and as such is existentially surrendered [$\models_{\text{exist\_surr}}$] to throwness [$\tau_{\text{thrown}}$], Dasein has in every case already [$\forall_{\text{already}}$] gone astray [$\models_{\text{astray}}$] and failed to recognize [$\models_{\text{fail\_to\_recognize}}$] itself.

One of the adequate formulas to this sentence could be

(5.6) $((\mathfrak{U} \models_{\text{accomp\_by}} \mathfrak{S}_{\text{mind}}) \models_{\text{exist\_surr}}$
     $\tau_{\text{thrown}}) \Rightarrow$
     $(\mathfrak{D} \forall_{\text{already}} (\mathfrak{D} \models_{\text{astray}} \mathfrak{D};$
     $\mathfrak{D} \models_{\text{fail\_to\_recognize}} \mathfrak{D}))$ □

[5.7] In its [$\mathfrak{D}$] potentiality-for-Being [$\pi_{\text{for-Being}}$] it is therefore delivered [$\models_{\text{deliver}}$] over to the possibility of first finding [$\models_{\text{first\_find}}$] itself again in its possibilities [$\pi(\mathfrak{D})$].

Thus, the last sentence of the 5th paragraph becomes formally

(5.7) $(\mathfrak{D} \subset \pi_{\text{for-Being}}(\mathfrak{D})) \models_{\text{deliver}}$
     $(\pi(\mathfrak{D} \models_{\text{first\_find}} \mathfrak{D}) \subset \pi(\mathfrak{D}))$

Thus, we have, in a framing manner, formalized the sentences of the fifth paragraph. □

2.6. THE SIXTH PARAGRAPH OF § 31 [BT]

[6.1] *Understanding* [$\mathfrak{U}$] *is* [$\models$] *the existential Being* [$\mathfrak{B}_{\text{exist}}$] *of Dasein's own potentiality-for-Being* [$(\mathfrak{D} \models \pi_{\text{for-Being}}(\mathfrak{D})) \models \mathfrak{D}$]; *and it* [$\mathfrak{U}$] *is so in such a way that this Being discloses* [$\models_{\text{discl}}$] *in itself* [$\mathfrak{B}_{\text{exist}}$] *what* [$\mathfrak{W}_{\text{what}}$] *its Being is capable of* [$\models_{\text{cap}}$].

This sentence leaves open various possibilities. One of them, as an initial situation, is, for instance,

(6.1) $((\mathfrak{U} \models \mathfrak{B}_{\text{exist}}((\mathfrak{D} \models \pi_{\text{for-Being}}(\mathfrak{D})) \models \mathfrak{D}))$
     $\models_{\text{discl}} \mathfrak{B}_{\text{exist}}) \models_{\text{cap}} \mathfrak{W}_{\text{what}}(\mathfrak{B}_{\text{exist}})$

It is not for the first time that we use the operand form $\xi(\eta)$ instead of the explicit operator form ξ $\models_{\text{of}} \eta$. This convention comes probably from the mathematical way of thinking. However, we must be aware that in $\xi(\eta)$, entity η can take the form of an informational formula, arbitrarily complex, open, circular, etc. And this happens in case of $\mathfrak{B}_{\text{exist}}((\mathfrak{D} \models \pi_{\text{for-Being}}(\mathfrak{D})) \models \mathfrak{D}))$, where $\mathfrak{B}_{\text{exist}}$ is in position of ξ, etc. □ ·

[6.2] [We must grasp the structure of this *existentiale* more precisely.]

This sentence is a comment on that what has to follow in the next paragraphs. □

2.7. *THE SEVENTH PARAGRAPH OF § 31 [BT]*

[7.1] As [$\models_{as}$] a disclosure [$\mathfrak{D}_{discl}$], understanding [$\mathfrak{U}$] always pertains to [$\forall_{pertain}$] the whole basic state [$\mathfrak{W}_{basic\_state}$] of Being-in-the-world [$\mathfrak{B}_{in\text{-}the\text{-}world}$].

A formula for this sentence is

$$(7.1) \quad (\mathfrak{U} \models_{as} \mathfrak{D}_{discl}) \; \forall_{pertain} \\ \mathfrak{W}_{basic\_state}(\mathfrak{B}_{in\text{-}the\ world}) \; \square$$

[7.2] As [$\models_{as}$] a potentiality-for-Being [$\pi_{for\text{-}Being}$], any Being-in [$\mathfrak{B}_{in}$] is a potentiality-for-Being-in-the-world [$\pi_{for}(\mathfrak{B}_{in\text{-}the\text{-}world})$].

$$(7.2) \quad (\mathfrak{B}_{in} \models_{as} \pi_{for}(\mathfrak{B}_{in\text{-}the\text{-}world}) \; \square$$

[7.3] Not only is the world [$\mathfrak{W}_{world}$], *qua* world, disclosed [$\models_{discl}$] as possible significance [ξ_{sign_poss}], but [$\models_{but}$ or in parallel] when that [α] which is within-the-world [$\alpha \subset \mathfrak{W}_{world}$] is [$\Rightarrow$] itself freed [$\alpha \models_{free} \alpha$], this entity is freed for *its own* possibilities [$\pi(\alpha)$].

In this sentence two implicative operators appear, where the first one has the meaning of 'when ..., then ...' and the second one of 'if ..., then ...'. So,

$$(7.3) \quad ((\mathfrak{W}_{world} \models_{as} \mathfrak{W}_{world}) \models_{discl} \xi_{sign\_poss}) \\ \models_{but} \\ (((\alpha \subset \mathfrak{W}_{world}) \Rightarrow (\alpha \models_{free} \alpha)) \Rightarrow \\ (\pi(\alpha) \models_{free} \alpha)) \; \square$$

[7.4] That [α] which is ready-to-hand [$\mathfrak{R}_{to\text{-}hand}$] is discovered as [$\models_{discover\_as}$] such in its service*ability* [$\mathfrak{A}_{service}$], its us*ability* [$\mathfrak{A}_{use}$], and its detriment*ality* [$\mathfrak{A}_{detriment}$].

The appropriate formula is, for instance,

$$(7.4) \quad (\alpha \models_{as} \mathfrak{A}_{service}(\alpha); \; \alpha \models_{as} \mathfrak{A}_{use}(\alpha); \\ \alpha \models_{as} \mathfrak{A}_{detriment}(\alpha)) \models_{discover\_as} \\ (\alpha \models \mathfrak{R}_{to\text{-}hand}) \; \square$$

[7.5] The totality of involvements [$\tau_{total}(\iota_{involve})$] is revealed as [$\models_{reveal\_as}$] the categorial whole [$\mathfrak{W}_{categorial}$] of a *possible* interconnection [$\pi_{interconn}$] of the ready-to-hand [$\mathfrak{R}_{to\text{-}hand}$].

The corresponding formula is, for example,

$$(7.5) \quad (\mathfrak{W}_{categorial} \models_{reveal\_as} \tau_{total}(\iota_{involve}))$$

$$\models_{of} \pi_{interconn}(\mathfrak{R}_{to\text{-}hand}) \; \square$$

[7.6] But even the 'unity' [υ_{unity}] of the manifold [$\mu_{manifold}$] present-at-hand [$\pi_{at\text{-}hand}$], of Nature [$\mathfrak{N}$], can be discovered [$\models_{discover}$] only if a *possibility* of it [$\pi(\upsilon_{unity})$] has been disclosed [$\models_{discl}$].

An open formula for this sentence is

$$(7.6) \quad (\models_{discl} \pi(\upsilon_{unity}))) \Rightarrow \\ (\models_{discover} (\upsilon_{unity}(\mu_{manifold}(\pi_{at\text{-}hand})), \\ \upsilon_{unity}(\mathfrak{N}))) \; \square$$

[7.7] Is it [$\models_{quest}$] accidental [$\models_{accid}$] that the question [$\mathfrak{Q}_{question}$] about [$\models_{about}$] the *Being* of Nature [$\mathfrak{B}(\mathfrak{N})$] aims at [$\models_{aim\_at}$] the 'conditions of its *possibility*' [$\gamma_{cond}(\pi(\mathfrak{B}(\mathfrak{N})))$]?

This question informs accidentally, that is,

$$(7.7) \quad ((\mathfrak{Q}_{question} \models_{about} (\mathfrak{B}(\mathfrak{N}) \models_{aim\_at} \\ \gamma_{cond}(\pi(\mathfrak{B}(\mathfrak{N}))))) \models_{accid}) \models_{quest} \; \square$$

[7.8] On what [$\mathfrak{W}_{what}$] is such an inquiry [$\varphi_{(7.7)}$] based [$\models_{quest}$]?

The formal information of this sentence is

$$(7.8) \quad \varphi_{(7.7)} \models_{quest} \mathfrak{W}_{what} \; \square$$

[7.9] When confronted [$\models_{confront}$] with this inquiry [$\varphi_{(7.7)}$], we can not leave aside the question: *why* are [$\models_{why}$] entities·[α] which are not of the character of Dasein [$\gamma_{char}(\mathfrak{D})$] understood [$\models_{\mathfrak{U}}$] in their Being [$\mathfrak{B}(\alpha)$], if [$\Leftarrow$] they are disclosed [$\models_{discl}$] in accordance with the conditions [γ_{cond}] of their possibility [$\pi(\alpha)$]?

The formula for this sentence can become rather complicated, however, one of its formal approximations could be

$$(7.9) \quad (\models_{confront} (\varphi_{(7.7)} \models_{quest} \alpha)) \Rightarrow \\ ((((\alpha \not\models \gamma_{char}(\mathfrak{D})) \models_{\mathfrak{U}} \mathfrak{B}(\alpha)) \Leftarrow \\ (\gamma_{cond}(\pi(\alpha)) \models_{discl} \alpha)) \models_{why}) \; \square$$

[7.10] [Kant presupposes something of the sort, perhaps rightly.]

This sentence is taken as an insignificant comment. $\square$

[7.11] [But this presupposition itself is something that cannot be left without demonstrating how it is justified.]

In the next paragraphs this presupposition will be demonstrated. □

2.8. *THE EIGHTH PARAGRAPH OF § 31 [BT]*

[8.1] Why [$\mathfrak{W}_{why}$] does [$\models_{quest}$] the understanding [$\mathfrak{U}$]—whatever may be the essential dimension [ε_{dim}] of that which can be disclosed in [$\models_{discl}$] it—always press forward [$\models_{al\_press\_for}$] into possibilities [π]?

This sentence can be interpreted by the following system of formulas:

(8.1) $(((\varepsilon_{dim}(\alpha \sqsubset_{discl} \mathfrak{U}) \models_{all\_press\_for} \pi) \models \mathfrak{U})$
$\models_{quest} \mathfrak{W}_{why};$
$((\alpha \models \varepsilon_{dim}) \models \alpha) \models \varepsilon_{dim}(\alpha);$
$(\mathfrak{U} \sqsubset_{discl} \varepsilon_{dim}(\alpha)) \sqsubset_{discl} \mathfrak{U}$

This formal system may appear to be stronger than the original sentence, but, it expresses the regular circular power of entities in question. The reader can try to think through this particular situation by himself. □

[8.2] It is because [$\Rightarrow \varphi_{(8.1)}$] the understanding has in itself the existential structure [$\sigma_{exist} \sqsubset \mathfrak{U}$] we call "projection" [$\pi_{project}$].

A simple formula, modeling this sentence, is, for instance,

(8.2) $((\sigma_{exist} \sqsubset \mathfrak{U}) \models \pi_{project}) \Rightarrow \varphi_{(8.1)}$ □

[8.3] With equal primordiality [$\models_{with\_eq\_p}$] the understanding projects Dasein's Being both upon [$\models_{proj\_upon}$] its "for-the-sake-of-which" [$\varphi_{sake}(\mathfrak{U})$] and upon significance [ξ_{sign}], as the worldhood [$\mathfrak{W}_{worldhood}$] of its current world [$\mathfrak{W}_{cur\_world}$].

One of formal possibilities for these sentence is, for instance,

(8.3) $(\mathfrak{U} \models_{with\_eq\_p} \mathfrak{B}(\mathfrak{D})) \models_{proj\_upon}$
$(\varphi_{sake}(\mathfrak{U}), \xi_{sign} \models_{as}$
$\mathfrak{W}_{worldhood}(\mathfrak{W}_{cur\_world}(\mathfrak{U}))$ □

[8.4] The character of understanding [$\Upsilon_{char}(\mathfrak{U})$] as projection [$\pi_{project}$] is constitutive [$\models_{const}$] for Being-in-the-world [$\mathfrak{B}_{in-the-world}$] with regard to [$\models_{with\_regard}$] the disclosedness [$\vartheta_{discl}$] of its existentially constitutive [$\models_{exist\_const}$] state-of-Being

[$\mathfrak{S}_{of-Being}$] by which the factical potentiality-for-Being [$\varphi_{fact}(\pi_{for-Being})$] gets [$\models_{get}$] its leeway [$\lambda_{leeway}(\Upsilon_{char}(\mathfrak{U}))$] [Spielraum].

For this sentence, one of possible formalizations is

(8.4) $((\Upsilon_{char}(\mathfrak{U}) \models_{as} \pi_{project}) \models_{const}$
$\mathfrak{B}_{in\_the-world}) \models_{with\_regard}$
$\vartheta_{discl}((\mathfrak{S}_{of-Being}(\Upsilon_{char}(\mathfrak{U}))) \models_{exist\_const});$
$(\Upsilon_{char}(\mathfrak{U}) \models_{by} \varphi_{fact}(\pi_{for-Being})) \models_{get}$
$\lambda_{leeway}(\Upsilon_{char}(\mathfrak{U}))$

This formula system can be substantially modified by reading of the two equivalent German sentences, which are: Der Entwurfcharakter des Verstehens konstituiert das In-der-Welt-sein hinsichtlich der Erschlossenheit seines Da als Da eines Seinkönnens. Der Entwurf ist die existenziale Seinsverfassung des Spielraums des faktischen Seinkönnens. The modified system for these German sentences is

(8.4') $(\Upsilon_{char}(\pi_{project}(\mathfrak{U})) \models_{const} \mathfrak{B}_{in-the-world})$
$\models_{with\_regard}$
$(\vartheta_{discl}(\tau_{there}(\Upsilon_{char}(\pi_{project}(\mathfrak{U})))) \models_{as}$
$\tau_{there}(\pi_{for-Being}));$
$\pi_{project} \models_{exist}$
$\mathfrak{S}_{of-Being}(\lambda_{leeway}(\varphi_{fact}(\pi_{for-Being})))$ □

[8.5] And as thrown [τ_{thrown}], Dasein is thrown [$\models_{thrown}$] into the kind of Being [$\mathfrak{K}(\mathfrak{B})$] which we call "projecting" [$\mathfrak{P}_{project}$].

The formula is

(8.5) $(\mathfrak{D} \models_{as} \tau_{thrown}) \models_{thrown}$
$(\mathfrak{K}(\mathfrak{B}) \models \mathfrak{P}_{project})$ □

[8.6] Projecting [$\mathfrak{P}_{project}$] has nothing to do with [$\not\models$] comporting [$\mathfrak{S}_{comport}$] oneself [$\omega_{oneself}$] towards a plan [π_{plan}] that has been thought out [$\models_{think\_out}$], and in accordance with [$\dashv_{accord}$] which Dasein arranges [$\models_{arr}$] its Being.

The approximate formula for this sentence can be put as

(8.6) $\mathfrak{P}_{project} \not\models (\mathfrak{S}_{comport}(\omega_{oneself}) \models_{towards}$
$((\models_{think\_out} \pi_{plan})$
$\dashv_{accord} (\mathfrak{D} \models_{arr} \mathfrak{B}(\mathfrak{D}))))$ □

[8.7] On the contrary [$\models_{contra}$], any Dasein has, as Dasein, already projected itself; and as long [$\models_{as\_long\_as}$] as it is, it is projecting [$\mathfrak{P}_{project}$].

The formula system for this sentence is characteristically circular, that is,

(8.7) $\mathfrak{D} \models_{contra} ((\mathfrak{D} \models_{as} \mathfrak{D}) \models_{project} \mathfrak{D})$;
$((\mathfrak{D} \models; \models \mathfrak{D}) \models_{as\_long\_as} \mathfrak{D}) \models \mathfrak{P}_{project}$ □

[8.8] As long as [$\models_{as\_long\_as}$] it is, Dasein always has understood [$\models_{al\_underst}$] itself and always will understand itself in terms of possibilities.

Cyclicity of Dasein and its possibilities is characteristic for this sentence which can be formally interpreted as

(8.8) $(((\mathfrak{D} \models; \models \mathfrak{D}) \models_{as\_long\_as} \mathfrak{D}) \models_{al\_underst}$
$\mathfrak{D}) \models_{as} \pi(\mathfrak{D})$ □

[8.9] Furthermore, the character of understanding [$\Upsilon_{char}(\mathfrak{U})$] as projection [$\pi_{project}$] is such [$\alpha$] that the understanding does not grasp thematically [$\models_{grasp\_thema}$] that upon which [α] it projects—that is to say, possibilities [π].

There is,

(8.9) $(\Upsilon_{char}(\mathfrak{U}) \models \pi_{project}) \models \alpha$;
$\mathfrak{U} \not\models_{grasp\_thema} ((\mathfrak{U}(\alpha) \models_{project} \alpha), \pi)$ □

[8.10] Grasping it [$\mathfrak{G}_{grasp}(\mathfrak{U})$] in such [$\varphi_{(8.9)}$] a manner [$\models_{in\_manner}$] would take away from [$\models_{take\_away}$] what is projected [$\mathfrak{P}_{project}(\alpha)$] its very character as a possibility [$\pi(\Upsilon_{char}(\mathfrak{U}))$], and would reduce [$\models_{reduce}$] it to [$\models_{to}$] the given contents which we have in mind [$\Upsilon_{content}(\mu_{mind})$]; whereas projection [$\pi_{project}$], in throwing [$\mathfrak{T}_{throw}$], throws before [$\models_{throw\_before}$] itself the possibility [π] as possibility, and lets it *be* as such.

This sentence delivers a complex formal interpretation, for instance,

(8.10) $(\mathfrak{G}_{grasp}(\mathfrak{U}) \models_{in\_manner} \varphi_{(8.9)}) \models_{take\_away}$
$((\mathfrak{U} \models \mathfrak{P}_{project}(\alpha)) \models_{as} \pi(\Upsilon_{char}(\mathfrak{U})))$;
$\mathfrak{G}_{grasp}(\mathfrak{U}) \models_{reduce} (\mathfrak{U} \models_{to} \Upsilon_{content}(\mu_{mind}))$;
$((\pi_{project} \subset \mathfrak{T}_{throw}) \models_{throw\_before}$
$\pi_{project}) \models$
$((\pi \models_{as} \pi) \models; \models (\pi \models_{as} \pi))$ □

[8.11] As projecting [$\mathfrak{P}_{project}$], understanding is the kind of Being of Dasein [$\mathfrak{R}(\mathfrak{B}(\mathfrak{D}))$] in which it *is* its possibilities [$\pi(\mathfrak{U})$] as possibilities.

Thus, for the last sentence of this paragraph, there is, formally,

(8.11) $(\mathfrak{U} \models (\pi(\mathfrak{U}) \models_{as} \pi(\mathfrak{U}))) \subset$
$((\mathfrak{U} \models_{as} \mathfrak{P}_{project}) \models \mathfrak{R}(\mathfrak{B}(\mathfrak{D})))$ □

2.9. THE NINTH PARAGRAPH OF § 31 [BT]

[9.1] Because [$\Rightarrow$] of the kind of Being [$\mathfrak{R}(\mathfrak{B})$] which is constituted [$\models_{const}$] by the *existentiale* of projection [$\varepsilon_{exist}(\pi_{project})$], Dasein is constantly 'more' [$\mathfrak{D} \models_{constantly} \mu_{more}(\mathfrak{D})$] than [$\models_{than}$] it factually [$\models_{factually}$] is, supposing [$\Rightarrow$] that one [$o_{one}$] might want to make [$\models_{make}$] an inventory of it [$\iota_{inventory}(\mathfrak{D})$] as [$\models_{as}$] something-at-hand [$\alpha_{at-hand}$] and list [$\models_{list}$] the contents of its Being [$\Upsilon_{content}(\mathfrak{B}(\mathfrak{D}))$], and supposing that one were able [$\models_{able}$] to do so.

The approximate formalization of this sentence might be a single implicative formula

(9.1) $(o_{one} \models_{able}$
$((o_{one} \models_{make} (\iota_{inventory}(\mathfrak{D}) \models_{as}$
$\alpha_{at\_hand})),$
$(o_{one} \models_{list} \Upsilon_{content}(\mathfrak{B}(\mathfrak{D}))))) \Rightarrow$
$((\varepsilon_{exist}(\pi_{project}) \models_{const} \mathfrak{R}(\mathfrak{B})) \Rightarrow$
$((\mathfrak{D} \models_{constantly} \mu_{more}(\mathfrak{D})) \models_{than}$
$(\mathfrak{D} \models_{factually}; \models_{factually} \mathfrak{D})))$ □

[9.2] But [$\Leftarrow$] Dasein is never more than [$\not\models_{more\_than}$] it factually is [$\models_{factically}$], for to its facticity [$\varphi_{fact}(\mathfrak{D})$] its potentiality-for-Being [$\pi_{for-Being}(\mathfrak{D})$] belongs essentially [$\in_{essen}$].

One of the implicative formulas for this sentence is

(9.2) $(\mathfrak{D} \not\models_{more\_than} (\mathfrak{D} \models_{factically})) \Leftarrow$
$(\pi_{for-Being}(\mathfrak{D}) \in_{essen} \varphi_{fact}(\mathfrak{D}))$ □

[9.3] Yet [$\models_{yet}$] as Being-possible [$\mathfrak{B}_{possible}$], moreover, Dasein is never anything [α] less [$\not\models_{less}$]; that is to say [in parallel], it is existentially [$\models_{exist}$] that which in its potentiality-for-Being [$\pi_{for-Being}(\mathfrak{D})$], it is *not yet* [$\not\models_{yet}$].

A formal depiction of this sentence could be, for instance,

(9.3) $((\mathfrak{D} \models_{as} \mathfrak{B}_{possible}) \not\models_{less} \alpha) \models_{yet} \mathfrak{D}$;

$(\mathfrak{D} \models_{exist} \alpha) \models_{in} (\mathfrak{D} \not\models_{yet} \pi_{for-Being}(\mathfrak{D}))$

We can certainly bring up some slightly modified formulas for this sentence through the displacement of several operators. □

[9.4] Only because [$\models_{only\_because}$] the Being of the "there" [$\mathfrak{B}(\tau_{there})$] receives its Constitution [γ_{const}] through [$\models_{through}$] understanding and through the character of understanding [$\gamma_{char}(\mathfrak{U})$] as projection [$\pi_{project}$], only because it *is* what it becomes (or, alternatively, does not become), can it say to itself 'Become what you are', and say this with [$\models_{say\_with}$] understanding.

This sentence is rather complicated as it can be seen from the following formal example of it:

(9.4) $((\mathfrak{B}(\tau_{there}) \models_{say} \mathfrak{B}(\tau_{there}))$

$\models_{say\_with} \mathfrak{U}(\mathfrak{B}(\tau_{there}))) \models_{only\_because}$

$((\mathfrak{B}(\tau_{there}) \models_{receive} \gamma_{const}(\mathfrak{B}(\tau_{there})))$

$\models_{through} ((\mathfrak{U}; \gamma_{char}(\mathfrak{U}) \models_{as} \pi_{project});$

$(\mathfrak{B}(\tau_{there}) \models; \models \mathfrak{B}(\tau_{there});$

$\not\models \mathfrak{B}(\tau_{there}); \mathfrak{B}(\tau_{there}) \not\models)))$

The construction of this formula begins from the last part of the sentence, for sentence as a whole expresses an implicative intention [operator $\models_{only\_because}$]. Several explanations to formula (9.4) can be given which can substantially impact the understanding of the original sentence in a circular spontaneous manner and, simultaneously, stressing the way of Being of understanding in question together with the possibilities of its informational formal expression. For instance, the syntagma *it is what it becomes (or alternatively does not become)* concerning the Being of the "there", in the last formula is expressed in a completely and not only metaphysically open form, that is

$\mathfrak{B}(\tau_{there}) \models; \models \mathfrak{B}(\tau_{there});$

$\not\models \mathfrak{B}(\tau_{there}); \mathfrak{B}(\tau_{there}) \not\models$

where even the alternative general operator of non-informing $\not\models$ instead of $\not\models$ is used. The reader may imagine some further implications in possibilities of using such spontaneous circular mechanisms in an informational machine. □

2.10. *THE TENTH PARAGRAPH OF § 31 [BT]*

[10.1] Projection [$\pi_{project}$] always pertains to [$\models_{always} \circ \models_{pertain}$] the full disclosedness [$\varphi_{full}(\vartheta_{disclose})$] of Being-in-the-world [$\mathfrak{B}_{in-the-world}$]; as potentiality-for-Being [$\pi_{for-Being}$], understanding has itself possibilities which are sketched out beforehand [$\models_{sketch\_out\_beforehand}$] within the range [$\rho_{range}$] of what is essentially disclosable [$\models_{essen} \circ \models_{discl}$] in it.

This sentence can be reasonably decomposed in three consequent formulas:

(10.1) $\pi_{project} \models_{always} \circ \models_{pertain}$

$\varphi_{full}(\vartheta_{disclose}(\mathfrak{B}_{in-the-world}))$;

$\pi(\mathfrak{U}) \subset (\mathfrak{U} \models_{as} \pi_{for-Being}))$;

$\pi(\mathfrak{U}) \models_{sketch\_out\_beforehand} (\pi(\mathfrak{U}) \subset$

$((\rho_{range} \models_{essen} \circ \models_{discl} \mathfrak{B}_{what})$

$\models_{essen} \circ \models_{discl} \rho_{range}))$

In this system we introduced two composed types of operators between operands, that is, operator composition $\models_{always} \circ \models_{pertain}$ and $\models_{essen} \circ \models_{discl}$. This does not mean that in these compositions the left operator pertains merely to the left operand and the right operator merely to the right operand. Such explicit operator composition pertains always to both operands. Operators, possessing transitive function, can be understood as distributed operational units, interwoven with operands. □

[10.2] Understanding *can* devote itself primarily [$\models_{devote}$] to [$\models_{prim\_to}$] the disclosedness of the world [$\vartheta_{disclose}(\mathfrak{B}_{world})$]; that is, Dasein can, proximally [$\models_{prox}$] and for the most part [$\models_{most\_part}$], understand [$\models_{\mathfrak{U}}$] itself in terms of its world [$\mathfrak{B}_{world}(\mathfrak{D})$].

Using operator composition of the form $\models_{prox} \circ \models_{most\_part}$, the last sentence can be formalized in the following way:

(10.2) $(\mathfrak{U} \models_{devote} \mathfrak{U}) \models_{prim\_to} \vartheta_{disclose}(\mathfrak{B}_{world})$;

$(\mathfrak{D} \models_{\mathfrak{U}} \mathfrak{D}) \models_{prox} \circ \models_{most\_part} \mathfrak{B}_{world}(\mathfrak{D})$

As one can see, the function of operators $\models_{devote}$ and $\models_{\mathfrak{U}}$ becomes transitive in regard to operator $\models_{prim\_to}$ and to operator composition $\models_{prox} \circ \models_{most\_part}$, respectively. □

[10.3] Or else [in parallel] understanding throws [$\models_{throw}$] itself primarily into [$\models_{prim\_into}$] the "for-the-sake-of-which" [φ_{sake}]; that is, Dasein exists as [$\models_{exist\_as}$] itself.

With the transitive function of operator $\models_{throw}$ in regard to operator $\models_{prim\_into}$ one can formalize this sentence as

(10.3) $(\mathfrak{U} \models_{throw} \mathfrak{U}) \models_{prim\_into} \varphi_{sake};$
$\mathfrak{D} \models_{exist\_as} \mathfrak{D} \ \square$

[10.4] Understanding is either [$\models_{either}$] authentic [$\mathfrak{U}_{auth}$], arising out of [$\models_{arise\_out}$] one's own Self [$\sigma_{self}(o_{one})$] as such, or inauthentic [$\mathfrak{U}_{inauth}$].

One of possible formulas for this sentence is

(10.4) $(\mathfrak{U} \models_{either} (\mathfrak{U}_{auth} \models_{arise\_out}$
$(\sigma_{self}(o_{one}) \models_{as} \sigma_{self}))) \models_{or}$
$(\mathfrak{U} \models \mathfrak{U}_{inauth}) \ \square$

[10.5] The 'in-' [ι_{in}] of "inauthentic" [ι_{inauth}] does not mean [$\not\models_{mean}$] that Dasein cuts itself off [$\models_{cut\_off}$] from its Self [$\sigma_{self}(\mathfrak{D})$] and understands 'only' [$\models_{\mathfrak{U}\circ}\models_{only}$] the world.

There is, formally,

(10.5) $(\iota_{in} \models_{of} \iota_{inauth}) \not\models_{mean}$
$((\mathfrak{D} \models_{cut\_off} \mathfrak{D}) \models_{from} \sigma_{self}(\mathfrak{D}));$
$\iota_{inauth} \not\models_{mean} (\mathfrak{D} \models_{\mathfrak{U}\circ}\models_{only} \mathfrak{W}_{world}) \ \square$

[10.6] The world belongs to [$\in$] Being-one's-Self [$\mathfrak{B}_{one's\text{-}self}$] as Being-in-the-world.

A simple formalization of this sentence is

(10.6) $(\mathfrak{W}_{world} \models_{as} \mathfrak{B}_{in\text{-}the\text{-}world}) \in \mathfrak{B}_{one's\text{-}Self} \ \square$

[10.7] On the other hand [in parallel], authentic understanding [$\mathfrak{U}_{auth}$], no less than that which is inauthentic [$\mathfrak{U}_{inauth}$], can be either genuine [one can choose $\gamma_{genuine}$] or not genuine.

A further way of formalization of authentic and inauthentic understanding is, according to the last sentence,

(10.7) $(\mathfrak{U}_{auth}, \mathfrak{U}_{inauth} \models_{either} \gamma_{genuine}) \models_{or}$
$(\mathfrak{U}_{auth}, \mathfrak{U}_{inauth} \not\models \gamma_{genuine}) \ \square$

[10.8] As potentiality-for-Being [$\pi_{for\text{-}Being}$], understanding is altogether permeated [$\models_{permeate}$] with possibility.

There is

(10.8) $\pi \models_{permeate} (\mathfrak{U} \models_{as} \pi_{for\text{-}Being}) \ \square$

[10.9] When one [o_{one}] is diverted [$\models_{divert}$] into [Sichverlegen in] one of these basic possibilities [π_{basic_1}] of understanding, the other [π_{basic_2}] is not laid aside [$\models_{lay\_aside}$] [legt ... nicht ab].

We separately marked the one and the other basic possibility, thus,

(10.9) $(\pi_{basic\_1}(\mathfrak{U}) \models_{divert} o_{one}) \Rightarrow$
$(\not\models_{lay\_aside} \pi_{basic\_2}(\mathfrak{U}))$

This formula is a temporal implication which pertains to the form *when ... then ...* of the last sentence. $\square$

[10.10] *Because understanding, in every case, pertains rather to* [$\models_{always}\circ\models_{pertain}$] *Dasein's full disclosedness* [$\varphi_{full}(\vartheta_{disclose}(\mathfrak{D}))$] *as Being-in-the-world, this diversion* [$\vartheta_{diversion}$] *of the understanding is an existential* [$\models_{exist}$] *modification of projection* [$\mu_{modif}(\pi_{project})$] *as a whole* [$\mathfrak{W}_{whole}$].

One possible formal interpretation of this sentence is

(10.10) $((\mathfrak{U} \models_{as} \mathfrak{B}_{in\text{-}the\text{-}world}) \models_{always}\circ\models_{pertain}$
$\varphi_{full}(\vartheta_{disclose}(\mathfrak{D}))) \Rightarrow$
$((\vartheta_{diversion}(\mathfrak{U}) \models_{as} \mathfrak{W}_{whole}) \models_{exist}$
$\mu_{modif}(\pi_{project}))$

For the right side of this implication we could put also

$\vartheta_{diversion}(\mathfrak{U}) \models_{exist}$
$(\mu_{modif}(\pi_{project}) \models_{as} \mathfrak{W}_{whole})$

depending of our understanding of the sentence. $\square$

[10.11] In understanding the world [$\mathfrak{U}(\mathfrak{W}_{world})$], Being-in is always understood [$\models_{always}\circ\models\mathfrak{U}$] along with it [$\mathfrak{B}_{in}(\mathfrak{U}(\mathfrak{W}_{world}))$], while [in parallel] understanding of existence [$\mathfrak{U}(\varepsilon_{ex})$] as such is always an understanding of the world.

Formalization of this sentence is, for instance,

(10.11) $\mathfrak{U}(\mathfrak{W}_{world}) \models_{always}\circ\models\mathfrak{U} \ \mathfrak{B}_{in}(\mathfrak{U}(\mathfrak{W}_{world}));$
$(\mathfrak{U}(\varepsilon_{ex}) \models_{as} \mathfrak{U}(\varepsilon_{ex})) \models_{always} \mathfrak{U}(\mathfrak{W}_{world})$

The while in the last sentence is interpreted by the parallelism of formulas, however, it could also be expressed explicitly introducing a particular operator. □

2.11. *THE ELEVENTH PARAGRAPH OF § 31 [BT]*

[11.1] As factical Dasein [$\mathfrak{D}_{fact}$], any Dasein has already diverted [$\models_{divert}$] its potentiality-for-Being into [$\models_{into}$] a possibility of understanding.

A straightforward formula for this sentence is

(11.1) $(\mathfrak{D} \models_{as} \mathfrak{D}_{fact}) \models_{divert}$
$(\pi_{for\text{-}Being}(\mathfrak{D}) \models_{into} \pi(\mathfrak{U}))$

In this formula, the diverting (operator $\models_{divert}$) means *'diverts'* as *'has already diverted'*. □

2.12. *THE TWELFTH PARAGRAPH OF § 31 [BT]*

[12.1] In [$\models_{in}$] its projective character [$\Upsilon_{char}(\pi_{project}(\mathfrak{U}))$], understanding goes to make up [$\models_{make\_up}$] existentially [$\models_{exist}$] what we call Dasein's *"sight"* [$\sigma_{sight}(\mathfrak{D})$] [*Sicht*].

We interpret this sentence by formula

(12.1) $\Upsilon_{char}(\pi_{project}(\mathfrak{U})) \models_{in}$
$(\mathfrak{U} \models_{make\_up} \circ \models_{exist} \sigma_{sight}(\mathfrak{D}))$

The 'in' at the beginning of the sentence has the meaning 'inform(s) in' (operator $\models_{in}$). □

[12.2] With the disclosedness of the "there" [$\vartheta_{disclose}(\tau_{there})$], this sight [$\sigma_{sight}(\mathfrak{D})$] is existentially [$\models_{exist}$] [*existenzial seiende*]; and Dasein *is* this sight equiprimordially in each of those basic ways [$\models_{equi\_p} \circ \models_{always}$] of its Being which we have already noted: as the circumspection [$\Upsilon_{circumsp}$] [*Umsicht*] of concern [$\Upsilon_{concern}$], as the considerateness [$\Upsilon_{consider}$] [*Rücksicht*] of solicitude [$\pi_{solicitude}$], and as that sight [σ_{sight}] which is directed upon Being as such [$\mathfrak{B} \models_{as} \mathfrak{B}$] [*Sicht auf das Sein als solches*], for the sake of which [$\models_{sake}$] any Dasein is as it is [$\mathfrak{D} \models; \models \mathfrak{D}$].

We can formally interpret this sentence by a system of two formulas:

(12.2) $\sigma_{sight}(\mathfrak{D}) \models_{with} (\vartheta_{disclose}(\tau_{there}) \models_{exist});$
$((\mathfrak{D} \models \sigma_{sight}(\mathfrak{D})) \models_{equi\_p} \circ \models_{always}$
$\mathfrak{B}(\mathfrak{D})) \models_{as}$
$(\Upsilon_{circumsp}(\Upsilon_{concern}), \Upsilon_{consider}(\pi_{solicitude}),$
$\sigma_{sight}((\mathfrak{B} \models_{as} \mathfrak{B}) \models_{sake} (\mathfrak{D} \models; \models \mathfrak{D})))$

In this case, the meaning of operator $\models_{exist}$ is 'inform(s) existentially'. □

[12.3] The sight [$\sigma_{sight}(\mathfrak{D})$] which is related primarily and on the whole to [$\models_{rel\_prim\_whole}$] existence [ε_{ex}] we call *"transparency"* [$\tau_{transpar}$] [*Durchsichtigkeit*].

There is .

(12.3) $(\varepsilon_{ex} \models_{rel\_prim\_whole} \sigma_{sight}(\mathfrak{D})) \models \tau_{transpar}$

In this formula, operator $\models_{rel\_prim\_whole}$ is a composition of operators $\models_{relate}$, $\models_{primarily}$, and $\models_{on\_the\_whole}$, that is, for instance,

$$(\models_{relate} \circ \models_{primarily}) \circ \models_{on\_the\_whole} \ \square$$

[12.4] We choose this term [$\tau_{transpar}$] to designate 'knowledge of the Self' [$\mathfrak{K}_{know}(\sigma_{self})$] in a sense which is well understood [$\sigma_{sense}(\mathfrak{U}_{well})$], so as to indicate [in parallel] that here it is not [$\not\models$] a matter of perceptually tracking down and inspecting a point called the "Self" [$\mathfrak{P}_{percept}(\sigma_{self})$], but [$\models_{but}$] rather one of seizing [$\mathfrak{S}_{seize}$] upon the full disclosedness of Being-in-the-world [$\varphi_{full}(\vartheta_{disclose}(\mathfrak{B}_{in\text{-}the\text{-}world}))$] *throughout all* [$\models_{throughout} \circ \models_{all}$] the constitutive items [$\iota_{item}(\Upsilon_{const})$] which are essential to it, and doing so with understanding.

The formula system for this sentence could be

(12.4) $\tau_{transpar} \models$
$(\mathfrak{K}_{know}(\sigma_{self}) \models \sigma_{sense}(\mathfrak{U}_{well}));$
$(\tau_{transpar} \not\models \mathfrak{P}_{percept}(\sigma_{self}) \models_{but}$
$(\mathfrak{S}_{seize}(\varphi_{full}(\vartheta_{disclose}(\mathfrak{B}_{in\text{-}the\text{-}world}))$
$\models_{throughout} \circ \models_{all}$
$(\iota_{item}(\Upsilon_{const}) \models_{essen} (\tau_{transpar}, \mathfrak{U})))$

This formula is an evident case of formal abstraction and modification (symbolic simplification) of

the original sentence. However, it is still open in many respects, so additional improvements and even universalization of it can be easily performed. The reader can expect some help in understanding the German sentence which is the following: Wir wählen diesen Terminus zur Bezeichnung der wohlverstandenen »Selbsterkenntnis«, um anzuzeigen, daß es sich bei ihr nicht um das wahrnehmende Aufspüren und Beschauen eines Selbstpunktes handelt, sondern ein verstehendes Ergreifen der vollen Erschlossenheit des In-der-Welt-seins *durch* seine wesenhaften Verfassungsmomente *hindurch*. We agree that this sentence can deliver an informationally entirely different formalization to formula (12.4). □

[12.5] In existing [$\mathfrak{S}_{exist}$], entities [α] sight [$\models_{sight}$] 'themselves' [sichtet "sich" only in so far as [$\models_{so\_far}$] they have become transparent to themselves [$\tau_{transpar}(\alpha)$] with equal [$\models_{with} \circ \models_{equal}$] primordiality [$\pi_{prim}$] in those items [$\iota_{item}$] which are constitutive for their existence [$\mathfrak{S}_{exist}(\alpha)$]: their Being-alongside the world [$\mathfrak{B}_{alongside}(\mathfrak{W}_{world})$] and their Being-with Others [$\mathfrak{B}_{with}(\omega)$].

For the last sentence of this paragraph we have the following formalization:

$$(12.5) \quad (\alpha \models_{sight} \mathfrak{S}_{exist}(\alpha)) \models_{so\_far}$$
$$(\alpha \models (\tau_{transpar}(\alpha) \models_{with} \circ \models_{equal}$$
$$\pi_{prim}(\iota_{item} \models \mathfrak{S}_{exist}(\alpha)));$$
$$\mathfrak{S}_{exist}(\alpha) \models \mathfrak{B}_{alongside}(\mathfrak{W}_{world}, \mathfrak{B}_{with}(\omega)) \quad \square$$

2.13. *THE THIRTEENTH PARAGRAPH OF § 31 [BT]*

[13.1] On the other hand [in parallel], Dasein's opaqueness [$\mathfrak{O}_{opaque}(\mathfrak{D})$] [Undurchsichtigkeit] is not rooted [$\not\models_{root}$] primarily and solely in [$\models_{prim\_sol}$] 'egocentric' [ε_{ego}] self-deceptions [$\mathfrak{D}$ $\models_{decept} \mathfrak{D}$]; it is rooted [$\models_{root}$] just as much in [$\models_{just\_as\_much}$] lack of acquaintance [$\mathfrak{A}_{acquaint}$] with the world.

For the only sentence of this paragraph we have

$$(13.1) \quad \mathfrak{O}_{opaque}(\mathfrak{D}) \not\models_{root} \circ \models_{prim\_sol}$$
$$\varepsilon_{ego}(\mathfrak{D} \models_{decept} \mathfrak{D});$$
$$\mathfrak{O}_{opaque} \models_{root} \circ \models_{just\_as\_much}$$
$$\lambda_{lack}(\mathfrak{A}_{acquaint} \models_{with} \mathfrak{W}_{world})$$

There are certainly other possibilities for the formalization of Dasein's egocentric self-deceptions. □

2.14. *THE FOURTEENTH PARAGRAPH OF § 31 [BT]*

[14.1] We [one] must, to be sure [$\models_{sure}$], guard against [$\models_{guard\_against}$] a misunderstanding [$\mathfrak{U}_{mis}$] of the expression 'sight' [$\varepsilon_{express}(\sigma_{sight})$].
The formula we can propose is

$$(14.1) \quad (\mathfrak{o}_{one} \models_{guard\_against} \mathfrak{U}_{mis}(\varepsilon_{express}(\sigma_{sight})))$$
$$\Rightarrow (\mathfrak{o}_{one} \models_{sure}) \quad \square$$

[14.2] It [$\varepsilon_{express}(\sigma_{sight})$] corresponds [$\models_{corresp}$] to the "clearedness" [$\gamma_{clear}$] [Gelichtetheit] which we took as characterizing [$\models_{char}$] the disclosedness of the "there" [$\vartheta_{disclose}(\tau_{there})$].
There is, for instance,

$$(14.2) \quad \varepsilon_{express}(\sigma_{sight}) \models_{corresp}$$
$$(\gamma_{cleared} \models_{char} \vartheta_{disclose}(\tau_{there})) \quad \square$$

[14.3] 'Seeing' [$\mathfrak{S}_{see}$] does not mean just [$\not\models_{mean} \circ \models_{just}$] perceiving [$\mathfrak{P}_{perceive}$] with the bodily eyes [$\varepsilon_{eyes}(\beta_{body})$], but [in parallel] neither does it mean pure non-sensory [$\models_{pure} \circ \not\models_{sense}$] awareness of something [$\mathfrak{A}_{aware}(\alpha)$] present-at-hand [$\alpha_{present\_at\_hand}$] in its presence-at-hand [$\pi_{at\_hand}(\alpha)$].
The less or more appropriate formula system for this sentence is

$$(14.3) \quad \mathfrak{S}_{see} \not\models_{mean} \circ \models_{just} (\mathfrak{P}_{perceive} \models_{with}$$
$$\varepsilon_{eyes}(\beta_{body}));$$
$$\mathfrak{S}_{see} \not\models_{mean}$$
$$(\mathfrak{A}_{aware}(\alpha) \models_{pure} \circ \not\models_{sense}$$
$$((\alpha \models \alpha_{present\_at\_hand}) \subset \pi_{at\text{-}hand}(\alpha)))$$
$$\square$$

[14.4] In giving [$\mathfrak{o}_{one} \models_{give}$] an existential signification [σ_{sign_exist}] to "sight" [σ_{sight}], we have merely drawn upon [$\models_{draw\_upon} \circ \models_{merely}$] the peculiar feature of seeing [$\varphi_{feature}(\pi_{peculiar}(\mathfrak{S}_{see}))$], that it lets entities [α] which are accessible [$\models_{access}$] to it be encountered unconcealedly [$\models_{encounter} \circ \not\models_{conceal}$] in themselves.
Formulas corresponding to this sentence are

(14.4) $(o_{one} \models_{give} \sigma_{exist}(\sigma_{sight}))$
$\models_{draw\_upon} \circ \models_{merely}$
$\varphi_{feature}(\pi_{peculiar}(\mathfrak{S}_{see}))$;
$\alpha \models_{encounter} \circ \models_{conceal}$
$(\alpha \models_{access} \varphi_{feature}(\pi_{peculiar}(\mathfrak{S}_{see}))) \square$

[14.5] Of course, every 'sense' [σ_{sense}] does [$\models_{do}$] this [$\varphi_{(14.4)}$] within that domain of discovery which is genuinely its own [$\vartheta_{domain}(\vartheta_{discover}(\sigma_{sense}))$].

A simple formal interpretation of this sentence is

(14.5) $(\sigma_{sense} \models_{do} \varphi_{(14.4)} \subset$
$\vartheta_{domain}(\vartheta_{disclose}(\sigma_{sense})) \square$

[14.6] But from the beginning onwards the tradition of philosophy [$\beta_{begin}(\tau_{trad}(\pi_{philo}))$] has been oriented primarily towards [$\models_{orient} \circ (\models_{prim} \circ \models_{towards})$] 'seeing' as a way of access [$\mathfrak{W}_{way}(\mathfrak{A}_{access})$] to entities *and to Being*.

A formula for this sentence is

(14.6) $\beta_{begin}(\tau_{trad}(\pi_{philo}))$
$\models_{orient} \circ (\models_{prim} \circ \models_{towards})$
$(\mathfrak{S}_{see} \models_{as} (\mathfrak{W}_{way}(\mathfrak{A}_{access}) \models_{to} \alpha, \mathfrak{B})) \square$

[14.7] To keep the connection with [$\models_{connect}$] this tradition, we [o_{one}] may formalize [$\models_{formalize}$] "sight" and "seeing" enough to obtain [$\models_{enough} \circ \models_{obtain}$] therewith a universal term [τ_{term_uni}] for characterizing any access to entities or to Being, as access in general [$\mathfrak{S}_{general}$].

For the last sentence of this paragraph there is

(14.7) $\tau_{trad} \models_{connect}$
$(o_{one} \models_{formalize}$
$(\sigma_{sight}, \mathfrak{S}_{see} \models_{enough} \circ \models_{obtain}$
$(\mathfrak{S}_{term\_uni} \models_{char}$
$(\mathfrak{A}_{access} \models_{to} (\alpha, \mathfrak{B} \models_{as}$
$(\mathfrak{A}_{access} \subset \mathfrak{S}_{general}))))) \square$

2.15. *THE FIFTEENTH PARAGRAPH OF § 31 [BT]*

[15.1] By showing [$\models_{show}$] how all sight is grounded primarily in [$C_{ground} \circ C_{prim}$] understanding (the circumspection of concern [$\Upsilon_{circumsp}(\Upsilon_{concern})$] is understanding as *common sense* [$\Upsilon_{common}(\sigma_{sense})$] [*Verständigkeit*]), [$\Rightarrow$] we have

deprived [$\models_{deprive}$] pure intuition [$\pi_{pure}(\iota_{intuition})$] [Anschauen] of its priority [π_{prior}], which corresponds noetically to [$\models_{corresp} \circ \models_{noe}$] the priority of the present-at-hand in traditional ontology [$\tau_{trad}(o_{ontology})$].

The implicative formula for this sentence is

(15.1) $(o_{one} \models_{show}$
$((\sigma_{sight} C_{ground} \circ C_{prim} \mathfrak{U}),$
$(\Upsilon_{circumsp}(\Upsilon_{concern}) \models$
$(\mathfrak{U} \models_{as} \Upsilon_{comm}(\sigma_{sense})))) \Rightarrow$
$((o_{one} \models_{deprive} (\pi_{pure}(\iota_{intuition} \models_{of}$
$\pi_{prior}(\pi_{pure}(\iota_{intuition})))) \models_{corresp} \circ \models_{noe}$
$\pi_{prior}(\pi_{at\_hand} \subset \tau_{trad}(o_{ontology})) \square$

[15.2] 'Intuition' and 'thinking' [$\mathfrak{T}_{think}$] are both derivatives of understanding [$\vartheta_{derive\_remote}$], and already rather remote ones.

A simple formula is

(15.2) $\iota_{intuition}, \mathfrak{T}_{think} \models_{already}$
$\vartheta_{derive\_remote}(\mathfrak{U}) \square$

[15.3] Even the phenomenological [$\varphi_{phenomenal}$] 'intuition of essences' [$\iota_{intuition}(\mathfrak{e}_{essence})$] ["Wesenschau"] is grounded in [C_{ground}] existential understanding [$\mathfrak{U}_{exist}$].

An adequate formula for this sentence is

(15.3) $\varphi_{phenomenal}(\iota_{intuition}(\mathfrak{e}_{essence}))$
$C_{ground} \mathfrak{U}_{exist} \square$

[15.4] We can decide about [$\models_{decide}$] this kind of seeing [$\mathfrak{K}(\mathfrak{S}_{see})$] only if we have obtained explicit conceptions of Being [$\Upsilon_{concept\_ex}(\mathfrak{B})$] and of the structure of Being [$\sigma_{structure}(\mathfrak{B})$], such as only phenomena in the phenomenological sense can become [$\lambda_{logic}(\varphi_{phenomenal})$].

The implicative case of formalization of this sentence is

(15.4) $(\Upsilon_{concept\_ex}(\mathfrak{B}), \sigma_{structure}(\mathfrak{B}) \models_{as}$
$\lambda_{logic}(\varphi_{phenomenal})) \Rightarrow$
$(o_{one} \models_{decide} \mathfrak{K}(\mathfrak{S}_{see}(\mathfrak{B})))$

The last formula is a formal generalization which pertains to the entire realm of the Heideggerian Being. $\square$

(Will be continued)