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ON SEMIOTIC CONVENTIONS

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The considerations I shall present in this article are part of a bigger dissertation on conventions in different areas of culture.

In the introduction to the dissertation I differentiate a few senses of the word "convention" and I need to shortly give these senses here, since I shall further refer to them in the course of argumentation. Generally speaking, there are three senses of the term "convention" which could refer to a convention in the sense of agreement, in the sense of decision and in the sense of usus — however, within each of these senses I differentiate the aspect of activity and the aspect of a product or result of a particular activity. Let's add that it is clear that not every agreement, or decision, or usus is of a conventional nature, only certain specified subsets of these. Thus K — I — a is a convention understood as an activity of legally bound persons, which consists in: 1° overcoming real or potential disagreements on a certain matter between principals of these persons, and 2° reaching a mutual agreement by principals under specific conditions (and, in certain situations, the legally bound person and the principal can be the same subject of activity). K — I — b is a product of K — I — a in the form of a verbal text which gives the content of the reached agreement and its conditions.

K — II — b is a decision about a chosen indicator or a class of indicators I which constitute a certain system (order of relation) within the scope of products of a sign nature that belong to the universe of culture objects.

K — II — b is the indicator chosen by means of this decision. It can be a postulate, a definition, a system of axioms, a rule of behavior, a literary or artistic canon, etc.

K — III — a is a certain usus, a stereotypical way of being which is not an instinctive behavior but rather is aimed at communicating a certain semantic content determined by a directive of the type *K — II — b* or an agreement *K — I — b*, even if the persons maintaining the usus do not realize there is the convention conditioning it. *K — III — b* are conventionalized signs of *K — III — a* (social conventions, conventional clothes, decorations, etc.).

The area in which conventions — in each of the three mentioned senses of the word "convention" — play an important role is *ex definitione* the area of signs of different types. Moreover, it is possible to claim that the notion of a convention is characteristic of this area, and that it is exactly because of the prevalence of sign systems and meanings in the world of culture that this notion necessarily permeates through this whole world.

According to the previously mentioned characteristics, human speech considered as people's NATURAL, spontaneous way of behaving in order to reveal their own spiritual states, to communicate with others, to affect others and interact with them, to elaborate on and maintain knowledge about the reality, is not an example of a convention in the sense of *K — III*, for it does not meet the second condition — it is not only about communicating certain contents determined by directives of the type *K — II — b* or agreements *K — I — b*. This is not contradictory to the fact that language considered as a system of signs and the rules of using them is a result of a convention of the type *K — II — a*, while the rules themselves may be in the nature of a convention *K — II — b*. It especially applies to artificial, formal languages and certain aspects of natural language.

However, not all signs — in a certain understanding of the term — are of conventional nature. It especially applies to the area of signs which are customarily called "oznaki" [indicates] in Polish terminology.

The notion of an indicate, variously understood and defined, can be reduced to the notion of an ordered set *U*, such that $U = F\{(a \rightarrow b)$ for $S\}$ when *S* is a conscious subject, *a* is a certain state of affairs which is available for perception — such that can be regarded by *S* as an indicator of another state of affairs, namely *b*. A particular *a* indicates *b* for *S* if and only if *S* seeing *a* can accept *b* on account of the fact that *a* and *b* are in a unique ordering relation. This ordering relation can be founded ontically (e.g. when *a* determines *b* causally) or on the basis of convention. In the latter case the role of convention can be twofold. It consists in providing an indicator *a* with certain sign elements accepted conventionally, and a state of affair *a* is founded as an indicator through either a real (function

or causal) relation with a state of affairs b, or the relation is an ordering relation assigning states of affairs only on the basis of a convention. Then the choice of an indicator a needs not be pragmatically motivated and can be of arbitrary nature. Let's call indicates of the first type — SYMPTOMS, while of the second type — SIGNALS.

A conventional indicate often owes its nature to the fact that it is a state of affairs in which what is perceived is a certain symbol. Hanging a black flag on the building of a university is an indicate that an employee of the institution has died; while the black flag itself is a symbol of mourning. Putting ash on the head is an indicate of penance, while ash in this situational context is a symbol of transience of earthly life. Sometimes just a behavior or an activity that operates with a symbol is called a symbol; however, it is better to call it "symbolic," restricting the term "symbol" to things and not states of affairs or processes which are indicates by nature. Even in this restriction the word "symbol" is used to refer to signs that belong to various areas of life. There are logical and mathematical symbols in science, quality symbols in technology and industry, religious symbols, symbols in poetry and art. The sign "=" is a symbol of an equality relation in mathematics, and the letter "p" is a symbol of a sentence in the propositional calculus. Number one is a symbol of truth in the Boolean algebra, and can be a symbol of good quality of goods in technology. However, it is also said that the Cross of Lorraine became the symbol of the Resistance in France, while a skeleton with a scythe has been a symbol of death for ages; a trowel is a symbol of freemasonry, etc. What all these objects have in common is that they were constructed or chosen to have a certain specific semantic function, that is, the function of indicating which was assigned to them on the basis of a convention. The difference between the objects is twofold. One, consists in that some of these signs, except for the semantic function of symbolizing assigned by a convention, present something itself or represent something on another basis (a drawn cross is an image of a real cross, a sculpted skeleton — of a real skeleton, etc.), whereas other signs do not have another semantic reference except for the convention which assigns their semantic function (a piece of black material, equality sign, etc.). The other difference is related to what can be called their value-creating content. There are emotionally neutral symbols, introduced in order to improve certain cognitive operations, to communicate information better, to reason more easily, etc., and such that were used to designate objects and at the same time to signal certain values and evoke appropriate axiological feelings. Well, sometimes the name "symbol" is only reserved to the latter type of conventional signs. This is

what semantic conventions in poetry, art, or religion are aimed at. This issue is addressed in one of the later chapters of the dissertation mentioned at the beginning of this article. What is meant here is to differentiate between symbol and signal, and to point out the conventional nature of symbols. Let's add, in order to avoid misunderstandings, that the two proposed classifications of symbols intersect, that is, a neutral or axiological nature of semantic content of a sign is not related to a type of objects which function as symbols, but to a type of their pragmatic use which is assigned by the nature of objects designated by them.

Because symbols, except for a semantic reference determined by a convention, sometimes also present through their content, different from physical materials, certain intentional objects they can be in principle understood twofold: either as signs presenting the intentional object X, or as signs representing (in the sense of a symbol) another object Y through X or its properties. Thus, for example, the bottom part of the central section of van der Weyden's *Last Judgement* triptych can present, through its content, certain intentional objects: a young woman who is holding a balance scale on whose pans there are naked kneeling figures. Or can force the audience, because of its certain properties and the name *Last Judgement*, to interpret this intentional object (a woman with a balance scale) as a SYMBOL of justice. Using the sign in the latter function, that is in the function of a symbol, is conditioned by the familiarity with the convention the sign assumes. This familiarity is so common in certain cultural spheres that a sign immediately, so to speak naturally, imposes itself as a symbol; sometimes, however, the unfamiliarity with the convention adopted in certain cultural spheres makes it impossible to understand the sign in this way — as a result the sign is completely incomprehensible or is understood incompletely, i.e. only the direct content it presents is understood. For example, when somebody unaware of its symbolic meaning recognizes the emblem of freemasonry as an image of a trowel, and not as a symbol of the organization. Independently from this duality, signs operating as symbols can be ambiguous if different conventions are assigned to different objects (the Cross of Lorraine as the symbol of The Duchy of Lorraine, as the symbol of the Resistance, as the symbol of the Society Against Tuberculosis [Towarzystwo Walki z Gruźlicą]; ">" as a sign of a greater-than relation and as a symbol of a set inclusion; a balance scale as a symbol of justice and as a symbol of a star constellation, etc.).

Objects which are images of other objects are not *eo ipso* signs of these objects. A portrait of Napoleon in a coronation costume is no sign. Despite

the critics of Edouard Manet, the portrait of Olympia is not a symbol of perversion. In order for an image to be a sign of something, it needs to be assigned, through a convention, to a class of objects which it should indicate or stand for.

Even if it is a sign of an individual object, it indicates either through denoting the set which the object belongs to, or through indicating the singleton set of which the object is the only element. The former case takes place when, for example, a schematic city map shows an image of a train to indicate the location of the railway station; the latter — when, for example, an image of an arrow or a centaur holding a bow is the zodiac sign of the Sagittarius constellation. Even the most similar images become signs of the depicted objects only when they acquire the function of indicating, standing for or symbolizing. Claiming that many words in natural languages are created on the basis of imitating sounds which are naturally associated with the objects which the words designate, does not violate the thesis on conventional (though not arbitrary) assigning of names to their designates. Thus, I seem to disagree with the not uncommon opinion that sculptures, paintings, or even schematic models (maps or charts), which show certain objects, are included to natural signs and opposed to conventional signs, such as symbols, on this basis that the former are similar to the objects they present, and the latter have this function only through a convention. For a mere similarity between objects A and B does not make one of them a sign of the other. That A is a sign of B for X depends on assigning A with a certain function in relation to B, and as such the assigning of the function involves a certain decision, agreement or usus. Creating certain objects that represent other objects can be aimed at either presenting or indicating, in order to show certain properties of presented objects (this function is present in portraits, schematic models, maps, iconic symbols), or presenting the concept (this signitive function is present in mathematical symbols, words of speech).

Presenting in order to show often, though not always, operates with objects which are similar in some regards to the presented objects. This could be an intuitive similarity between the image and the thing presented in the image, or an isomorphism or homomorphism of the model and the object which resembles the model. And it is exactly this similarity that can naturally motivate the semiotic convention that assigns object A with a function of presenting object B. Thus, in this sense and only in this sense, iconic signs can be called natural signs, and not in the sense that they failed to become signs of other objects through an appropriate convention. For the

fact that certain objects resemble other objects on the basis of similarity does not make them — as mentioned earlier — signs of these objects. (When I assert that Peter resembles his twin brother Paul, or that a rock near Ojców is similar to Hercules' club I make the first element of the similarity relation neither a sign nor a representative of the other). In order for object *A* to be an indicating sign of object *B*, it needs to be provided with the semantic function of "indicating" or "mapping," it needs to be created or assigned and interpreted to this end. When two portraits of the same person are compared: one painted in the naturalistic convention, the other — in the cubist or expressionist convention, accepting that the two portraits indicate a real person, and regarding them as sign products, in both cases is a result of a certain convention. I can analyze the world of the objects presented in a piece of art without going beyond the piece of art and beyond this intentional world, without using them to reach to alleged real or ideal beings, which supposedly represent the intentional objects of the piece of art. People depicted in a painting live in their own imaginative world and the viewer can focus their spontaneous intention on them. Reaching for objects of the real or ideal world, as if through these intentional objects, involves modifying their strictly esthetic function accompanied by classifying them as semic objects. The image acquires the function of a complex expression, it is a system of signs that designate something beyond themselves; becomes something like a complex description. Similarly to an account of a certain states of affairs which is not a result of a convention when it maps a certain reality — even though the expressions used to describe this reality contain elements (words) that designate objects on the basis of semiotic convention — and, similarly to a map, which informs about properties of a certain fragment of the globe on the basis of mapping, although the map's signs are assigned to certain properties and components of the mapped area on the basis of semiotic convention while the spatial relationships are characterized in a certain metric convention, then also an image, interpreted as a representative of a certain real object, presents or maps the object not on the basis of resemblance, but on the basis of the convention adopted by the artist and the viewer. That this is indeed the case is confirmed by the method of creating historical paintings that represent people of the past, which makes use of models. Jan Matejko's paintings are full of portraits of his contemporaries, but characters presented in the paintings do not represent them at all. Looking at *Prussian Homage*, the viewer — who does not limit themselves to purely esthetic contemplation of intentional objects — "recognizes" Stańczyk in the character wearing a jester cap and sitting next to the throne, and not Józef Szujski whom

the character very much resembled. For who is represented by a particular character in the painting is established by the convention the painter adopts or suggests (sometimes by means of the name given to the painting). The above can be summed up as follows: the fact that signs can resemble the signified that they present, and that this resemblance is taken into account when choosing or creating a sign, does not change the conventional nature of signs. Signs of picture writing, although genetically related to a natural tendency to operate with analogous things, are no less conventional than letters of the Latin alphabet when they are used — as verbal signs which they replace — to create words assigned to certain objects. This also concerns the so called onomatopoeias in spoken language in comparison with words devoid of this element of resemblance. Even if it were accepted that the word "rustle" presents or reconstructs (in order to show) the phenomenon of rustling[1], it does not follow that any verbal imitation of a natural phenomenon would be an element of the system of a language such as Polish, English, etc. by the mere fact of mutual resemblance. It is the usus or decision (thus a convention) that decides upon the assignment of this function.

Aren't the above arguments about the conventional nature of linguistic and iconic signs contradictory to the thesis, presented at the beginning, about the natural character of certain indicates? I do not think they are. By "indicate" I mean a certain state of affairs which allows the cognitive subject to infer another state of affairs which is related to the former. Such a state of affairs either can appear spontaneously in the world of nature and be regarded as an indicator of another state of affairs, or can be deliberately created in order to indicate someone else's different state of affairs. The role of convention in creating indicates of this type consists of including certain symbols in the state of affairs which indicates the appearance of another state of affairs.

Using indicates of this type involves familiarity with the convention that establishes the function of the symbol whose appearance becomes a signal.

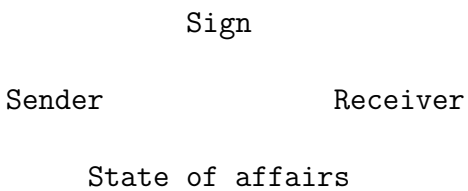
The above considerations and analyses demonstrate a certain crucial ambiguity of the word "sign". Sometimes its understanding is very broad. A sign, in this broad understanding, let's call it S (I), is any object that is perceived by somebody who can associate it with another object, and that is in the relation of indicating or denoting with the other object. A sign in this understanding can be both a certain state of affairs or a process (an indicate), as well as certain things (symbols, iconic signs) that

[1]This is L. Blaustein's approach (1931: 106).

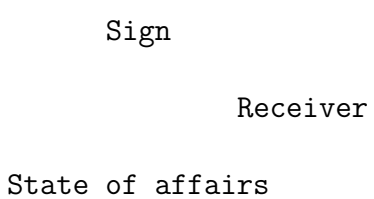
designate some objects. Things of this type are very often simply called "signs," and this is what determines the other sense of the word. Signs in this other understanding, let's call them Z (II) are usually, though not always, products of a convention, thanks to which indicates (which are such signs) also indirectly have a conventional nature. Independent of convention are only those indicates that we called symptoms. Whether their denotative components can be called signs in the sense of Z (II) will be discussed in a moment.

In order to avoid misunderstandings, it would be advisable to eliminate the use of the word "sign" either in the first or the second mentioned sense. If the term was to be kept in its most general meaning, then understood signs Z (I) would thus divide into denotative signs and informative signs. Denotative signs (that is, various individual gestures, sounds, symbols), considered separately are more or less indeterminate (or — as Frege said — unsaturated); only in a certain arrangement (that is, in situational or verbal contexts) do they fully activate their function of denoting. The arrangements (that is, signals, maps, sentences, etc.) can be called informative signs.

Both groups of signs include conventional and unconventional signs. Conventional denotative signs are conventional gestures, iconic signs, symbols. Unconventional denotative signs are material elements of certain symptoms (let's call them indications). In reality — and this is what distinguishes them from conventional denotative signs — when separated from the situational context of the information they do not denote anything. The set of unconventional denotative signs is unlimited, as is their indeterminacy. A tear as an element of the indicate called cry, in separation from the situational context, is only a drop of a salty liquid; similarly a sound or color separated from the whole of the symptom does not denote anything. The notion of a denotative sign is relative to a certain function. Thus, what can become an unconventional denotative sign is any object if it appears as a signifying element of the information. By "informative" I mean signs which indicate the occurrence of certain processes or states of affairs, or postulate occurring certain processes (e.g. human behavior) or states of affairs. Informative signs can be designed or undesigned. The former requires a tetradic relation:



While the latter requires triadic relation:



I call designed informative signs — messages. Let's add that by a sender I mean both a conscious subject who directly communicates something, and a technical device created or designed by a conscious subject to aid communication. Also a receiver can be either a conscious subject or a machine which registers or processes the information for the subject. What belongs to the tetradic group of informative signs are: signals, linguistic utterances, models, mimic expressions, etc. What belongs to the triadic informative signs are symptoms. Sometimes, however, a triadic relation of an informative sign can transform into a tetradic relation of a message, when a symptom is a state of affairs or a process which occurs in the subject who wants to make this state of affairs available (as a sign) to the receiver. This is the case for symptoms of a mental life which are used to express states of the sender in order to communicate them to the receiver. Somebody's cry, a symptom of sorrow, can transform into a designed informative sign if the crying person intends to communicate somebody the information about their internal state. It is also possible that the message will not be received as such — not because of the lack of a receiver, but because the receiver will regard the message as a symptom; for example, a radio text in a foreign language not clearly transmitted enough can be regarded by an inattentive radio listener as noises which accompany either some damage to the device, or the initiating of a jamming signal.

However, another — and sometimes adopted — conception of a sign is possible. In this conception the indicates understood as symptoms (thus, as undesigned information) are not regarded as signs. In this narrower understanding, in order to be a sign, something needs to be either addressed, designed information, or the information's possible denotative component (sentence — word, mimic expression — individual gesture). However, also in this understanding the talking about of conventional and unconventional signs is possible. The latter would appear in the case of the spontaneous communicating of information by means of expressive behavior (e.g. when a

baby calls the mother by moving rapidly and crying, or shows the desired object, or when a dog behaves so as to attract attention of its master). These natural, i.e. spontaneous, *ad hoc* created and communicated signs sometimes become the input of a certain sign convention. For when in a certain social group the usus (thus a convention in the sense K — *III* — a) accepts raising spread hands as a sign of begging, or somebody's decision (a convention in the sense K — *II* — a) incorporates the gesture of crossing arms on the chest to mimic the code of a certain ceremony, the sign acquires a certain specific content that is assigned to the sign on the basis of the semantic convention (K — *II* — b). Perhaps only then it would be right to regard the sign as an informative sign.

And one more remark aimed at avoiding potential misunderstandings. By calling a symbol a denotative sign and by highlighting whether object O is a symbol depends on its having the semantic function, I claimed that objects have this function on the basis of convention. It is so if a denotative sign is considered on the grounds of the system of information, that is, as an element of an informative sign or a message. However, the situation is different in the case of subjective operations of cognitive perspective on the world, in the case of existential experiences of reality and in the case of pure expression. In these situations, which are not aimed at communicating information, sometimes symbols are also present. It is said that there can be symbolism in night dreams, symbolic perspective on the world, symbols in deep feelings, symbolic nature of poetry, myths symbolizing certain truths, etc. Object O in this understanding is a symbol when, through its own properties, it reveals and shows to subject S a certain existential area that is especially valuable in the subject's individual experience. Thus understood the symbol acquires the semantic function not on the basis of convention but on the basis of metaphor. And mutuality or similarity of certain human experiences results in that symbols thus understood may appear spontaneously in subjective operations of many individuals, or — when shared by individuals — become intuitively understandable for them, and thus unanimously interpreted. However, symbols can be hermetic, so exclusively related to somebody's unique experience, that even when shared they will be misunderstood and unclear, or even approached literally instead of metaphorically, so that they will lose their symbolic nature of reference. Thus understood symbols that designate on the basis of metaphor, when incorporated into the system of information, very often lose their spontaneous nature, become conventionalized (on the basis of convention K — *III* — a). What takes place then is a phenomenon that can be called trivialization whose

origins — as was recently shown in an interesting book by L. Jerphagnon (1965) — lie in an elementary duality of human duration, that is: a subject's individual duration which reflects the subject's deep Self, and co-duration with others, e.g. while mutual communication by means of signs created or stabilized by convention. The process of trivialization, which is a result of duration with others in shared time, is very often felt negatively from the perspective of individual duration. Hence, numerous attempts to escape from triviality or to overcome triviality are visible among others in searching for new forms of expression in literature and art, in searching for new metaphoric, as opposed to conventionalized, symbolism. However, such attempts lead in turn, on the grounds of information systems, to acceptance or rejection of new semiotic conventions, which inevitably cause this symbolism to be trivialized.

The above mentioned simple examples of spontaneous expression, as well as pointing out the facts of metaphoric creation of symbolism in existential experience and the facts of existence of the spontaneous function of communicating information, and therefore of creation so to speak $\varphi\acute{\upsilon}\sigma\epsilon\iota$, which is by nature a usus-like, mimic or verbal code, do not contradict the conventional nature of various signs and sign systems. The natural, in this sense characteristic (of man as a creature conscious of living among others), need and function of communicating and affecting others requires creating and improving the instrumental means used for the aims of this function. And indeed these means are created, chosen or established by the subject conscious of these aims. These are, among others, means able to distinguish, name and communicate certain states of affairs (occurring both in the world and in the subject) to others, and means able to preform states of affairs which have not occurred yet, but which are postulated. These means are a result of different types of semiotic conventions. I tried to show that it is indeed so in the present article.

Bibliography

1. Blaustein, Leopold (1931) *Przedstawienie schematyczne i symboliczne. Badania z pogranicza psychologii i estetyki.* Lwów: Przegląd Humanistyczny.

2. Jerphagnon, Lucien (1965) *De la banalité. Essai sur l'ipséité et sa durée vécue: durée personnelle et co-durée.* Paris: J. Vrin.

Andrzej Bogusławski
ON SEMANTIC ANALYSIS

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Loosely speaking, semantics is supposed to deal with meaning — the sense of expressions. Sense, in turn, according to the most general understanding of the word, falls under the concept of connection, relation. Hence it is clear that semantic analysis should consist in revealing, in one way or another, the relations that hold between expressions. Some relations can be brought out by drawing attention to certain objects while uttering such and such expressions at the same time; in this way we 'ostensively', or 'deictically', learn the sense of the expression, or rather some aspect of its sense. Without this aspect of their connections, expressions could be useful for nothing but games.

Yet apart from such connections there are relations between expressions themselves. Some of them are associated with relation to objects, in that they mirror, as it were, the connections between expressions and objects. This is precisely the domain of semantics. Clearly then, in semantics, the fundamental formula or schema of an expression must take the form of a RELATION between two expressions that holds by virtue of their reference to the objects besides them. But the most general, most basic and most commonly used schema of relation is implication, that is, the expression *if*..., *then*..., or symbolically: $p \rightarrow q$. This schema, therefore, suggests itself as the primary tool of semantics.

And indeed, a phrase such as *If something is a dog, then it is an animal* can be regarded as a suitable and natural way of presenting a particular semantic property of the word *dog*, *viz.* its relation to the word *animal* (alternative formulations would include *All dogs are animals* and *The word "dog" denotes an animal species*).

This, however, leads to a fundamental difficulty. The point is that, the sentence *If something is a dog, it is an animal*, according to the NORMAL UNDERSTANDING of the words involved, cannot be contrasted with the sentence *It is not the case that if something is a dog, then it is an animal* as describing a conceivable situation. And it is only such contrast that allows us to understand expressions.

It is also in light of this opposition that we usually account for implication, e.g. *If Peter was at the meeting, then he knows who has been chosen*, *The one who asks doesn't get lost* (*If you ask, you won't get lost*), *If something is a living being, then it came to existence from a similar living being* (the contrary would be the thesis about autogeny), etc.

Implications such as the examples given above cannot, and usually do not, aspire to the role of semantic statements. Such a role can only be played by implications of the previous kind. Yet telling those implications apart is not always an easy task, and, more importantly, we do not always care about the distinction. So, for instance, the example about a living being can raise serious doubts and — on a less critical approach — could deserve the title of a semantic statement. The reason for such confusion is the uniformity of the external form of those implications, though in fact they are quite different.

That is why in a correct semantic analysis we should go beyond the general concept of implication; there is only room for analytic implication, like in logic, whereas synthetic sentences and further implications based on them should belong to science and ordinary knowledge or opinions.

Thus it is necessary to describe the nature of implication and its various kinds in a more precise way; we need their semantic interpretation. We have to do here with a typical case of 'building a ship in the sea': semantic analysis as a tool for making tools for semantic analysis. Nevertheless, there is no other way out, and given sufficiently clear and certain basic claims, there should be no danger of internal conflict within the whole.

The first thing we assume is the postulate that it is a necessary component of a COMPLETE interpretation (understanding) of an (minimal) utterance that it be referred to some object, a fragment of reality, a part of the world, i.e., that it should pick out such a part and draw one's attention to it in connection with the utterance. It must be emphasized that we are talking about an object in the extensional sense, a part or 'portion' or reality, i.e., an object in the ordinary sense (yet including living creatures, as well as concrete sets). The notion of object as an 'object of thought', 'object in the abstract sense', which is supposed to include — in addition to normal objects — creations of imagination (e.g. fictional characters), properties, actions, psy-

chological states, etc. lacks the known (operational) criteria of application of the ordinary term *object* and is intended as something that would correspond to some mean, as it were, between those criteria and the lack of them. But this is a total nothingness, like something which is supposed to be neither white, nor not white, and to keep a bit of both properties at the same time. We reject such a notion of object. The claim that by endorsing the ordinary understanding of *object*, we encroach on the field of ontological discussion, allegedly alien to semantics, is based on a misconception. In fact, we just wish to use terms with well-known applications, in order to avoid creating some special semantic metaphysics. And the term *object* is absolutely crucial in SEMANTIC analysis.

Still, the application of the above postulate to implication by referring it to a particular object is fraught with difficulties. And yet implications, or at least those not involving fictional characters etc., that is, implications that are regularly communicative, above all those occurring in science, should have their concrete object — an object which could be referred to not only by the speaker, but also by the hearer.

There is only one way out of this situation: we need to assume that, in general, it is the expressions themselves that constitute the object talked about in a given implication; expressions taken not as bare sounds or inscriptions, but as sounds or inscriptions understood in a certain way, so not in *suppositio materialis* in the narrower sense, but in a supposition that could be called, following William Ockham (after a slight change of its extension), *suppositio simplex*.

We interpret the basic type of synthetic implication by making use of the well-known matrix of truth values. We will regard the distinguished configuration ($V\ F$ — F) as the proper characterization used in an implicational sentence and applied to sentences in *suppositio simplex*. So we will accept the predicate *untrue* in the case of conjunction of the antecedent and the contradictory of the consequent, taken as a set of expressions-objects. In order to bring out the difference between implication and simple negation of conjunction, in the case of implication we introduce a hierarchy of expressions-objects.

By marking an expression-object with brackets ( ), and a relevant set with { }, we will replace the ordinary implicational formula with the following formula of a more fundamental type:[2]

[2]Translator's note: the variable with a bar over the letter q stands either for the contradictory of q, or — less plausibly — for (q) *untrue* (accordingly, some minor modifications were necessary in the following formulas).

(1) $p \Rightarrow q = (p)$: $\{(p), (\bar{q})\}$ untrue; cf. $\sim (p \wedge \sim \bar{q}) = \{(p), (q)\}$

Examples:

If it rains (p), then it will be wet (q) = (p): $\{(p), (\bar{q})\}$ *untrue*;

It will be wet (q), if it rains (p) = (q): $\{(q), (p)\}$ untrue;

We will interpret general sentences in an analogous way, so that the sentence *Whoever asks doesn't get lost* will be rendered in the following manner:

(2) (xpy): $\{(xpy), (xq)\}$ untrue

where p corresponds to *asks*, and q to *gets lost*.

The latter interpretation, however, requires some clarifications. The first one concerns the term *untrue* next to expressions not referring to any concrete object: we usually speak of truth when we are talking about a sentence or sentences 'attached' to some object. Here, the application of the predicate *untrue* stems from the belief that this predicate carries the information of ABNORMALITY OF USING A PREDICATE (PREDICATES) OR ITS (THEIR) NEGATION in an expression-object; such an expression can either contain indexes referring to particular objects or fail to do so. Their absence (if there are no other descriptions limiting the reference of a predicate) amounts to a 'generalized' use of a predicate. Still, the affirmative or negative use of a predicate is enough for applying the metapredicate *untrue*. The metapredicate *untrue* has its contextual version — *does not exist*; it is applied to expressions-objects and to sets of expressions without the hierarchy made explicit in the notation introduced above; e.g. *Fairies don't exist* = (*x fairy*) *untrue*, *There are no people who ask and get lost* = $\{(xpy),(xq)\}$ *untrue*. We interpret the corresponding existential sentences with *exists* as a metapredicate *untrue* next to expressions-objects of the type (*p untrue*), where p is substituted with the expressions from the sentences about 'nonexistence'.

The second comment concerns variables x, y, etc. Contrary to appearances, they should not be regarded as distinct components of a semantic structure. Reference to an object is an integral property of a predicate (a property that can, but need not, be — wholly or partially — indicated and/or actualized by the hearer), while the object can be a concrete particular or a set with given cardinality. In other words, a predicate is in itself either monadic or binary, ternary, etc., and these argument-slots have their particular features. All this is inherent in the predicate. The expression *traded*, normally understood, is no different from the expression *Someone traded something for something else with someone* (unless it has been used with such and such concrete objects in mind). This situation can be com-

pared to the case of a pipe: its wall does not exist in it separately from the hollow space or from the inlet and outlet. Just as you cannot have a pipe without an inlet or vice versa, so you cannot have the verb *to trade* as such without one of its four 'slots'. So if symbols of variables are used to denote possible arguments of a relation, it is not done in order to mark some mysterious, distinct semantic parameters (there are no such things in language), but to specify important properties of a predicate (which, in part, constitute the predicate) and, even more importantly, to mark the identity or nonidentity of the arguments which could fill in the respective slots. For it is an empirical fact that language allows for determining the identity—nonidentity of arguments despite the failure to indicate the objects the predicate refers to, or despite taking the predicate in *suppositio simplex*, without thinking of any object. This is the case of *Whoever asks doesn't get lost*, where the lack of object arguments does not get in the way of the clear understanding that we have a unique, hypothetical object in mind. This significant feature of the language needs to be modelled somehow: x, y, ... are a convenient device in this case (as long as one keeps in mind that they do not stand NEXT TO p, q, etc., but are inseparable from p, q, etc. — they, so to speak, inhere in them).

Let us now move to the kind of implication which can be plausibly considered semantic, e.g. *Dogs are animals*, and more precisely — *If something is a dog, then it is an animal*. By transforming this implication into the primary form that has just been presented, we get:

$$(3)\ \ (x\ is\ a\ dog) : \{(x\ is\ a\ dog)\,,\ ((x\ is\ an\ animal)\ \ untrue)\}\ \ untrue.$$

This formulation gives rise to a major difficulty. Namely, the opposite formulation would be:

$$(x\ is\ a\ dog) : \{(x\ is\ a\ dog)\,,\ ((x\ is\ an\ animal)\ \ untrue)\}\ \ true.$$

That is to say, *If something is a dog, then it is not an animal*, on the normal understanding of the terms involved is a contradiction in the strictest sense, since, on the normal understanding of the words used here, this sentence entails that it is possible to be an animal and a non-animal at the same time. But if we agree that we understand all sentences only by way of opposition between predicates and their negations, i.e., as a choice between these two alternatives, then we will be forced to regard (3) as

meaningless. It is so because falsity can be predicated only if one knows what the corresponding hypothetical truth would consist in, and that cannot be said about contradiction or about something which involves a contradiction. The point is that truth is the correct or normal choice of an affirmation and/or negation, whereas such correctness cannot be attributed or denied if both the affirmation and the negation can be applied to the same thing, that is, if no choice has been made between them. Sentence (3) does not say that there are no 'dogs—non-animals', because in order to claim that, it would be necessary to understand this description, in the same way in which we understand, say, the description *centaur*. Sentence (3) does not say that dogs-non-animals is a description that lacks reference, but rather that it is not a description at all. Accordingly, it is impossible to deny that the sentence *If something is a dog, then it is an animal* has a perfectly definite sense and, in fact, it is true. Consequently, since — on the one hand — it is necessary to acknowledge what has been said above about the peculiarity of the sentence in question, and — on the other — to count this sentence as meaningful and true, we must choose a special interpretation for it, which differs from the one we have just tried and which meets the requirements that have been specified as a result of this attempt with respect to the affirmation—negation opposition.

In such an interpretation a crucial role should be played by the notion of contradiction. It not only follows from the observations suggested by considering the previous example. It is also made clear by the following truism: if an expression has a meaning, then the reverse of that expression, obtained simply by changing the affirmation into negation or the negation into affirmation, is in contradiction to it, while expressions which differ in meaning are not automatically contradictory, even if they also differ with respect to affirmation—negation; in fact, it is all the more so when they differ in this way (cf. *black* — African-American, and *not black* — about colour; *is a dog* and *is not a cat*). By reversing this observation, we draw the conclusion that the presence of (even indirect) contradiction between expressions that are opposite with respect to affirmation—negation must reflect the fact that one of them represents at least such and such semantic properties of the other, and in some cases they would just have the same meaning (disregarding the affirmation—negation difference).

However, we cannot be dealing here with a straightforward, strict contradiction, because the latter is a relation between expressions that differ exclusively with respect to affirmation—negation, which in addition are declarative in character, e.g. (*A*) *is asleep* — (*A*) ((*A*) *is asleep*) *untrue*,

while we are concerned not so much with substitutions of the so-called logical truths as with relations between expressions differing in form — including both declarative and non-declarative ones.

Apparently, a proper rendering of implication that holds in the case of expressions whose meanings overlap or one of which represents some part of the meaning of the other, can take the following form:

$$(E_1) : \{(E_1), (E_2)\} : \textit{ if } x \textit{ knows and is ready to use } (E_1), (E_2),$$

$$\textit{then } x \textit{ is ready to use } (E_1), \textit{given that } x \textit{ is not ready to use } (\bar{E}_2).$$

In this formulation, (E) stands for an expression in *suppositio simplex* with an implicit or explicit indication of the 'code' it belongs to (e.g. the English language), and x — for an arbitrary person at a particular moment together with all pertinent circumstances, the same in all applications of x in the formula. The bar over E_2 signals the change from affirmation to negation or vice versa. The substitutions of E_1 and E_2 could be, e.g., *dog* and *animal*, respectively.

An example of a pair of expressions that cannot be substituted for E_1 and E_2 is: *dog* and *quadruped*; a dog with three legs would be, like a calf with two heads from old reports, an oddity of nature, not of semantics.

The association of the relation between E_1 and $\bar{E}_2$ with contradiction in the discussed formula is revealed by the fact that readiness to use $\bar{E}_2$ leads to the *lack* of readiness to use E_1, and this lack is already in direct contradiction to readiness to use E_1 (just as readiness to use $\bar{E}$ rules out readiness to use E).

We can introduce here a set of relations potentially inherent in this schema, followed by suitable terminological conventions.

The relation E_1—E_2 — semantic CONDITIONING, e.g. *dog* — *animal*, *dog* — *not cat*; in the case of identity with respect to affirmation—negation — COMPATIBILITY, e.g. *dog* — *animal*, otherwise — ALTERNATION; E_1 is a semantically conditioned expression, with respect to E_2, while E_2 is a semantically conditioning expression, with respect to E_1; in the case of symmetry of the relation between E_1 and E_2, i.e., if E_2—E_1 is an analogous relation, we could speak of TRANSFORMATION, e.g. *a is longer than b* — *b is shorter than a*, and the arguments of the relation of transformation could be called mutual transforms; a transformation preserving the object

reference is SYNONYMY, e.g. *a married b — a got married to b* (as opposed to non-synonymous transformation, e.g. *a married b — b married a; b got married to a*: in the two latter cases we were talking about *b* instead of *a*).

The relation E_1—$\bar{E}_2$ — semantic INTOLERANCE, e.g. *dog — not animal*, *dog — cat*; in the case of opposition with respect to affirmation—negation — INCOMPATIBILITY or exclusion, e.g. *dog — non-animal*, otherwise — COMPETITION, e.g. *dog — cat*; if E_2 in $\bar{E}_2$is a transform of E_1, the relation E_1—$\bar{E}_2$ could be called ANTI-TRANSFORMATION, and if E_2 in $\bar{E}_2$is synonymous with E_1, the relation E_1—$\bar{E}_2$ could be called (derivative) OPPOSITION or contradiction.

In addition, we need to consider a situation in which E, due to certain properties, lacks its strict counterpart $\bar{E}$. Such an expression can only appear as E_1 (and not as E_2) in the schema. Nevertheless, in some cases it can strongly resemble E_1 from its transformation (or mutual incompatibility). Such a situation takes place when apart from the E_2 that semantically conditions E_1, there are no competing E_2's, conditioned by the former E_2, that would be excluded by E_1. In such cases, the relation E_1—E_2 could be labelled a nonsymmetric transformation (nonsymmetric synonymy; and for E_1—$\bar{E}_2$ — nonsymmetric anti-transformation and nonsymmetric opposition). An example might be the relation between an imperative (in some uses) and *I want you to*; e.g. *Read it to me* and *I want you to read it to me*. The sentence *Read it to me* has no strict counterpart $\bar{E}$, since *Don't read it to me* is an affirmative sentence with prohibition (apart from command and prohibition there is also permission, which is the absence of either of them, and prohibition requires its own negation), whereas *By no means do I want you to read it to me* is a direct negation of *I want you to read it to me.* At the same time, *I want you to read it to me* is a conditioning expression with respect to *Read it to me* because readiness to use *By no means do I want you to read it to me* rules out the readiness to use *Read it to me.* Furthermore, the expression *I want you to read it to me* cannot be associated with any other expression that would exclude readiness to use *Read it to me,* provided the expression itself meets the condition of speaker's readiness to use it (where the same reference is assumed). In this respect, the situation is the same as in the case of *a is longer than b*, *b is shorter than a*. The difference consists in certain distinctive pragmatic properties of the imperative, which are superimposed on the assertoric content of *I want* and are absent from the negation of this content.

A relation between two *E*'s, which is neither semantic conditioning, nor semantic intolerance, could be called semantic tolerance, e.g. *yellow* —

heavy.

Finally, we may distinguish a relation between E_x and E_y such that either E_y in its own right — in a given form or in a form opposite with respect to affirmation—negation — conditions E_x, or E_y is conditioned by an expression E_z, which also conditions E_x. The latter type can be illustrated by the pair *artist* and *doctor*: they share *man* as a conditioning term. Expressions satisfying the above condition may be called (semantically) connected, others — (semantically) unconnected or separate; the corresponding relation is semantic CONNECTION (vs. semantic separation). Of course, semantically separate expressions always stand in the relation of tolerance; whereas expressions standing in the relation of tolerance can be semantically connected.

Considering the schema of semantic implication, it is easy to notice that finding anything like an acid test of semantic analysis is impossible; that is to say, no operation is applicable here that would be external to the issues in question, independent of them, and at the same time would settle them in an unequivocal, simple, and intersubjectively certain way. The point is that a complete or partial overlap of meanings, analyticity of a sentence, contradiction between an expression and the negation of its synonym, and other related notions are just different accounts of the same phenomenon.[3]

Thus one might plausibly suspect that semantic conditioning, and in its basic and most extreme case — the sameness of meaning, must be in some way known or assumed beforehand, in order for the formula involving contradiction to be satisfied; or it must be rejected in advance, so that the formula could have a negative result, as in the case of the expression *quadruped* coupled with *dog*. Nevertheless, from the heuristic point of view, employing the discussed formula involving contradiction has — probably thanks to the limiting, contrastive effect of negation — an undeniable value as a means of elucidating intuitions and restraining a loose flow of associations. Even less questionable should be the need for a radical and explicit separation of semantic conditioning from implication in general; failure to draw a sharp boundary between them threatens to mix up things that are fundamentally distinct (since normal implications become intelligible

[3]Cf. Poznański 1966: 386: "The concept of analyticity is a member of a whole family of related notions — meaning, synonymity, contradiction, necessity, definition, semantic rule [...], these notions overlap one another in such a way that any attempt at defining one of them by means of another sooner or later leads to the starting point. In other words, all these concepts are more or less on the same level of intelligibility, or unintelligibilty."

only after we have a functioning linguistic apparatus, which — being a logically more fundamental network of conditionals of a special type — must be independent from these implications); it also threatens with the prospect of unending and hopeless disputes. Still, even this delimitation cannot be achieved, apparently, by means of independent formulas. The formula of semantic conditioning presented here presupposes that there is no synthetic implication $E_1 \rightarrow E_2$; so if we do not apply the proposed formula to certain expressions E_x and E_y, we often do it by assuming that $E_x \rightarrow E_y$ holds as a synthetic implication (e.g. *dog* $\rightarrow$ *quadruped*); but then it follows that in order to conclude that E_x and E_y fail to meet the conditions for E_1, E_2, we indeed must assume that in advance.

Let us now analyze the content structure of a locution, considering only properties which belong to the used expressions insofar as they are invariants (as discrete elements of code) rather than utterances; that is to say, we will set aside the actual use of expressions together with the accompanying circumstances belonging to the domain of the speaker's characteristics, ways of actualizing expressions, etc. For we are interested in analysis of language, not of human behaviour.

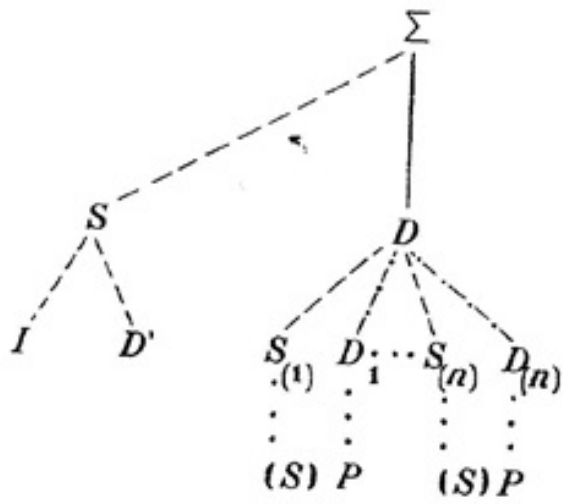
Semantic properties of expressions can only be indicated or described by way of using certain other expressions. It seems only natural to regard conditioning expressions as suitable for this task; even more suitable would be transforms; a complete presentation of content, however, is not attained until we have determined SYNONYMS of the analysed expression, maximally intricate, whenever possible.

By following this path and by taking into account even the most complicated and rich locutions, we reach the following general schema which contains components of both the simplest of locutions and — by way of potential successive branchings — the most complex ones.

The symbol of a locution as a whole is Σ.[4] A continuous line denotes the obligatory occurrence of component D; a dotted line — branching of D into any finite number of D's (from 1 to n) or the lack of branching with obligatory occurrence of P (Praedicatum) in each case; a broken line — optionality of a constituent. Three dots signify a possibility of an arbitrary,

[4] Σ as a symbol of a sentence or locution had been used by Lyons (1971: 149) but with a different motivation. Here, the intention was to reserve the symbol S for "Subiectum" in accordance with the established and wide-spread tradition, without suggesting any fundamental category difference between a sentence and a word, which in some cases should be, in fact, neglected (the predicative expressions in the complete form).

though finite, extension of the situation presented above them.



The symbol D, Dictum, denotes the whole locution excluding optional expressions such as: (a) the expression which is talked about, if the locution is about an expression, (b) expressions mentioned or quoted in a different way, (c) expressions or properties of expressions unconnected to the affirmation—negation opposition, which are designed to help the hearer focus on an object and refer the whole locution or its part to that object, or identify such a (possible) object, (d) expressions or properties of expressions connected with the affirmation—negation opposition, but taking positions which should only be filled by expressions or properties of expressions specified in point (c) and referring to the corresponding object. The symbol S (Subiectum) signifies expressions specified above under (c) and (d), while I — index — stands for (c) and D' — Dictum′ — for (d); the prime symbol $'$ simply means that D' is not identical with D but other than that shares all its properties with D; the position of S could be taken by I as well as by I and D'; this also applies to other S's in the diagram. Symbols (1) and (n) mean that the corresponding S's can, but need not, be distinct from the S next to D and from one another. The symbol (S) indicates optionality and arbitrariness of S next to P, if the latter does not exhaust D. Finally, P stands for a predicate (arbitrary in each case) in the sense of an expression (a set of properties of an expression) that falls under the affirmation—negation opposition; P is best illustrated by simple dictionary entries such as *white*, *dog*. Let us illustrate the diagram with example sentences:

$D = P$: *Is asleep!* [*Śpi!*][5]
$S = I$ —- $D = P$: *It is yellow.*
$S = I + D'$ —- $D = P$: *This apple is green.*
$S = D'$ —- $D = P$: (*A*) *doctor is asleep.* [*Lekarz śpi*][6]
S —- $D = S_1\ D_1$: *Read* (*You* —- *I want you to read*).
S —- $D = S_1\ D_1,\ S_2\ D_2$: *He drank milk* ({*he*, *x*} *drank*, *x milk*).
$S = D'$ —- $D = P$: *He drank milk* (answer to the question *What did he drink?* — x({*he*, *x*} *drank*, *x*) —- *milk*.

The diagram presented above includes only one obligatory component of a locution, namely — a predicate. A predicate can be referred to an object: this potentiality is its fundamental property. It need not, however, be actualized, and no part of the locution has to facilitate the process. The reference to a certain object can be default, can be entailed by various circumstances of the speech act. Furthermore, actualization of such a reference could be precluded from the start. This is the case of literary fiction, it happens in anecdotes, jokes. Still, the identity of potential reference tends to be marked by specific means (the standard devices being fictional names of fictional characters, places, etc.); in fact, this is the main point of literary fiction: displaying or pointing out the possibility of a given combination of predicates as having the same reference.

Doubtless, the key concept of the presented system is the affirmation—negation opposition. We exploited this opposition as the basic tool in characterizing semantic implication, and recently — in distinguishing the elements of the content structure of a locution.

Let us further elucidate this notion.

Its simplest examples are pairs of sentences differing solely with respect to the presence of the particle *not* (or a corresponding expression from another language) in one of the sentences; e.g. *Johnny is asleep*: *Johnny is not asleep.* Reducing this difference to the relation between an indicative sentence and a sentence formed from it by means of a sentential operator (negation), that is, a metalinguistic sentence (which may be sufficient for logic), fails to account for the uniqueness of the relation between the sentences in question. For in this way we lose sight of the fundamental and undeniable fact that both sentences say something about the same object — in this case about Johnny, instead of saying something about Johnny in one sentence and about some sentence in the second. It is also necessary to distinguish the relation *p*: *not p* from *it is true that p*: *it is not true that p.*

[5]Translator's note: in Polish, a subject term is grammatically optional.
[6]Translator's note: Polish lacks articles.

The following model is intended to account for these conditions by using as few elements as possible. We adopt the predicate *untrue* as applicable to sentences. Although this predicate refers to a sentence, it can refer — together with this sentence — to yet another object, according to the structure $D = S_1\ D_1$ with S as in the diagram. So, for example, (*Johnny is asleep*) *untrue* is the representation of a simple predication regarding a sentence; still, the entire representation can be referred to S — *Johnny*, hence we get: *Johnny*: (*Johnny is asleep*) *untrue*. It is precisely this formula that conveys the uniqueness of negation in the ordinary sentence *Johnny is not asleep*. In general, the affirmation—negation opposition can be now described as a relation AP_x — $A[(AP_x)$ *untrue*], where by A means we understand the object to which the locutions are being referred. At the same time we must make it clear that an expression at the position of (AP_x) can differ from P_x in the case of nonsymmetric transformation (cf. above).

It is precisely against the backdrop of such a relation that all predicates in a locution are perceived, and it is this relation that makes their understanding possible at all. It also holds in the case of sentences with the predicate *untrue*: here the corresponding negation is given by (x *untrue*)*untrue*, that is, the so-called double negation, which is often marked by the expression *true* (*it is the case*) or other means, above all by emphasis (logical stress) (cf. Wierzbicka 1969: 109—111); a sentence with *true* can be distinguished from an ordinary double negation by assuming that we are talking about a double negation next to a sentence-object, e.g. *It is true that Johnny is asleep* = (*Johnny is asleep*): (*it is not true that Johnny is asleep*) *untrue*.

The inseparable connection between a predicate and the affirmation—negation opposition consists in the fact that a predicate divides a particular universe of objects into two parts: objects that exemplify a given property, and all others. Hence the possibility of the unique sort of defective use of a predicate, which is denoted by the expression *untrue*; this expression, in turn, divides sentences into two classes and can also be used defectively in one way only; stating this defect amounts to asserting the truth of the original sentence.

On this account, it is necessary, of course, to regard expressions such as *it is true that p* as conditioning expressions with respect to p (in the sense of a semantic implication described above). Since *it is true that p* equals *it is not true that it is not true that p*, its reverse with regard to the affirmation—negation opposition is *it is not true that p*; readiness to use this expression precludes readiness to use p. In fact, *it is true that p* is also conditioned by p; so we are dealing with transforms. However, they are not

synonymous, because *p* and *it is true that p* have different referents (in the latter case it is an expression).

It means that the semantic structure of a locution containing *p*, such that *p* does not contain the predicate *untrue*, does not include this predicate even implicitly, that is, it does not contain *true* either.

At the same time, however, the implication holding between *p* and *it is true that p* forces the hearer of *p* — provided there are no circumstances inclining her to believe that it is not the case that *p* — to reject *it is untrue that it is true that p* as inconsistent with that implication, and thereby to accept *it is true that p*.

This fact reveals the special connection between *p* and true sentences, on the one hand, and between *p* in *it is untrue that p* with false sentences; it also corresponds to the normal reactions of the hearers.

Everything we have accepted so far, together with the diagram of the content structure of a locution, paves the way for rejection of any other components of that structure — alleged elements that may suggest themselves and were actually postulated. What I have in mind is, above all, the so-called modality, modal frame, modal attitude, or propositional attitude of the speaker, understood — by many — as a constant, necessary constituent of the structure of content that is distinct from *P*. Of course, we are not talking about rejecting the obvious fact that any utterance, i.e. a controlled use of a locution, involves a specific motivation on the part of the speaker and a particular attitude towards that locution, that is, things such as the will to inform, the intention to mislead, the will to make the hearer imagine something, to prompt her to do something, irony, playfulness, judgement, conjecture, belief in the truth of a sentence, conviction, certainty, etc. Neither do we mean that the speaker is unable to talk about all this — as if language offered no means of presenting those phenomena, or as though they were not actually used. Speakers naturally present their mental states, which constitute contents of some *P*, by means of various features of expressions — either in the form of distinct words or particles, or by exploiting differences in word forms, or, finally, by means of SPECIFIC prosodic (intonational) properties. The point is, however, that it is not necessary in the sense of THE PRESENCE OF CORRESPONDING LINGUISTIC INVARIANTS IN THE LOCUTION, while whenever such invariants are present, they appear in the Dictum, just as all the other ones.

In order to prove that, it is enough to point to suitable example sentences. The most suitable for this purpose are ordinary declarative sentences. If any modal attitudes of the speaker were represented in them by such and such

properties, e.g. by intonation or by the verb form, then the corresponding expressions such as *I want to inform you*, *I believe that* would have to function as conditioning expressions for these sentences. This, in turn, would require that readiness to use these sentences should be precluded by readiness to use corresponding negations, e.g. *By no means do I want to inform you...*, *I don't think that...*, etc. Yet this is not the case. Take for example a historical anecdote, say: *Lord Cavendish spoke only once during his time in the House of Lords — he asked if he could open the window.* Uttering this sentence in a particular situation perfectly agrees with the sentence *I don't want to inform you that Lord Cavendish...* The same sentence in a serious biography of Cavendish could, in a way, clash with the sentence *I don't want to inform you...* Then perhaps in the latter case the sentence about Cavendish implies *I want to inform you...*, whereas in the former it implies something different, say: *I want you to imagine...* or something like this? But even if we followed this path, the claim that modal attitudes correspond to some properties of utterances (sentences) themselves does not hold water: in both cases we are talking about THE SAME locution; what varies is the utterance, i.e. the speaker, the hearer, context, and so forth.

In fact, it is not only in the case of anecdotes, jokes, etc. that the sentence *I don't want to inform you...* fails to preclude the use of the corresponding locution (in the sense of "precluding" assumed in this article). Even in ordinary situations of everyday communication, adding the expression *I don't want to inform you that p* to the sentence *p*, e.g. *Johnny is asleep* — while referring to the same objects, hearers, etc., and given the same mental state of the speaker — does not create a situation such as in the case of the utterance $p \wedge \tilde{}p$ or *This is not an animal, this is a dog.* Uttering 'in one go' something like *I don't want to inform you that Johnny is asleep; Johnny is asleep* will elicit the following response from the hearer: "the speaker behaved at odds with what she had said in the first sentence," "the speaker behaved strangely, oddly," "by uttering the second sentence the speaker gave a reason to consider the first sentence false," etc. It will be, however, a strangeness close to a deviation from a norm, represented by the following utterance: *I hate Mozart. Play Mozart for me, please.* It would be wrong to say about the utterance *I don't want to inform you that Johnny is asleep; Johnny is asleep* that in the second sentence the speaker said something different from (opposed to) what had been said in the first one, and so that we are dealing with an altered speaker — not with precisely the same x, as required by the formula of semantic implication. This is a decisive factor. For we can juxtapose contradictory sentences and also obtain the utterance *Johnny is*

asleep; Johnny is not asleep or *This is not an animal, this is a dog*; but if it is to be a *use* of expressions, not a reproduction of sounds or inscriptions, then we cannot regard the speaker as internally unaltered with respect to what she is talking about — unlike the x from the formula. This situation is entirely different, for instance, from expressing approval for two conflicting sides, even with respect to the same object of conflict.

Thus we shall not regard the corresponding belief or desire, or a (true or false) representation of such a belief or desire, as a necessary condition for the use of a locution. On the other hand, there is indeed some peculiar connection between expressions and certain beliefs and desires: it is attested by customary inferences from utterances about such beliefs and desires, observed in linguistic practice, as well as by a quasi-contradiction occurring in utterances of the type: *p, but I think that not p*; *p, but think that not p*; *p, but I don't want to inform you that p*, etc. It has to be accounted for in some way.

The matter is solved by an implication in which certain beliefs and desires constitute the antecedent (rather than the consequent, that is, a necessary condition for using certain sentences); while the role of the consequent is played by the very use of sentences. It can be formulated in the following manner:

$$\{a,\ b,\ c\} \rightarrow \textit{the use of } E_1 \textit{ or } E_2 \ \ldots \textit{ or } E_n\ ,$$

where by a we shall understand a mental state of an arbitrary speaker, e.g. a belief that p; by b — her will to use E (where E corresponds to p in the language L) in order to elicit the belief that p in the hearer; by c — the speaker's behaviour in accordance with b; and by $E_1,\ E_2\ \ldots\ E_n$ — the use of one of alternative expressions meeting the conditions posited in b.

From such an implication, obviously true, from the presence of E_1, E_2 ... or E_n, and from the dismissal of the disjunctive antecedent of that particular E, we confidently infer something about, e.g., a or b.

This sufficiently accounts for the possibility of reaching mutual understanding, as well as for treating locutions such as *p, but I don't think that p* as paradoxical. Given a uniform application of this implication to the whole locution and an ordinary acceptance (occurring most often in everyday life) of the proper antecedent as the only one worth considering, the hearer first comes to believe that: "the speaker thinks that *p*," and then: "the speaker does not think that *p*," which gives a contradiction. We need to admit, however, that the contradiction holds between two beliefs which suggest themselves to the hearer, and not between the speaker's sentences.

The hearer arrives at this contradiction not through the analysis of the LOCUTION used by the speaker, but by considering the very USE of the locution (which does not belong to the language) and the dominant way of using locutions.

Let us now consider the proposal put forward by Irena Bellert (1972: esp. 85—87). She introduces the following implication:

A used a sentence *Z* with a structural description *D* which satisfies conditions *C* → *A* behaved linguistically as if *A* believed or intended to inform, or wanted ... *Z′*

In this implication the actual antecedent is constituted by the properties of the sentence, and the real consequent starts with "as if...," because "to use a sentence" and "to behave linguistically" are the same thing; likewise, the implication *John drank water* → *John drank a H_20 liquid* does not differ from the implication *x is water* → *x is a H_20 liquid*. Thus we can say that, in contrast to our diagram, Bellert's implication envisages three constituents of content intrinsic to the locution itself, to its very structure: a 'modal attitude' ("as if..."), *S*, and *P* (*Z′*).

Let us analyze the phrase *p as if q*, which is crucial for this analysis.

The first interpretation that suggests itself here is: (1) *p*, (2) *q* → *p*, (3) it is possible that *q* (= the contradictory of *q* is not known to be true, while *q* is not logically necessary). For instance, *John was fidgeting* (*p*) *as if he was expecting something* (*q*): "John's expectation of something in a given situation is impossible without *p*," "I do not know if *q*, but perhaps *q*, nothing prevents *q*." Notice that if the speaker assumes that not *q* (which contradicts "I do not know if *q*, but perhaps *q*"), the use of the phrase *p as if q* in the present sense is obviously unacceptable in standard English, given the assumption of truthfulness. So, for instance, we cannot honestly say *Wojski behaved as if he wanted to play a joke on Telimena and Tadeusz*, when talking about the scene with the fly-swat,[7] if we intend to report what we know from the text of *Pan Tadeusz*, namely, that Wojski bumped into the couple who were lost in conversation while he was chasing the 'gentry' (a sort of fly)[8] and intended nothing but to catch it.

[7] "When, between their two mouths, unexpectedly shot / First a fly and, soon after, the Tribune's fly-swat." (Adam Mickiewicz, *Pan Tadeusz or The Last Foray in Lithuania: A Tale of the Gentry During 1811—1812*, book 2, trans. M. Weyland)

[8] "Litwa has flies aplenty. Among these, there hum / A species quite distinct and called 'gentry' by some, / Which in colour and shape do resemble the others, / But broader, bigger bellied, than their vulgar brothers: / They drone dreadfully, flying, and vilely buzz too, / And so strong, they a spider's web often pierce through, / If caught, one of these will for three days thrash about: / For the spider himself it can wrestle

On this interpretation of the phrase *p as if q*, it is easy to find counterexamples refuting Bellert's implication. These are texts of literary fiction, openly presented as such, anecdotal texts, humorous texts intended to be taken in this vein by the hearer (e.g. *Have a drink, you're terribly thirsty*, uttered just after the speaker saw the hearer excessively quench her thirst). It would be weird to say — in the sense of *as if* presented above — that, e.g., Mickiewicz linguistically behaved as if he intended to inform us that the Chamberlain had led the polonaise.[9]

The second reading of the phrase *behaved as if...* is the following one: *he behaved in a way he would have behaved if he had (thought...)*. On this interpretation, one implies the falsity of what follows after *if*. Clearly, on this reading the vast majority of examples would be counterexamples to Bellert's implication: normally, the beliefs, desires, etc. that accompany everyday utterances are, at the very least, not rejected, but instead their presence is firmly accepted. Undoubtedly, Bellert did not understand the phrase *as if* in this way.

The third interpretation is given by the disjunction of the two previous ones. Yet this interpretation leads to bare tautologies — *The speaker believed... or didn't believe...* etc., which are, of course, consequents of arbitrary sentences and thereby are completely uninformative.

The fourth interpretation of the phrase *as if* is achieved by comparing it with expressions designed to pick out a quality which we are unable to define satisfactorily, that is to say, to expressions such as *something like a syrup*, *he performed jumps of sorts*, *the dog sort of danced*, etc. — expressions which are metaphorical or close to being metaphorical. It is obvious that such formulations are worthless in scientific discourse, since the decidability of the truth value of the corresponding sentences is fundamentally ruled out due to the lack of fixed patterns. It is also clear that Bellert's implication presupposes normal belief, will, etc., and not some mysterious analogues thereof.

The fifth interpretation which we can apply to the phrase *as if* in the discussed implication would state that we are talking about a behaviour which is customary or most often observed in people who believe ... Z'. The

and rout. / This the Tribune researched, and the thesis defended, / That from these 'gentry' lesser fly plebs are descended; / That to flies these as bees are to mother queen bee, / And that when they're extinct, of these pests we'll be free." (*ibidem*, book 2).

[9] "For the polonaise now — so the Chamberlain leaves / His seat, tossing back lightly his kontusz's sleeves,

And, twirling his moustache, he to Zosia advanced; / With a fine bow, invites her to lead off the dance." (*ibidem*, book 12)

problem with this interpretation is that there might be no actual belief etc. that Z' or no actual utterance that Z.

The sixth interpretation, which escapes the said difficulty, would be the thesis that the implication in question speaks of a behaviour that would be most probable in anybody who would believe ... Z'. Still, even this reading is unacceptable, because it becomes flatly false without relativizing it to a particular language (conditions D, C of a given sentence Z are satisfied by a smaller number of locutions than the number of potential counterparts Z' in all other languages). Furthermore, by appealing to the notion of probability and referring to the pattern represented by an 'ordinary' speaker, we introduce ambiguity, uncertainty, and randomness to the purported 'necessary condition'.

The seventh interpretation, which would evade the notion of probability, would speak of a behaviour such as we observe in a person who, say, believes that p and wants to use appropriate expressions of the language L (if there was such a person). Even this reading, however, is insufficient: the said properties of the person NEED NOT lead to the linguistic behaviour in question, or to any behaviour at all.

In order to avoid the above inconveniences, we can avail ourselves of another, eighth interpretation. Let us formulate it this way: "N behaved linguistically in one of the ways such that one of those ways would be employed by an arbitrary x, if a, b, c," where a, b, c stand for the same thing they denoted previously, that is the belief, the will to use a suitable E, and the appropriate behaviour, while by "one of those ways would be employed by an arbitrary x, if..." we mean the implication "$\{a, b, c\} \rightarrow$ " (rather than a counterfactual conditional). It is easy to see that, in effect, we have introduced to the consequent of the whole implication the implication we had endorsed before.

Apparently, we can accept Bellert's implication in this form, just as we had accepted the implication $\{a, b, c\} \rightarrow E_1, E_2 \ldots$ or E_n.

A question can be posed, however, whether such an implication could be said to genuinely inform about properties of an arbitrary locution taken in its own right, and in particular, whether it represents a real ANALYSIS of an arbitrary locution (understood as a sentence which is analytic with respect to the structure of the locution)?

This question must be answered in the negative. For we are dealing with a situation which could be schematically put this way: two structures, ab and ac occur, so what appears next to c is what appears next to b; since, however, a also occurs without b, one cannot see in b anything that could

expound the essence of *a*, that would, so to speak, inhere in that *a*. This is a situation that might be illustrated by the following example: *x is dancing a mazurka* → *x is moving like someone who takes part in the final scene of "The Haunted Manor;"* it is true, because a mazurka indeed appears there too; but can we seriously claim that the consequent is a result of the analysis of the antecedent? No, the truth of the antecedent follows from the accidental fact of including a mazurka in that opera. By the same token, being a horse involves being a kind of object fondly painted by a Kossak.

Of course, there is a significant difference here: linguistic expressions were brought to existence by human beliefs and by human will to reveal them; the cases missing these phenomena are secondary, derivative and in a sense unnecessary for the language to function. Nevertheless, neither those phenomena nor their, as it were, shadows ("as if...") inhere in the expressions themselves.

There is one more striking fact about the implicational scheme proposed by Bellert and about its applications in her work. Namely, will has been classified as a 'modal attitude' in imperative and interrogative sentences. While it is indeed included in the semantic structure of those sentences, it is there in the same way as the content which is the subject matter of an utterance in other cases, like, say, feeling in sentences such as *I'm in pain*, *I'm cold*, etc.; yet it cannot be put at the same level as the will to inform in declarative utterances. The speaker's will is linguistically represented in a quite distinct manner, e.g. through the imperative form (through the way it differs from the indicative forms). So that *You're careful* amounts to $S(you)$ — $D = P$ (*to be careful*), and *Be careful* amounts to $S(you)$ — D — S_1 (*me*) — D_1 (*I want you to be careful*). By contrast, the will to inform in the case of declarative sentences is INFERRED from the whole situation (incidentally, the same could be said about an imperative sentence). Evidence that 'the speaker's will that the hearer be careful' is the subject matter of the locution *Be careful*, just as 'the hearer being careful' is the subject matter of *You're careful*, can be found in normal and correct accounts of their contents (given the assumption of truthfulness) provided by the hearer in response to the question "what have you learnt?": in the case of the locution *You're careful* — *That I'm careful*, and in the case of *Be careful* — *That she* (the speaker) *wants me to be careful*. Of course, if we take into account various inferences that are not linguistically analytic, the hearer might well reply in the former case — *That she wants to inform me, that I'm careful*, but an analogous formula would be possible in the latter case, too — *That she wants to inform me that she wants me to be careful*.

In order to avoid confusion, it is necessary to emphasize that imperative sentences are not freely interchangeable with declarative sentences of the type *I want you to* (next to a predicate denoting action). Setting aside the fact that *I want you to* can have — and usually does have as S — "me" instead of "you," the effect of the expression *I want you to...* (even referred to the hearer as the main S) differs from the effect of the imperative. It is so because the task of the sentence with *I want you to...* is accomplished once the predicate has been supplied to the hearer's mind in a suitable actualization, whereas the imperative, while achieving the same goal (that is why we can speak of informing the hearer about the speaker's will also by means of the imperative), additionally establishes a formalized social situation — the situation of a certain commitment to react (even if negatively). Of course, some consequences of a practical nature also follow from the purely cognitive communicate *I want you to...*, but they are informal: their antecedent contains a variety of presumptions about the relations between people, content conventions, etc.

This way of viewing the imperative locates the difference between commands and declarative sentences at the pragmatic level. It means that in the strict sense the semantic content of the imperative is reduced to *you — I want you to...* (accordingly, Bellert's formula "the speakers wants" should appear, to use her terminology, in Z'), while a thorough description of pragmatic properties of the imperative is still in order. Bellert's formula "the speaker behaves as if she wanted," in contrast to the formula involving 'the will to inform', meets this pragmatic need. Yet not only does it wrongly exclude the will from the communicated content, from the subject matter of the locution, but it also mistakenly suggests that there is no communicative intention in the imperative. The pragmatic constituent of the imperative requires further description, for which there is no room here.

It can be added though that the pragmatic character of the difference between the imperative and *you — I want...* is reflected by a well-known property of the imperative, *viz.* the impossibility of negating it (*it is not the case that*). Although it is true that sentences with *I*, without certain adjustments, can be negated only by the person uttering a given sentence, the imperative cannot be negated even by the person who used it. This inability is not caused by a specific morphological form — unlike in the case of words such as *perhaps*, which cannot be negated because they do not constitute a personal form (**it is not the case that perhaps he came* is impossible because the expression *it is not the case* is liable to be combined with the form *came* and thus diverges from the subject of the intended negation, that is, from

the speaker's presumption about someone's arrival). Therefore, the lack of negation of the imperative is an entirely unique phenomenon. It seems that the only explanation can be given by ascribing to the imperative (as opposed to the assertoric forms) a certain function added to its representational relation to a certain state of affairs (namely, to the will) — the impressive function. For expressions are subject to negation only with respect to their representational relation, the communicated content. Everything else, that is, semantically opaque objects, as well as facts, including facts about using signs, are not subject to negation. Thus, it can be said: *It is not the case* (*not true*) *that it rains*, but not: *The use of the expression "it rains" is not true*; there was an occurrence of the use or there was no such occurrence (only a sentence about someone using the expression *it rains* could be untrue). By the same token, one cannot deny the use of a particular form, namely the imperative form, and the presence of something *over and above its semantic function* precludes treating the command as a simple image of a fact (such an image can be challenged, dismissed, i.e. negated).

Yet by no means can we appeal to the lack of simple negation in order to infer a purportedly unique character of will in the imperative. For, after all, such a will can be negated in a certain way, namely, by means of the expression *By no means do I want... / It is not the case that I want...*; this expression rules out the imperative, contradicts it, which proves the presence of will in the semantic, communicative structure of the imperative, and not in 'the speaker's attitude' towards the communicated content (the imperative does not communicate the presence of the relevant property of the object to which the desire pertains).

When we talk about 'modal attitudes', it is worth noting that just as it is by virtue of inference which takes into account various aspects of the situation that we can claim that the speaker wants to inform someone about this or that, so we are able — by considering certain circumstances of the utterance — to arrive at conclusions about the state of affairs itself, and in some cases we can proceed more radically than in others. For instance, the transition from the conclusion that the speaker wishes to inform someone about the colour of an object to the conclusion about that colour requires, among other things, accepting that the speaker is not colour-blind, while the spontaneous cry *I'm in pain!* can lead us to the conclusion that "the speaker is behaving as if she felt pain," perhaps even more so than to the conclusion that "she wants to inform us about the pain." Still, none of them is a purely linguistic analysis. Drawing the conclusion "she is in pain" can be accelerated, e.g., by a specific emotional intonation of the utterance. Since,

however, such intonations are not codified and thereby not associated with a fixed list of invariants, we cannot regard them as linguistic elements which would imply something in a semantic way, in the sense clarified above. It is worth noting that such a position about intonation (cf. Martinet 1964)[10] is based on the fact that there is no point in speaking of a mistake about emotional intonation, unlike in the case of invariants, e.g. words, the place of so-called logical accent, the opposition of interrogative and declarative intonation, etc. By feigning pain, one can simulate, for better or worse, the whole spectrum of intonations exhibited by people who are genuinely in pain, but it is impossible to switch between them by mistake, precisely because we are talking about a continuous scale, without invariants or discreteness.

Yet another category of cases where the notion of the modal attitude 'will to inform' gives rise to difficulties, are sentences about the hearer, i.e., sentences with S — "you." For a great number of such cases it is rather the conjecture about "the will to inform you about the KNOWLEDGE (BELIEF) of the speaker about the hearer" that suggests itself; cf. *You know that this suits you*, *You went to a concert yesterday*, etc.; it would be unnatural to speak of "a sort of (as-if) will to inform the hearer about herself."

Yet introducing a separate modal attitude for second-person sentences would amount to a direct acknowledgment that it is inferred from extralinguistic accidents of certain speech acts. On the other hand, not all second-person utterances have the unique character sketched above: in many cases they do not differ at all from other sentences; cf. *You've soiled the back of your coat.*

This point further underscores the difficulty of finding a formula that would encompass all cases while resting solely on linguistic features and the bare fact of their being reproduced by the speaker. Of course, one might appeal to the phrase *as if* and claim that 'something' of the 'will to inform' is always present here. Yet this would boil down, in turn, to an excessive 'pinch of salt' in one's approach to formulas and the terms used in them. Finally, we might appeal to the analogy between declarative sentences with *you* and declarative sentences with *he* etc. and contend that, since linguistic features do not entitle us to anything else, a formula which is valid in the case of sentences with *he* must be equally valid, in semantic analysis, for sentences with *you*. That, however, would openly beg the question; when we set about analysing locutions according to a schema, we are not allowed to fix in advance the variables whose explication is supposed to be the result

[10]We should add a qualification to Martinet's otherwise accurate observations on intonation: the difference between interrogative and declarative sentences which he is talking about (Martinet 1964: 30) is in fact discrete in character.

of the analysis. It is true that a sentence with *you* and a sentence with *he* differ in nothing but S — the object they refer to; what is different (though inconsistently!) is the practice of using them — for instance, the mental phenomena accompanying them. This, however, is exactly the fact that leads to the absence of a universal formula corroborated in a purely linguistic manner.

Presumably, the most serious grounds for the idea of 'modal attitudes' are given by the difference which has been pinpointed above as the difference between D and D' and which can be illustrated by the traditional example *The king of France* (D') *is bald* (D). The necessary rejection of Russell's analysis — in the light of obvious dissimilarity to the sentence *There is a unique bald king of France* — leads us to grant the peculiarity of the expression *the king of France* in this sentence in juxtaposition with *is bald*: these things "are not said *in the same way*." It is at this point that the notion of modal attitude might seem to be useful. Namely, Bellert exploits the pair: "the behaviour as if the speaker believed" (for the nominal subject phrase, NP, or 'datum') — "the behaviour as if the speaker intended to inform" (for the rest).

Assigning two different formulas amounts IN ITSELF only to pinpointing the difference which was grasped beforehand; if we are to go on, we must go into details of those formulas. The point is that on normal understanding of "believe" and "want to inform about" Bellert's formulas do not differentiate between phenomena which we have in mind. "As though believing" can be perfectly applied to phrases such as *is bald*; but it also happens, though less often, that we are able to recognize, in an entirely natural way, someone's will to inform about some feature by means of a nominal phrase; cf. *This multiple Olympic champion...*, *That fraud...*, *John, who always knows better...* etc. Furthermore, specific properties of the discussed parts of a sentence are absolutely certain: a full actualization of the 'modal attitude' in some cases and just a similarity to one in others is out of the question.

Apparently, what is vital and general in the discussed phenomena has been captured by our distinctions introduced above. True, only a portion of a sentence carries the 'proper', 'principal' communicate. Still, this fact reflects the concept of D as the concept of a part corresponding to the WHOLE locutions (or just being one of them). By contrast, the special character of D' is reflected by the fact that its position could be taken by a pure name, an index, that is, an element that is not subject to the affirmation—negation opposition, an element which does not 'inform' in the sense of choosing one of two possibilities offered by the predicate, but serves an ancillary

function by helping in finding the object to which the locution should be referred and which is given absolutely — cannot be subject to hesitation or controversy. Nevertheless, placing ordinary predicates in S, via D', is responsible for the fact that D' exhibits normal properties of P, including the affirmation—negation opposition and the problem of truth value (as Russell insisted), and is not some mysterious intermediary parameter between an index and a predicate but a well-known characteristic of an object. Such treatment of D' allows us to account for the fact that what the speaker does with D' is described, in a natural and non-figurative manner, by the same verb "to say" which is applied to D; cf. N_1: *That long-legged one won...* — — — N_2: *But you said that the winner had long legs.*

Let us emphasize in this connection that on this picture we are not being sent the speaker's intentions, beliefs, etc., which can vary to a large extent without changing any objective, linguistic facts, such as the forms being used (e.g. the nominative, phrases with *which*, etc.), the word order, the relation to logical accent, which force a particular mode of perceiving the predicates in D' and D — absolutely, not relatively or tentatively.

Let us sum up our thoughts regarding 'modal attitudes'. Just as one is absolutely right to resist the legitimacy of drawing conclusions about the objective state of affairs from the very analysis of a locution, disregarding other features of the speech act (especially those pertaining to the speaker), so one must reject analogous inference about 'modal attitudes' of the speaker.

The conceptual apparatus deployed by Bellert has a very clear source: meaning has to be described, one way or another, by means of implicational formulas; then, since no imperative or interrogative sentences, or 'raw' sentences with empty arguments, fit into the schema *if...*, *then...*, one must look for a configuration in which there would be room for them too; the easy solution is the implicational treatment of utterances, instead of sentences, disregarding their individual, or non-universal, features: utterances ensure the non-emptiness of arguments and — described in declarative sentences — fit into the schema *if...*, *then...*

Nevertheless, as we have seen, the extended schema with the antecedent *A used...* is fraught with serious difficulties, insofar as we seek proper, generalized consequents. In its simple form, which does not explicitly separate (despite the appropriate intention) the so-called analytic propositions, which should be intended here, from synthetic ones, which depend on our knowledge about the world, not about the language, such a schema does not sufficiently protect us against confusing those two domains; which, in semantics, is unacceptable.

So there is a need for further attempts to encapsulate semantic analysis. We have made such an attempt in this article.

Bibliography

1. Bellert, Irena (1972) *On the Logico-Semantic Structure of Utterances*. Wrocław: Ossolineum.

2. Lyons, John (1968) *Introduction to Theoretical Linguistics*. London: Cambridge University Press.

3. Martinet, Andre(́1964) *Elements of General Linguistics*. Chicago (IL): University of Chicago Press.

4. Poznański, Edward (1966) "Spór o analityczność." In: *Logiczna teoria nauki*, Tadeusz Pawłowski (ed.), 363—397. Warszawa: PWN.

5. Wierzbicka, Anna (1969) *Dociekania semantyczne*. Wrocław: Ossolineum.

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NOTES ON THE CONCEPT OF INFORMATION

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1. INTRODUCTION

The term "information" is currently one of the popular expressions that make natural language utterances seem modern."Information" is replaced by expressions such as "signal," "sign," "symptom," "message," "list," "advertisement," "text," "report," "meaning," "sense," "content"(of a sentences or a word) etc. In science, "information" is used as a synonym for "entropy," "vagueness," "indeterminacy," "unawareness," "ignorance" or (with a different interpretation) as a synonym of "negative entropy," "definiteness," "determinacy," "order," and "knowledge."

The term "information," used in the first half of the 20th century, especially in physics and telecommunications in the description of the problems associated with the technique of transmitting messages can be found in the dictionaries of most sciences, especially economics, biology, psychology, sociology, even linguistics and history. For several years now it has been present in the theoretical terminology of scientific methodologies, epistemology and semiotics.

The expression "information" did not enter these scientific languages directly from the natural language, but was taken from the theory of digital computers and communication theory (the theory of telecommunications). This was, among others, due to systematic mathematization and computerization of science, especially humanities.

The question arises: what is this "information" which the exact sciences pass on — with all that it entails — to other branches of knowledge? This question about definition can be expressed more accurately: "What does the

term 'information' mean?" If we assume that the meaning of an expression is determined by the procedures of use (so by the rules operating in a particular language) and by its uses, i.e. the specific context and extra-linguistic situations in which a word occurs, the above question can be formulated as follows: "what are the uses and the procedures of use of the expression 'information'?"

In general, we can say that the expression "information" is used in the majority of cases as either a concrete name (the name of an object or an individual) or the name of a FUNCTION. Since the significant part of research is related to the definition and the use of the concept of information understood as a function, this procedure of use will be the chief topic of this paper. But before we get to the main point, a few comments are required on the first way of using the term "information."

2. THE TERM "INFORMATION" AS A CONCRETE NAME

"Information" generally performs the role of a concrete name when it is used as the name of various kinds of strings of signs, in the broad sense of the latter word. These are usually strings of digits or letters. They may, but need not, form certain entities, which, in turn, are also referred to as information. The synonyms for thus understood information are, as listed at the beginning, words like "signal," "sign," "symptom," "message," "list," "advertisement," "data" (numeric or letter), "text," "report" and others. It is worth noting that, in such cases, it is not about the content or the meaning of the used signs, but only about their physical structure. In the case of inscriptions, what comes into play is the amount and the distribution of ink on paper. In the case of vocal signs — the intensity, the pitch and the tone color of sounds. This is how the word "information" is used e.g. in the theory of digital machinery and in numerous works concerning their use. In such works, the term "information" is usually synonymous to numeric or alphanumeric DATA. Currently, more and more often it is being replaced by the term "data" in order to avoid ambiguity. For example, the expression "mathematical machines are used to process information" is replaced by "mathematical machines are used for data processing."

In communication theory, the term "information" is in many cases used interchangeably with the term "message." For example, in the phrase "transfer of information is one of the most important tasks of modern technology," the term "information" can be replaced with the term "message" without changing the meaning of the whole sentence. "Information" as a "message" is the name for words or images (transmitted in telecommunication

systems), various physical quantities characterizing objects that are remote or impossible to observe directly (which are transmitted by telemetry systems), so in all these instances it is used as a concrete name.

For a better illustration of this procedure of use, I will refer to a simple example taken from data preparation techniques for digital machines. The main task in this case is to represent data using a sequence consisting of only two characters: zero and one (0,1). In other words, a given set of characters, such as letters of the alphabet Z = {*a, b, c, d, e, f, g, h*}, has to be represented using elements of the set $B = \{0,1\}$, in other words, an eight-element set has to be represented by a two-element set. Depending on how big the set Z is, the zero-one sequences required to represent its elements may be short or long. Let us denote this "length," that is, the amount of ones and zeroes in the sequence, by the letter N. When $N = 1$, only two different letters, like b or d, can be represented by the elements of the set B:b as 0 and d as 1, or the other way round — b as 1 and d as 0.The following letters could only be denoted by 0 and 1, and so they would not be any different from b and d. When $N = 2$, you can already write them down with four characters using zeroes and ones. For example:

a — 0 0 $\quad$ c — 1 0
b — 0 1 $\quad$ d — 1 1

When the length N= 3, 8 signs can be written using 2 characters:

a — 0 0 0 $\quad$ e — 1 1 0
b — 0 0 1 $\quad$ f — 1 0 1
c — 0 1 0 $\quad$ g — 0 1 1
d — 1 0 0 $\quad$ h — 1 1 1

Generally, L number of elements in the set Z which can be represented using a sequence that has length N elements of the set B is:

(1)

$$L = 2^N$$

The assignment of elements of the set B to elements of the set Z is called CODING, or simply a CODE. Elements of the set Z are called INFORMATION. It is stated, for example, that with an 8-element sequence $N = 8$ of binary elements, i.e. 0 and 1, we can code 256 units of information ($2^8 = 256$). In such a case, units of information are counted "by piece" and

the elements of the set Z are the designations of the name "information." e.g. for the set under discussion these are the letters of the alphabet *a, b, c, d, e, f, g, h.*

However, we can assume that it is not the elements of the set Z, but sequences N of elements of the set $\{0,1\}$ needed to encode the elements of the set Z that will be called units of information I_h. We can write this in the form of the following relation:

$$I_h = N$$

The amount of information is therefore calculated by using the formula $L = 2^N$ in the following way:

$$N \log_2 2 = \log_2 L$$

Since $\log_2 2 = 1$

(2)

$$I_h = N = \log_2 L$$

N equals one, when L equals two. This unit is called a bit (binary unit). N is sometimes called Hartley's information measure after the author of one of the first works on the communication theory entitled *Transmission of Information*, published in 1928. Hartley's "information" is the name used for the method of assigning such a set of elements where each element consists of N binary elements — zero and one — to the elements of the set Z. The term "information" is thus used here as the name of the function.

3. THE TERM "INFORMATION" AS THE NAME OF A FUNCTION

Linking the concept of information with the concept of function has paved the way for generalizing and refining the latter concept even further. The concept of function is relatively well defined by the concepts of set and membership to the set, as well as the concept of ordered pair, so by the basic concepts of set theory. Function is also referred to as a particular kind of relation, namely, an injective relation whose domain is the set X and whose codomain is contained in the set Y. In other words, a function assigns to each element of X a particular (exactly one) element of the set Y, or, it transforms (maps) the set X into the set Y. A formal way to write that is presented as follows:

$$f : X \rightarrow Y$$

We ought to distinguish FUNCTION f from its specific values $f(x)$. A function is often defined by its domain, that is, the set X, and the formula *W(x)* which represents the element *f(x)* for $x \in X$. We say then that the function is defined by the formula *W(x)*. For example, the function of coding was defined by (1) $L = 2^N$, while the function of Hartley's information was defined by the formula

$$I_h = \log_2 L$$

Linking information with the concept of function is a good attempt at explaining the term under discussion, as it is closely related to the way the term "information" is used in natural language. In many cases, "information" stands for certain relations between linguistic expressions or utterances and the extralinguistic reality, or between signs and their user. In other words, following the intuitive sense of the language, "information" means certain semiotic — that is, semantic, syntactic or pragmatic — relations. To paraphrase the saying that without information there is no control, it could also be claimed that without information there is no reasoning and definitely no inferring, since the information function seems to be strongly connected to logical thinking.

Also, in natural language, certain properties of the information function are defined. We say that a piece of information may be bigger or smaller, it may have a zero or a non-negative value. We often consider the information contained in a sentence like "a dog is a dog" or in any tautological statement to have a zero value. On the other hand, utterances which appear unexpectedly and are somehow new, different from the original ones are treated as highly informative. Pieces of information can be added or compared, for example, the information of two unrelated utterances is perceived as a sum of the two pieces of information contained in each of these individual utterances.

Defining "information" as a function did not yet give this notion the opportunity to be introduced to the arsenal of basic theoretical scientific concepts. What "gave it a green light," was the linking of the concept of information with the concept of PROBABILITY proposed by Shannon in *The Mathematical Theory of Communication* (1948), who devised the following formula:

(3)

$$I = — \sum_{i=1}^{n} p_i \log p_i$$

where $p_i$is the probability of the i-th event, to form an n-element set. This formula resulted from the adaptation of the so-called Boltzmann-Planck formula used in statistical physics to the communication theory. It was introduced by Planck to determine ENTROPY, that is, a state of disorder (chaos) of a thermodynamic system

(4)

$$S = k \ln P$$

where S is the entropy of the system, P is the thermodynamic probability and k is the Boltzmann constant:

$$k = 1.38 \cdot 10^{-16} \text{ erg/deg}$$

3.1. Information and entropy

The term ENTROPY, first introduced by Clausius in 1865, served initially to determine the state of disorder and chaos in the motion of particles at a temperature above absolute zero. A typical manifestation of such chaotic motion is the so-called Brownian motion, which is a random, zig-zag motion of small particles suspended in liquid or gas. The function of entropy, which ties this concept with the concept of probability, was determined by Planck in 1900 by the above-mentioned formula (4) $S = k \ln P$. In the case of a "heat" interpretation, entropy is connected with the temperature of the system, it is always a positive quantity and it takes on zero value at the temperature of absolute zero, in which, theoretically, all motion of particles ceases.

In his work, Shannon proved that it is possible to extend the scope of the term "entropy" and assume that it can be designated to the uncertainties of ANY system, e.g. a system of signs transmitted through channels of communication. Under this assumption, the entropy of a given system is reduced when some ORDERING factor is operating, such as, in some cases, the lowering of the temperature of the system, ordering operations of the human mind etc. The chaotic motion of a particle in a liquid or gas may be interpreted, for example, as the inability to predict the direction in which this particle moves. In the case of such movement, all directions are equally privileged and equally POSSIBLE. The entropy of such a system is at its maximum.

But the moment some ordering factor operates, it increases the probability of any particular DIRECTION. In an extreme case, this direction can be completely determined. At that point, the entropy of the system becomes zero. The factor which reduces the entropy of the system was referred to as INFORMATION by L. Szilard (1928) and E. Shannon (1948). With this interpretation, information equals the amount of entropy reduction. Thus, the amount of information can be determined on the basis of the formula used to calculate entropy:

$$I = H = — \sum_{i=1}^{n} p_i \log_2 p$$

In the works by Brillouin and his continuators, the term "negentropy" was adopted in order to emphasize that, although information is equivalent to entropy, it is in fact its opposite. In some works, the term "negentropy" is used synonymously with the term "information." But it is a purely conventional matter and the formula (3) remains unchanged. It seems that with a specific interpretation of the formula (3) there is no need for a new term. For example, if a state of disorder or uncertainty will be interpreted as the state of our ignorance about some source of messages, then entropy is the measure of this ignorance. Any message obtained from this source reduces the state of our ignorance and brings in information. When we collect all messages provided in this source, the state of our ignorance becomes zero — we gained information, or, to put it differently, we became fully informed. Generally, we can say that information is a factor which imposes ORDER on the chaos of ignorance.

With a different interpretation, if we introduce the concepts such as MEASUREMENT and OBSERVATION, the relationship between entropy and information is as follows: the uncertainty about the results of measurement is determined by entropy. Each result reduces entropy and reduces uncertainty. This reduction of uncertainty provides information. Uncertainty before measurement corresponds with certainty after measurement.

3.2. Axiomatizing the concept of information

Shannon's formula (3) was the result of an intuitive application of mathematical formulas to the specific needs of the experiment. The first question, which Shannon already posed himself, was about the possibility of deriving this formula from more general assumptions. In other words, the question arose whether, or to what extent, the concept of information is "derivable" from other mathematical concepts.

In any situation where you have to deal with a certain function, it is convenient to describe the essential characteristics of this function with a familiar conceptual apparatus, and to identify other properties only on the basis of these fundamental axioms. The description of these properties depends on the choice of language. The language should be rich enough to be able to express through it a relatively large set of attributes associated with a given concept. One of such languages, used by many authors, is the language of modern mathematics, especially algebra. In order to describe information different algebraic systems are used, such as ring, field, lattice, Boolean algebra or vector spaces.

An algebraic system, or, in short, algebra, is an ordered pair (U, F), where U is any given set and F a finite system of operations. The basic terms used in the description of information are: the set of elementary events Q (otherwise called the space of elementary events), the set of subsets of Q (i.e. the class of sets called the set of events U) and elements of the class U, which are denoted by letters A, B, C etc.

The basic operations for the set $U$are: the union $\cup$ and the intersection $\cap$.

Algebra $(U, \cap , \cap)$ is a lattice if and only if the two operations, are defined as follows: For any two elements A and B of the set U:

(K 1)

$$A \cup B = B \cup A$$

(K 2)

$$A \cup (B \cup C) = (A \cup B) \cup C$$

(K 3)

$$A \cup A = A$$

(K 4)

$$A \cap B = B \cap A$$

(K 5)

$$A \cap (B \cap C) = (A \cap B) \cap C$$

(K 6)

$$A \cap A = A$$

(K 7)

$$A \cap (A \cup B) = A$$

(K 8)

$$A \cup (A \cap B) = A$$

A lattice is distributive if:

(K 9)

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

(K 10)

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

In the set U the relation of inclusion is a relation of partial order $\leqslant$

(K 11)

$$A \leqslant B \Leftrightarrow A \cup B = B$$
$$A \leqslant B \Leftrightarrow A \cap B = A$$

Thus, each of the operations $\cap$ and $\cup$, determines the relation of partial order.

A distributive lattice with two values 0 and 1, in which every element has a complement $\neg$ is called BOOLEAN ALGEBRA. We can write it

$$(U, \cup, \cap, \neg, 0, 1).$$

In this case, to the above-mentioned axioms we add the axioms which define the element 0, 1 and the unary relation $\neg$.

(K 12)

$$A \cup 0 = A$$

(K 13)

$$A \cap 1 = A$$

(K 14)

$$A \cap \neg A = 0$$

(K 15)

$$A \cup \neg A = 1$$

The elements 0 and 1 may be interpreted as follows: as either impossible and certain events or empty and the entire set Q.

Such a system of axioms is insufficient to define the field in which you can specify the information function. Class U has to be closed due to the operations of union, intersection and complement and it should also contain the entire set Q and the empty set $\emptyset$. Therefore, the axioms mentioned above should be followed up by:

(K 16)

$$\emptyset \in U$$

(K 17)

$$Q \in U$$

If $A, B \in U$ then

(K 18)

$$A \cup B \in U$$

(K 19)

$$A \cap B \in U$$

(K 20)

$$\neg A \in U$$

Thus defined class U is called the BOREL FIELD. The Borel field may be used to define the probability and the information functions. However, it requires two additional concepts: SET FUNCTION and MEASURE.

A SET FUNCTION μ is a function whose domain is a class of sets. Hence, it is a function defined not on the elements of the set Q, but on the elements of class U.

The set function defined on the elements of class U is called an ADDITIVE set function if for any two DISJOINT sets A, B in U , there is

(K 21)

$$\mu(A \cup B) = \mu(A) + \mu(B)$$

(K 22)

$$\mu(\emptyset) = 0$$

A set function defined on the elements of class U is called COUNTABLY ADDITIVE if it satisfies condition K 22 and condition:

(K 23)

$$\mu(\bigcup_{i=1}^{\infty} A_i) = \sum_{i=1}^{\infty} \mu A_i$$

for every sequence of pairs of disjoint sets A_1, A_2 ... $\in U$.

MEASURE is a non-negative, countably additive set function with real numbers defined on the basis of the Borel field of events. We can write it

$$\mu : U \to R^+$$

where R^+ is the set of real, non-negative numbers. In other words, the function assigns positive real numbers and zero to the elements of the set U.

Measure μ is finite (that is, it takes on values which are only real, finite numbers) if and only if

$$\mu(Q) < \infty$$

In this case for every A U there is 0 (A) (Q). A measure is a probability measure if

$$\mu(Q) = 1$$

When μ is the measure of probability it is denoted by P. Hence, the probability function satisfies the following axioms:

(P 1)

$$0 \leqslant P(A) \leqslant 1$$

(P 2)

$$P(\bigcup_{i=1}^{\infty} A_i) = \sum_{i=1}^{\infty} P(A_i)$$

when $A_i \cap A_j = \emptyset$, $i, j, = 1, 2 \ldots..$, $i \neq j$.

Algebra (U, P) is called probability space. Only in this space is the information function defined. For every A, B *in* U

(K 24)

$$I(A \cap B) = I(A) + I(B) \Leftrightarrow \text{A is independent of B}$$

(K 25)

$$P(A) \geqslant P(B) \Leftrightarrow I(A) \leqslant I(B)$$

(K 26)

$$I(A) = 0 \Leftrightarrow P(A) = 1$$

A real function which satisfies the conditions K 24 — K 26 is the function composition $-\log P$. For the properties of function $\log x$ present as follows:

1.

$$\log x \text{ is defined on the subaxis } (0, +\infty)$$

2.

$$\log 1 = 0$$

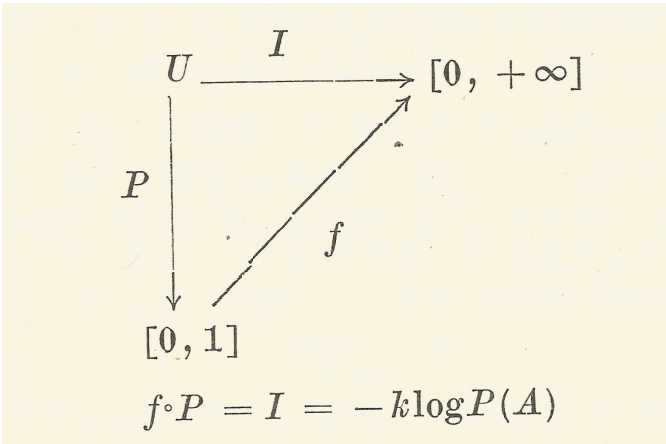
3.

$$\text{the function log is strictly increasing when log} > 0$$

4.

$$\log(x \cdot y) = \log x + \log y$$

Function I can be represented by the following scheme:

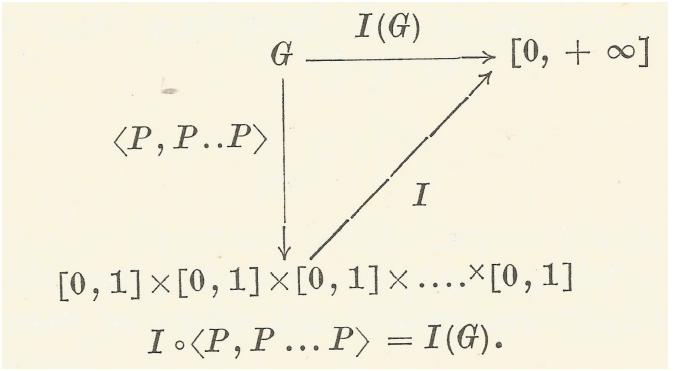


where k is any positive, real constant which takes on value 1 with a conventional choice of unit. f: [0,1] → [0, +∞]

When we are dealing with a system G of mutually exclusive elements, it is possible to define the average information of this system by assuming that function I is a random variable which takes on values from [0, +∞] with probability $P(A)$, $A \in G$. In that case, the expected value of $I(G)$ is:

$$I(G) = \sum_{A \in G} I(A)P(A) = - \sum_{A \in G} P(A) log P(A)$$

Thus, what we get is Shannon's formula. Schematically,



Obviously, the axioms provided here are thus far the only ones. Numerous efforts have been made hitherto to make the conditions imposed on the domain (in which the information function is defined) less strict. For example, the distribution axiom K 9

(K 9)

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

can be replaced with the following expression when $C \leqslant A$:

(K 9)

$$A \cap (B \cup C) = (A \cap B) \cup C)$$

The lattice which satisfies the axiom K 9 is called a MODULAR lattice. Complemented modular lattices are not Boolean algebras. Yet, we can still determine their probability.

The measure of probability and information defined on a modular lattice is used e.g. in quantum mechanics.

Also, it is not necessary to define the concept of information on the basis of the concept of probability. The concept of information may be regarded as primary to the concept of probability. The first attempt in that direction was made by two Polish scholars R. Ingarden and K. Urbanik (1962), later by de Foriet and Forte (1967), Forte and Pintacuda (1968), and recently by Z. Domotor (1970).

However, these works still do not challenge the close relationship between the two concepts. For example, defining the information function in the Boolean domain of events (Ingarden and Urbanik) leads to univariate probability distribution.

4. CONCLUSION

The concept of information, used initially in communication theory, and then taken over along with the Shannon model by other branches of science, is closely linked with the concept of probability. Almost all works on the axioms of that concept use probability theory and measure theory. The mathematical apparatus used for this purpose is far richer than what was presented in Part 3, which was only meant to demonstrate the main idea behind this kind of axiomatization.

In contemporary works related to communication theory, the concept of information usually appears in the context of discussions about the transmission of messages over a noisy channel.

The function defined by Shannon's formula keeps, in this case, the name "entropy" as opposed to "information," which is used to determine the information transmitted over the channel (transmissional information). We denote the INPUT sequence (that is, random variables which describe the elementary input signals) by $\{S\}$ and the OUTPUT sequence by $\{Y\}$. The amount of information about the output sequence $\{Y\}$ provided by the input sequence $\{S\}$ equals the difference between the entropy of the output sequence and the average, conditional entropy of the output sequence where the input sequence is determined.

$$I(\{Y\} : \{S\}) = H(\{Y\}) - H(\{Y\} \mid \{S\})$$

If the input sequence is not known, the indeterminacy of the output sequence is $H(\{Y\})$. The indeterminacy decreases as the knowledge about the input sequence grows.

The properties of thus defined information function are as follows:

(1)

$$I(\{Y\} : \{S\}) \geqslant 0$$

(2)

$$I(\{Y\} : \{S\}) = I\ (\{S\} : \{Y\})$$

Therefore, in this discussion, the direction in which messages are transmitted is not important.

Another key concept related to information is channel capacity. It is the maximum amount of information which can be transmitted over a given channel:

$$C = \max_S I(\{Y\} : \{S\}) = \max_S H(\{S\}) — \mathrm{H}(\{S\} \mid \{Y\})$$

When the channel is noiseless $H(\{S\} \mid \{Y\}) = 0$

$$C = \max_S H(\{S\})$$

In the latter case, the amount of information transmitted over the channel equals the entropy of the input sequence. In other words, the produced output sequence eliminates the indeterminacy of the input sequence.

No matter if "information" stands for entropy of the difference of entropies, it still remains the name of a function, which, in many cases, can be calculated. Like the terms "weight," "pressure" and "temperature," it falls under the category of names designating classes of equivalence relations: "equally informative" (just as "equally heavy," "equally warm," "equally cold" etc.).

The need for finding measures of information measures and refining the concept of information has to do with communication difficulties of the modern world. These include the problem of the so-called information boom, i.e. the continuously increasing number of publications of all sorts. The question arises as to what novelties these publications introduce.

The issues raised more and more often concern the languages used in publications (especially in scientific publications) and the appearance of new expressions which are not always a response to new situations or the discovery of previously unknown relations. Gradually, it is becoming more difficult to transmit knowledge, which may consequently result in its rate of growth slowing down.

The concept of information is closely related to these issues and is often used to describe various types of analyses and possible solutions to these

problems. A closer analysis of the concept of information makes it easier to use it properly.

The main task is to establish the connections between the concept of information and the concept of meaning or content — that is, the sense of linguistic expressions. These topics are explored by numerous researchers committed to analyzing the concept of information, generally referred to as "semantic information."

Bibliography

1. Białynicki-Birula, Andrzej (1971) *Algebra*. Warszawa: PWN.
2. Brillouin, Léon (1969) *Nauka a teoria informacji*. Warszawa: PWN.
3. Domotor, Zoltan (1970) "Qualitative Information and Entropy Structures." In *Information and Inference*, Jaakko Hintikka and Patrick Suppes (eds). Dordrecht: D. Reidel Publishing Company.
4. Fisz, Marek (1969) *Rachunek prawdopodobieństwa i statystyka matematyczna*. Warszawa: PWN.
5. Hartley, Ralph (1928) "Transmission of Information." *Bell System Technical Journal* 7: 535—563.
6. Ingarden, Roman (1963) "A Simplified Axiomatic Definition of Information." *Bull. de l'Acad. Pol. des Sciences, Sêrie des math., astr. et phys.* 9[4]: 209—212.
7. Ingarden, Roman (1964) "Teoria informacji i termodynamika maserów." In *Postępy Fizyki* 15[3]: 287.
8. Ingarden, Roman and Kazimierz Urbanik (1962) "Information Without Probability." *Colloquium Mathematicum* 9 131—150.
9. Kobozev, Nikolay I. (1971) *Issledovaniye w oblasti termodynamiki protsessov informatsii i myslenia*, Moskva: Izdatielstvo Moskowskogo Uniwersiteta.
10. Maurin, Krzysztof (1971) *Analiza*, part I. Warszawa: PWN.
11. Nowakowski, Jerzy and Władysław Sobczak (1971) *Teoria informacji*. Warszawa: Wydawnictwa Naukowo-Techniczne.

12. Shannon, Claude E. and Warren Weaver (1949) *The Mathematical Theory of Communication*. Urbana: The University of Illinois Press.

13. Traczyk, Tadeusz (1970) *Wstęp do teorii algebry Boola*. Warszawa: PWN.

14. Ursul, Arkadiy D. (1971) *Informacja*. Moskva: Nauka.

15. Watanabe, Satoshi (1969) *Knowing and Guessing*. New York: John Wiley and Son.

Jerzy Kmita

AXIOLOGICAL HETEROGENEITY OF EVALUATIVE PREDICATES

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The aim of these remarks is to consider several issues associated with a phenomenon which will be characterized in more detail below and which I have called — as the title indicates — *axiological heterogeneity of evaluative predicates*. On the one hand, it seems that this phenomenon seriously affects the way in which we accept or reject evaluative statements, but, on the other, it seems possible to specify conditions under which this interference would not take place; its actual occurrence could be systematically explained by showing the extent to which — in particular cases — real conditions deviate from ideal ones.

1. The first-order evaluative order

Take a finite subset S of the set of atomic and molecular sentences. Sentences from S consist of predicates constituting a finite set, say with k elements, and of singular terms constituting an l-element set; if S contains $f(a_1, \ldots, a_n)$, where $f(x_1, \ldots, x_n)$ represents an n-ary predicate (atomic or molecular), then S also contains the negation of that sentence as well as all sentences formed from the predicate $f(x_1, \ldots, x_n)$ and l^n - 1 other possible ordered n-tuples of singular terms, together with negations of these sentences. In addition, our set contains logical tautologies.

Sentences belonging to S *are semantically interpreted* so that each sentence $f(a_1, \ldots, a_n)$ corresponds to a sequence of denotations of the constituent expressions, $<K, a_1, \ldots, a_n>$; we will call this sequence a *state*

of affairs corresponding to the sentence $f(a_1, \ldots, a_n)$. Let us also call the sequence $<K, a_1, \ldots, a_n>$ a *fact* if the sentence $f(a_1, \ldots, a_n)$ is true in the domain in which the sentences from S are semantically interpreted, that is, if $<a_1, \ldots, a_n> \in K$. Of course, K represents an n-ary relation which, in the special case of $n = 1$, is a set of individuals; to simplify matters, we will regard the set of individuals as a relation too, that is, as a monadic relation. In what follows, we will refer to the state of affairs corresponding to a sentence p by means of the phrase "that p."

Let A be the set of states of affairs corresponding to sentences in S. Then A need not be equinumerous to S; so, for instance, synonymy of some sentences from this set would imply smaller cardinality of S. It will be more convenient, however, to assume that the cardinality of S is identical with the cardinality of A.

Let us define a relation R which meets the following conditions:

(1) R is a partial order on A (of the $<$ type);

(2) for each state of affairs a, there is a state of affairs a' such that either aRa' or $a'Ra$;

(3) for all states of affairs a and a', if a and a' are tautological facts, then neither is in the case that aRa' nor that $a'Ra$;

(4) if a is a tautological fact, then there are states of affairs a' and a" such that $a'Ra$ and aRa";

(5) the relation T — such that aTa' if and only if it is neither the case that aRa' nor that $a'Ra$ — is transitive.

Accordingly, we will call the relation R a first-order *evaluative order* if there is an individual or a group of individuals for which R is co-extensional with the relation of preference.

Next, we will call all tautological facts — together with all states of affairs which are indifferent with respect to them (relative to the partial evaluative order R), that is, which stand in relation T to them — *axiologically indifferent* or *neutral* states of affairs (relative to R). States of affairs which stand in relation R to axiologically indifferent states of affairs will be called *positive values* with respect to R, while states of affairs such that indifferent states of affairs stand in relation R to them, will be called *negative values* with respect to R.

In attributing axiological neutrality to tautological facts, I take my cue from Richard C. Jeffrey, who in turn refers to Leonard J. Savage. According to Savage, the relation of preference can be intuitively considered as a particular way of ranking 'news items': a given 'news item' represented by a proposition (a set of equivalent sentences) can be desired, i.e. have the so-

called positive desirability, or unwelcome, i.e. have the negative desirability; alternatively, it can be no news at all, in the stricter sense of this word, if it concerns an obvious, trivial fact; the latter feature is characteristic of tautological propositions (Jeffrey 1965: 72).

This argumentation may be reinforced by pointing out that we always ascribe positive or negative values to states of affairs that could fail to be the case. This is the nature of values such as human actions, products, or their outcomes. In short, these are states of affairs whose actuality crucially depends on undertaking requisite actions (these actions are a necessary component of a sufficient condition for a given value being a fact). Besides, we also assess, positively or negatively, certain natural phenomena, e.g. such and such form of a landscape, or — in another respect — certain processes occurring in animal or plant organisms or in their environment. Setting aside the question whether this involves an anthropomorphic metaphor, it is enough to point out that, in any case, natural phenomena which are subject to evaluation are not tautological facts; and we are talking about axiological neutrality of the latter.

2. A condition of constructing a second-order evaluative order

Each sentence p from S such that the state of affairs that p is not axiologically indifferent will be called a *value-judgement* — under the condition that rules of the relevant culture system (Kmita 1971) ascribe the following sense to the action of stating p — it is a manifestation of endorsing an evaluative order R or a subordinate relation. Depending on whether the state of affairs that p is a positive or a negative value, we will speak of a positive or a negative value-judgement. In the former case the predicate of the value-judgement p will be called positively evaluative in the context of p, and in the latter — negatively evaluative in the context of p. Finally, in the case in which p is not an value-judgement at all, we will say that the predicate of p is axiologically indifferent in the context of p.

We must add two comments to these terminological specifications.

First, the concept of value-judgement characterized above should be understood as a relativized concept — and doubly so at that: it is relativized (1) to an evaluative order R (just like the concept of positive and negative value, as well as the notion of an axiologically indifferent state of affairs), and (2) to a culture system. Both relativizations can be joined together, e.g. by assuming that a given culture system involves a preference order which is co-extensional with the relation R, or by assuming that a relevant group of individuals who endorse a preference order is a culture group with

respect to a given system of cultural rules. Then we will only deal with one relativization — to a culture system or to a culture group, respectively. In what follows, for the sake of brevity, the relativizations in question will be assumed tacitly. Of course, it does not mean that they are irrelevant. On the contrary, applying them makes for one of the more important differences between positions such as absolutism, psychologism, or cultural relativism with respect to values. It is worth noting at this point that by the very fact of accepting the above terminological agreements I have taken an anti-psychologist position: value-judgements are sentences corresponding — by means of denotational rules — to particular states of affairs, as in the case of declarative sentences which are not value-judgements; and above all, I disregard the question whether making value-judgements is a symptom of experiencing such and such emotions; instead, I assume that it is a culturally regulated way of manifesting solidarity with an evaluative order accepted in a given culture. On the flip side, my conceptual apparatus allows room for the absolutist position, which presupposes a unique, suitably distinguished evaluative order.

Second, the notion of value-judgement introduced above does not include all statements which are usually labelled as such. First of all, I merely deal with value-judgements that may be called individual, since there are no quantified sentences in S. For similar reasons, values, as specified above, should be called individual as well. Of course, it does not follow that I would be inclined to refer terms such as "value-judgement" or "value" exclusively to atomic and molecular states of affairs; I have just specified the meaning of those terms in a particular case of their use, while leaving open the issue of their meaning in other cases.

There is another reason for not including all types of statements regarded as value-judgements. Namely, each value-judgement from the set S corresponds — by means of denotational rules — to a specific state of affairs; yet it is a well-known fact that not every value-judgement that we deploy in practice has this property. For instance, a value-judgement formed from the predicate *x stole z from y* can be assigned to a more or less definite state of affairs; such an assignment would be trickier in the case of value-judgements such as *x is dishonest*, and even trickier in the case of value-judgements such as *x is a bad man*. Thus value-judgements from the set S may be called *definite* value-judgements — so as to point out that they correspond to determinate states of affairs, while value-judgements lacking this property to a lesser or greater degree should be called *indefinite*. Accordingly, I am dealing here with individual definite value-judgements. In

what follows, however, I will employ this phrase only when it is necessary to prevent potential misunderstanding; in general I will replace it with the term "value-judgement" without any qualifications.

Let me make an additional remark about indefinite value-judgements. It seems that one might characterize them — when they are atomic or molecular sentences — as sentences not belonging to S but still serving as means of manifesting acceptance of a relevant evaluative system; in addition, they are connected with definite value-judgements via entailment relations (e.g. in English a value-judgement of the type *x stole z from y* seems to entail a value-judgement of the type *x is dishonest*), so that they presumably correspond to whole sets of (individual) positive or negative values — sets which can be defined, at least approximately.

Such a tentative explication of indefinite value-judgements can only be applied if we assume that the presence of value-judgements and evaluative predicates in a language does not preclude laying out the 'logic', i.e. deductive rules, of that language. Yet we might doubt precisely this transparency; perhaps value-judgements or evaluative predicates are applied in a way which is incompatible with any 'logic'. It is easy to find such facts: for instance, acceptance of a sentence of the type *x informed authorities about illegal activities of y* is sometimes a sufficient reason for accepting a sentence of the type *x is an informer*, but in other cases it is a sufficient reason for accepting the sentence of the type *x is not an informer*. If we were to acknowledge this situation, we would be forced to admit that one and the same language contains two analytic sentences: one of the form "For every x, y, if $f(x, y)$, then $g(x)$," and the second — "For every x, y, if $f(x, y)$, then not $g(x)$." Clearly, this would mean that the language under consideration lacks any specific 'logic'.

Nevertheless, the present problem can be viewed either *factually* or *idealizationally*.[11] When considered factually, it is not particularly interesting; practice is bristling with cases of using value-judgements or evaluative predicates which is incompatible with ordinary 'logic'; after all, it is not a distinctive feature of these expressions. What I have in mind here are the idealizational versions of the problem: whether we can find out general principles (of coordination — see Kmita 1971) that would enable a systematic account of particular cases of 'violating the logic' of language — on the basis of the idealizational claim that under certain ideal conditions value-judgements or evaluative predicates are applied in such a way as to

[11]Both terms are used in the sense assumed in (Kmita 1971). They are employed in a similar way by Leszek Nowak (1971a).

preserve the 'logical' structure of the language. In a similar vein, a physicist justifies, for instance, introducing the idealizational concept of mathematical pendulum; her account is substantiated by the fact that she is able to explain, in a systematic fashion, the behaviour of a real pendulum by appealing to idealizational theorems non-trivially satisfied by the mathematical pendulum together with suitable principles (of coordination). It is — apparently — the only way of justifying the introduction of an idealizational concept to the conceptual apparatus of empirical sciences.

In its idealizational form, our problem is extremely complex. I will make no attempt at a thorough justification of one of two possible solutions which I have presupposed by assuming that denotational rules ascribe definite reference to expressions making up value-judgements; such an assignment implies, of course, that value-judgements are semantically interpreted in a semantic model of the relevant language, so that they are consistently accepted and rejected in accordance with the 'logic' of that language, i.e. in line with its deductive rules. Nevertheless, this assumption may be treated as provisional. By imposing such and such additional conditions on the evaluative order R, we can show that, once they are satisfied, the states of affairs partially ordered by R cannot be regarded as the reference of value-judgements in any language since sentences with a reference specified in this way would have to be applied against the rules of a given 'logic' of language. We would then deal with a special case of *reductio*.

In what follows, I wish to deal with a possible property of the order R, which would bring out one of the aspects most characteristic of the practice of evaluating; this aspect seems to be crucially involved in the 'alogicality', so to speak, of value-judgements. If it were the case, and if it turned out that the said property of the evaluative order R is sufficiently important to be taken into account in an idealizational specification of value-judgements, then it would be necessary to abandon the set of concepts introduced above and, above all, the underlying assumption that it is possible to assign definite reference to value-judgements (by means of denotational rules).

Positive and negative values in the above-defined sense are — as I have already emphasized — certain individual states of affairs. This situation is not incompatible with linguistic intuitions associated with the word "value." We often hear statements such as *The value of this novella consists in its concise nature*; the same thought can be expressed, albeit in a less neat formulation, in this way: *That this novella is concise is a positive value.* Thus value is considered as an individual state of affairs. Yet the situation changes if we join an abstract noun with a nominal object which serves as a general name

and not as an individual term. In the statement *Conciseness of a novella is its value* (or virtue), the value is not regarded as a state of affairs. Admittedly, one might think that although the statement is not about an individual state of affairs (that the novella is concise), it still concerns a general state — that all novellas are concise. Yet such a view would be a mistake. When we are talking about the concise nature of this particular novella as a value, we have an individual state of affairs in mind, which consists in the actual — in our view — instantiation of the property of conciseness by the work under consideration. By contrast, when we are talking about the conciseness of a novella (in general) as a value, we have a definite property in mind which cannot fail to be exemplified by every novella. Hence in the latter case the value is a certain property or — more generally — a relation. One might even think that construing values as relations (especially monadic ones) is the most common way of understanding this concept.

At first sight, it might seem that nothing should be easier than constructing — on the basis of the notion of first-order evaluative order — the concept of the *second-order* evaluative order. The latter would not refer to individual states of affairs but to relations denoted by the predicates of the sentences from S. The second-order evaluative order would be a relation holding between relations, say, U_1 and U_2, if the first-order evaluative order R holds between states of affairs *that* $f(a_1, \ldots, a_n)$ and *that* $g(b_1, \ldots, b_m)$, where the predicate $f(x_1, \ldots, x_n)$ denotes the relation U_1, and $g(x_1, \ldots, x_m)$ — U_2. By developing a conceptual apparatus parallel to the previously introduced one, we would be in a position to speak of second-order positive and negative values and about positively and negatively evaluative predicates (without a relativization to the context of particular sentences).

Yet in order to make this construction possible, it is necessary that each individual state of affairs of the type *that* $f(x_1, \ldots, x_n)$ should be linked in the same way, by the relation R, to each individual state of affairs of the type *that* $g(x_1, \ldots, x_m)$. In other words, it would have to be the case that the denotation of the predicate $f(x_1, \ldots, x_n)$ precedes in the second-order evaluative order the denotation of $g(x_1, \ldots, x_m)$ or is preceded by it or remains indifferent with respect to it just in case — respectively — each individual state of affairs of the type $f(x_1, \ldots, x_n)$ always precedes each individual state of affairs of the type $g(x_1, \ldots, x_m)$, is always preceded by it, or remains indifferent with respect to it. We could say that the set of predicates belonging to S and meeting the above condition (on account of their denotations) is *preferentially homogeneous* relative to the evaluative order R.

It is highly doubtful whether the predicates we use in actual practice to frame value-judgements could be used to construct large preferentially homogeneous sets. For instance, we could value Bolesław Prus' *The Waistcoat* more for its endeavour to discover certain truths about the world than for its conciseness, but at the same time we could wish that some celebratory speech were more concise instead of being more instructive. In this situation conciseness and informativeness cannot be incorporated into the second-order evaluative order.

Furthermore, the predicates used to formulate value-judgements often fail to meet a requirement which is even weaker than the preferential homogeneity: they fall short of satisfying *axiological homogeneity* implied by the previous condition. We will say that the predicate $f(x_1, \ldots, x_n)$ is axiologically homogeneous if every sentence from the set S formed by means of this predicate is:

(a) always a positive value-judgement, or

(b) always an axiologically neutral value-judgement, or

(c) always a negative value-judgement.

Clearly, the concept of axiological homogeneity of an evaluative predicate can also be employed outside the framework of the conceptual apparatus accepted in this article — without relativization to value-judgements from *S*. I will exploit this possibility below.

Although axiological homogeneity of predicates forming the sentences from S is a necessary but not sufficient condition of constructing a second-order evaluative order, it would at least allow us to divide all relevant predicates into three principal groups: positively evaluative, axiologically neutral, and negatively evaluative. However, as I have just mentioned, evaluative predicates often fail to exhibit even this weaker sort of homogeneity — given that the term "evaluative predicate" only denotes predicates which are at least sometimes used to make (individual) value-judgements. For instance, a statement of the type *x lied* — to use a stock example — will tend to serve as a negative value-judgement, but there are situations in which such a statement is a positive value-judgement or at least an axiologically neutral assertion, e.g. in a context such as *In order to spare him the suffering that would be brought about by this tragic message, x lied.*

3. The relationship between axiological heterogeneity of evaluative predicates and the phenomenon of 'alogicality' of value-judgements

Let us now assume that axiological heterogeneity of evaluative predicates

is sufficiently important to take it explicitly into account in an idealizational specification of the way of using value-judgements, or — at least — not to disregard it entirely. Will we be forced to admit, in accordance with often-expressed intuitions, that value-judgements cannot be applied 'consistently', that they must be 'alogical'?

It seems that these intuitions are based on certain accurate observations as well as on a vastly popular belief concerning value-judgements. Let us begin with the observations.

It is relatively easy to ascertain empirical phenomena such as the fact that one and the same person can accept the statement *During the battle, x eliminated y from the fight* without accepting the statement *x is the killer of y or wounded y gravely*. On the other hand, the same person, in some other cases, will tend to accept the latter sentence on the basis of the former — by appealing, perhaps, to the relation of entailment holding between the sentences. All depends, of course, on the relationship the assessing person z bears to x and y. If x is a soldier from z's country (and y is an enemy) the situation may look differently than in the reverse scenario. At any rate, it is clear that the reason for our exemplary 'alogicality' is the axiological heterogeneity of the predicate *During the battle, x eliminated y from the fight*. For some substitutions of individual terms for the individual variables, we will obtain a sentence which is a positive value-judgement, but different substitutions may result in a negative evaluation or an axiologically neutral assertion.

It might seem that a general characterization of the relevant case of 'alogicality' of value-judgements could be framed — without invoking the concept of axiological heterogeneity of evaluative predicates — in the following way: given two individual sentences of the type $f(x_1, \ldots, x_n)$ and $g(x_1, \ldots, x_m)$, comprising the same individual terms, if the latter is a negative value-judgement and the former — a positive one or not a value-judgement at all, then the acceptance of the former does not lead to the acceptance of the latter. The point is that such an analysis would be too superficial. The case would never deserve any attention if the predicate $f(x_1, \ldots, x_n)$ were axiologically homogeneous. For if the acceptance of a sentence of the type $f(x_1, \ldots, x_n)$ always consisted in the act of acceptance of a positive value-judgement or an axiologically neutral sentence and never led to the acceptance of a sentence of the type $g(x_1, \ldots, x_m)$, which would always be a negative evaluation, then we could easily reconcile this situation with the 'logic' of language by simply assuming that there is just no inferential connection between these two sentences. The 'alogicality', however, consists

in the fact that, on account of heterogeneity of the predicate $f(x_1, \ldots, x_n)$, the acceptance of this type of sentence sometimes constitutes a sufficient reason for accepting sentences of the type $g(x_1, \ldots, x_m)$, but in other cases — it falls short of providing such a reason or even serves as a sufficient reason for accepting the negation of a sentence of the type $g(x_1, \ldots, x_m)$.

Of course, the example under consideration is only a special case of the phenomenon which might be called 'alogicality' of value-judgements involving axiologically heterogeneous predicates. In general, the phenomenon might be presented in the following way: if $f(x_1, \ldots, x_n)$ and $g(x_1, \ldots, x_m)$ are evaluative predicates such that at least one of them is axiologically heterogeneous, and it is not the case that every uniform substitution of individual terms for variables results in two sentences such that acceptance of one of them is independent from the acceptance of another, then it is impossible to establish a definite 'logical' relationship between these two predicates (between these two types of sentences).

Of course, all of this applies to well-known phenomena associated with making value-judgements. Common observation seems to teach us that axiological heterogeneity of evaluative predicates prevents establishing definite inferential connections which could hold between sentences made up of these predicates. The principal cause of this state of affairs is a more general fact that the acceptance of an individual sentence q on the basis of accepting an individual sentence p is possible for someone who accepts a requisite evaluative order and respects cultural rules of manifesting this acceptance just in case sentences p and q are, as value-judgements — so to speak — axiologically 'synchronized' [*równoimienne*]. Simultaneous acceptance of two axiologically 'divergent' sentences would lead to disregarding the accepted evaluative order or at least to breaking the accepted cultural rules for manifesting acceptance of this sort of evaluative order.

Alternatively, the situation can be characterized in the following way: the act of stating any value-judgement can exhibit a *twofold* sense: (a) descriptive-communicational and (b) axiological. In the case (a) the sense consists in communicating the state of affairs which is the reference of the value-judgement; in the case (b) the sense consists in manifesting the fact of accepting an evaluative order. The point is that sometimes it is impossible for a consistent speaker to satisfy both senses by way of stating the relevant value-judgement. It may happen, for example, that uttering a given evaluation would signal real acceptance of the relevant evaluative order but would be unable to convey — in the descriptive mode — the state of affairs which is the reference of the value-judgement, since from the

speaker's perspective the reference would not be a fact. The reverse scenario is also possible: in stating a given value-judgement, the speaker descriptively conveys — in accordance with her knowledge — a certain fact, but this statement commits one to the acceptance of an evaluative order which is in fact rejected by the speaker.

I submit that it is precisely because, in practice, the above-outlined conflict — which sometimes occurs between two kinds of senses of a value-judgement — is occasionally settled in favour of the axiological sense, that the axiological heterogeneity of evaluative predicates has a detrimental effect on the 'logic' of value-judgements.

Of course, in the framework of an idealizational specification of the way of making value-judgements, in other words — in constructing an ideal type of the speaker expressing value-judgements — we must assume that the speaker is aware of the conflict in question and in the case of its appearance refrains from satisfying the ordinary, twofold sense of a value-judgement: she either always clings to the axiological sense or always sticks to the descriptive-communicational sense. Without this assumption, the whole ideal-type construction would be inaccurate: it would fall short of satisfying the antecedent of the rationality assumption which stipulates domination of a particular purpose.

Are both possibilities equally plausible though? First, consider the second option. By assuming that the ideal speaker — in the case of a conflict between two components of the sense of a value-judgement — always sticks to the descriptive-communicational component, we guarantee that value-judgements are free of 'alogicality' so that they can correspond — due to suitable denotational rules — to a definite reference. In particular, the axiological heterogeneity of evaluative predicates ceases to play a destructive role, since it is not the heterogeneity itself that gives rise to 'alogicality' of evaluations (as a superficial observation would have it), but the fact that in making the value-judgement we do not limit ourselves, in the case of a conflict, to actualizing the descriptive-communicational sense; only then the axiological heterogeneity of evaluative predicates begins to be detrimental to the 'logic' of evaluations.

Let us now turn to the second possibility. Is it possible to assume that — in the cases of conflict — the ideal type of a speaker making value-judgments always clings to the axiological component of the complete sense of a value-judgement? Note that the very notion of the axiological sense of a value-judgement, consisting — as we have seen — in manifesting the fact of acceptance of an evaluative order, implies that the value-judgements are

previously assigned certain states of affairs encompassed by this order. This assignment, in turn, is possible only if in the cases of a conflict one respects the descriptive-communicational sense alone. Hence the two accounts are not on a par: one of them implies the other, is cognitively prior with respect to it.

A further elaboration of this claim — in outline — might run as follows. A more abstract ideal type of the speaker making value-judgements is an individual I_1 who meets, in particular, the condition that in the case of a conflict between the descriptive-communicational and axiological senses I_1 is aware of that conflict and consistently clings to the descriptive-communicational sense. On the other hand, a less abstract ideal type, an ideal type of a lower level (Nowak 1971a), is an individual I_2 who has a less perfect knowledge at her disposal and is unaware of the occasional conflict between the descriptive-communicational and axiological components of the sense of value-judgements, so that in her desire to do justice to both components she effectively actualizes the axiological component alone. The logical transition from I_1 to I_2 would obtain in accordance with a suitable principle of coordination, while the accompanying concretization of a relevant idealizational theorem[12] would constitute a mandatory step in explaining the actually observed, often 'alogical' ways of making value-judgements.

Without performing a detailed analysis of the issue of selecting adequate principles of coordination which enable a transition from the idealizational theorem non-trivially satisfied by the ideal type I_1 to the theorem non-trivially satisfied by the ideal type I_2, we will now put forward a more explicit response to the main question of this section: the question about the relationship between axiological heterogeneity of evaluative predicates and the phenomenon of 'alogicality' of value-judgements.

Let us call the value-judgements made by the ideal type I_1 — *objectual* value-judgements [*oceny przedmiotowe*] and the value-judgments made by the ideal type I_2 — *purely axiological* value-judgements.[13] Then: *the more 'purely*

[12]The theorem would be labelled *the effectiveness assumption*. I discuss this notion a bit more broadly in (Kmita 1972).

[13]This distinction corresponds to my previous division of value-judgements into objectual judgements and emotional judgements (Kmita 1964). The present sketch picks up the main strands of the earlier paper, yet differs from it whenever the latter exhibits psychologist inclinations (illustrated for instance by the notion of individual language; today I would agree with the critique of this view put forward by Zdzisław Najder, see Najder 1971). In this regard, an account closer to my present position is set out in the English, corrected version of the said article (Kmita 1966). I would like to add that Nowak (1971b), in reference to the distinction between objectual and emo-

axiological' and less 'objectual' is the character of the value-judgements, the more destructive is the impact of axiological heterogeneity of evaluative predicates on the 'logic' of value-judgements. By contrast, the 'logic' of fully objectual value-judgements is always unscathed in this regard.

Not only can this response be reconciled with the afore-mentioned valid observations concerning the correlation between axiological heterogeneity of evaluative predicates and the 'alogicality' of value-judgements formed from them, but it also paves the way for a systematic account of this correlation. Even so, the response could not be accepted by a supporter of the popular belief that the descriptive-communicational sense of a statement and its axiological character are mutually exclusive; value-judgements only involve the latter, so the concept of objectual value-judgement is (on this view) self-contradictory.

Of course, the axiological character of a value-judgement is not equated here with the fact that it has an axiological aspect, in the sense of the term "axiological" accepted above; the latter expresses a notion which assumes, as we have seen, a cognitively prior type of objectual value-judgement. In practice, this axiological nature of a value-judgement is usually regarded as a feature of the value-judgement which makes it: (a) an exclusively emotional exclamation, (b) an implicit equivalent of a statement about the experiences of the person who makes the judgement, (c) a statement about a value considered to be an item of a special kind — indefinable in terms of any non-evaluative assertion.

Undoubtedly, the main rationale behind this view is the phenomenon of 'alogicality'. In the light of (a) and (b) the phenomenon is easily explained, since the mental states — expressed or implied — need not, or even cannot, fall under any specific 'logic'; (c), in turn, provides unlimited possibilities of rejecting intuitive acts of recognizing the 'genuine' evaluative orders as well as acts of concrete evaluation. I will not make an attempt at a critique of these ways of explaining the 'alogicality' of value-judgements; some objections immediately leap to mind, and others stem from a more general debate — present in several of my works — with psychologism and axiological absolutism.

4. The norm of methodological axiologal neutralism

tional ('purely expressive') value-judgements, gives examples of the latter statements which — in the framework of the present article — I would label 'indefinite'; nevertheless, those examples are accurate in that the indefinite evaluations indeed tend to be 'purely expressive' (purely axiological — in terms of the present sketch) more often than the definite value-judgements.

The idealizational conditions constituting the ideal type I_1 can also be regarded as a kind of norm, and the ideal type itself — as an *ideal* of a speaker making value-judgements. Are there any practical reasons for stipulating such an ideal — arguments that would show the benefits of making value-judgements in the specified way? It seems that the answer is in the affirmative, especially if we aim for the requirement of making maximally objectual value-judgements at representatives of selected domains of activity. I refer here to science and, in particular, to the humanities. The greater part of the humanist vocabulary consists of evaluative terms and, more importantly, these terms are indispensable; humanists construct their concepts — as Heinrich Rickert would put it — as a 'reference to values': the very names of human activities or their products examined by humanists usually reveal that these activities or products are singled out and classified from the perspective of senses actualized by them, while these sentences are always positive values for the acting persons and usually for the researchers themselves. Hence, if humanists wanted to take their cue from neopositivists and free their claims of value-judgements, they would simply annihilate their own discipline.

On the other hand, if value-judgements occur and must occur among humanistic statements, making them in a purely axiological sense would be detrimental, among other things, to the logical structure of particular systems of those statements; practicing humanities as science might turn out to be impossible. I have used this counterfactually since I do not believe that the actual humanistic practice of making value-judgements is utterly dominated by their axiological sense. Nevertheless, actual deviations from the ideal of making exclusively objectual value-judgements are serious enough to be regarded as one of the main difficulties faced by the project of scientific humanities. This state of affairs is even harder to overcome due to philosophers and methodologists — popular among humanists — who made a virtue out of the weakness by putting forward standards and norms which encourage making value-judgements in a purely axiological mode and by legitimizing cognitive validity of this mode by means of various absolutist conceptions of values. All in all, it is hard to judge what was more harmful to the development of the humanities: these views and attitudes or the nonchalance of positivists with psychologist inclinations, who — due to their poor acquaintance with the actual processes involved in humanistic research — hindered the recognition of the methodological nature of the humanities.

The few exceptions include thinkers who, without demanding the impossible elimination of value-judgements form the humanities, managed to

put forward rules for procedures that would secure the objectual character of those evaluations. Presumably, these rules can be jointly expressed by means of the following norm of *methodological axiologal neutralism*: in the humanities (a) evaluative statements are allowed, (b) value-judgements should be controlled only with respect to their descriptive-communicational sense, (c) the axiological adequacy of a value-judgement — relative to any evaluative order (i.e. due to the fact that the judgement manifests the actual acceptance of a given evaluative order) — should not affect its acceptance or rejection.

Clearly, with respect to the above norm secures the objectual character of value-judgements and, in particular, rules out the possibility that using axiologically heterogenous evaluative predicates would lead to 'alogicality' of value-judgements.

As a final point, I should mention the names of thinkers who endorsed the norm of methodological axiological neutralism and show that invoking these names is justified. Namely, the most celebrated supporters of this norm (albeit less known or even totally unknown in this regard) include Max Weber and the creators of Marxism: Karl Marx and Friederich Engels. However, I will not adduce the relevant argumentation here since, on the one hand, I have already had the opportunity to discuss Weber's views from this perspective (Kmita and Nowak 1968), and, on the other, the relevant positions of the classics of Marxism have been comprehensively presented by Nowak (1971b).[14] What Nowak calls the 'directive of antipositivist descriptivism' roughly corresponds to the norm of methodological axiological neutralism.

I will therefore limit myself to presenting an example which shows that the norm of methodological axiological neutralism was not merely an example of wishful thinking on the part of its supporters but they actually deployed it in practice. The statement *The entire social product belongs* (*is due*) *to the workers* can be treated either as a norm or as a value-judgement, i.e. a grammatically declarative sentence. Engels assumes the latter reading. Of course, with respect to the well-known evaluative order of the co-author of *The Communist Manifesto*, the state of affairs corresponding to this value-judgement is a positive value, so the judgement itself is also positive. Clearly, there is a conflict between the descriptive-communicational sense and the axiological one: by making the judgement, Engels would express his acceptance of the evaluative order he endorsed and, at the same, he would convey information about a state of affairs which is not a fact (in the second

[14]Let me add that I have arrived at similar conclusions in (Kmita 1973).

half of the 19^{th} century); the reverse situation would take place in asserting the negation of the value-judgement under consideration. Now, Engels, in accordance with the norm of methodological axiological neutralism, states that our evaluative statement is:

> formally falsefor it is simply an application of morality to economics. According to the laws of bourgeois economics, the greatest part of the product does not belong to the workers who have produced it. If we now say: that is unjust, that ought not to be so, then that has nothing immediately to do with economics. (Engels 1885)

It is worth adding that the norm of methodological axiological neutralism would be much better known and would have exerted a much greater impact on the practise of humanistic research, if it was not repeatedly interpreted — under the influence of positivism — as a prohibition of any value-judgements in the humanities. It is precisely this interpretation that became wide-spread in the case of Weber's well-known 'requirement of a value-free science', which was just a particular version of our norm. Even such an accomplished expert as Stanisław Kozyr-Kowalski endorses this interpretation, which forces him to recognize "an internal split in Weber's thought" (Kozyr-Kowalski 1967: 104f). Of course, if we assume that Weber imposed a ban on value-judgements in the humanities and at the same time thought, together with Rickert, that the object of these disciplines consists in phenomena distinguished by means of concepts obtained via reference to values — then it is difficult not to diagnose Weber with a peculiar kind of doublethinking. Even more puzzling is the fact that so many interpreters of Weber's methodological views fail to notice that his *Wertfreiheit* does not refer to science free of any value-judgements but to science free of *purely axiological* judgements.

Bibliography

1. Engels, Friedrich (1885) Preface to the First German edition of *The Poverty of Philosophy* (1847).
2. Jeffrey, Richard C. (1965) *The Logic of Decision*. New York (NY): McGraw-Hill.
3. Kmita, Jerzy (1964) "Problem wartości logicznej ocen." *Studia Filozoficzne* 1: 119—139.
4. Kmita, Jerzy (1966) "On the Problem of the Truth-Value of Value-Judgements." *Studia Filozoficzne* 3: 63—75.

5. Kmita, Jerzy (1971) *Z metodologicznych problemów interpretacji humanistycznej*. Warszawa: PWN.

6. Kmita, Jerzy (1972) "Kilka uwag o idealizacji w badaniach logicznych nad językiem nauki." *Studia Semiotyczne* 3: 57—74.

7. Kmita, Jerzy (ed.) (1973) *Elementy marksistowskiej metodologii humanistyki*. Poznań: Wydawnictwo Poznańskie.

8. Kmita, Jerzy and Leszek Nowak (1968) *Studia nad teoretycznymi podstawami humanistyki*. Poznań: Wydawnictwo Naukowe.

9. Kozyr-Kowalski, Stanisław (1967) *Max Weber a Karol Marks*. Warszawa: Książka i Wiedza.

10. Najder, Zdzisław (1971) *Wartości i oceny*. Warszawa: PWN.

11. Nowak, Leszek (1971a) *U podstaw marksowskiej metodologii nauk*. Warszawa: PWN.

12. Nowak Leszek (1971b) "Oceny w naukach społecznych w koncepcji twórców marksizmu." *Studia Socjologiczne* 3: 5—18.

Leon Koj

JARROLD J. KATZ'S THEORY OF MEANINGS [1]

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I. METHODOLOGY OF SEMANTICS

The starting point for Katz's deliberations is the claim that, so far, semantics suffers from many ailments. Although we know a great deal of facts, we do not have a theory which would organize and systematize them and would be capable of generalising them. Semantic concepts are formulated too broadly, they explain little and are incapable of properly describing the state of affairs. Finally, the theoretical proposals in semantics are mutually exclusive. Of course what Katz means is the condition of semantics of natural languages (Katz, Fodor 1964: 480).[2]

1. Katz, when postulating better semantic demands above all that semantics be a normal theory. What he wanted to achieve is to be able to predict previously unknown facts on the basis of the adopted semantic claims (Katz 1966: 103, 182). Such a prediction should consist in inferring consequences from the theses adopted. The mere process of drawing conclusions should be entirely formal, mechanical, and should not be based on intuition (Katz 1966: 105; Katz, Fodor 1964: 501). Katz does not provide more detailed information as to his understanding of formality. From the point of view of these postulates, Katz resists the traditional grammar, which he calls a catalogue of linguistic facts (Katz 1966: 106) and the so-called Oxford analytic philosophy

[1] This article presents Katz's views up to 1967. His later papers will be presented on another occasion.

[2] Aware of Katz's views I used the following Katz's works which were at my disposal: Katz 1964, 1966, 1971,

1961; Katz, Fodor 1964. I have not taken into account Katz, Postal 1964.

school (Strawson, Ryle, Austin). Although the philosophers from this school contributed greatly as far as the description of semantic details is concerned, yet they did not systemically attempt to develop semantic theories (Katz 1966: 87-88). The basis for the views of the analytics was the conviction that natural language is a creation formed by means of adding subsequent layers, i.e. something that does not have a homogenous structure (Katz 1966: 16, 89-95). Resisting the analytics Katz indicates the achievements of modern linguistics, evidently proving that languages have cohesive structure, which is capable of being described (Katz 1966: IX). These achievements provide an opportunity to construct natural languages semantics. What is more, it is impossible to correctly solve particular material problems without basing the proposed solutions on generalisations, which the analytics would prefer to avoid (Katz 1966: 93). For example, one needs to free himself from the features of particular ethnic languages in order to cope with the problems tackled by Plato, Descartes, Kant and Hume, writing in Greek, Latin, French, German and English, respectively (Katz 1971: 106). Therefore, a semantic theory of natural language not only can but has to be pursued.

2. In another postulate Katz demands that the semantics of natural languages be an empirical study and not a speculative, conventionalised construction. This requirement is juxtaposed by Katz with the programme of logical empirics, which according to our author is clearly conventionalised and non-empirical. Katz's opinion on the program of logical empirics is based mainly on the analysis of Carnap's views, where the most visible expression of conventionalism is the popular tolerance principle: everyone may create their own language in accordance with their wishes. One is only required to clearly formulate the method of the language construction (Katz 1966: 43). This principle, propagated by Carnap at the time when he did not acknowledge the possibility of constructing consistent and non-contradictory semantics, did not change later on, when Carnap started to construct languages, ascribing to them semantic properties (Katz 1966: 50 54). The most serious argument against the semantics of logicians, according to Katz, is that their semantics do not pertain to natural languages, but only to artificial ones. Therefore, the semantic theses of logicians do not describe the simplified versions of natural languages. What is described in the theses of semantic logicians is not an idealisation of natural languages. The theses of the logicians' semantics do not result in any semantic assertions pertaining to natural languages (Katz 1966: 62-68). Therefore, the assertions of the logicians' semantics are not a basis for predicting new semantic facts of natural languages. From the point of view of further considerations the

following arguments by Katz's are vital, which in his opinion undermine the semantics pursued by the logicians. Thus, it seems that Katz at least partially accepts Wittgenstein's views: the manner of use of expressions in a natural language does not depend on the knowledge of necessary and sufficient conditions of veracity (or more generally — on the conditions of having a denotation). Such conditions, according to Wittgenstein, simply do not exist, which is to be demonstrated by the famous example of the word *game*. There are no necessary nor sufficient conditions of a game, therefore there is no set of features distinguishing all and only games (Katz 1966: 70-76). And since, according to Katz, the essence of all semantic theories includes the fact that the necessary and sufficient conditions of denotation determine the use of expressions (Katz 1966: 46-48: 73), the logical semantics fails in the case of natural languages. The logical semantics is a semantics dealing with the relation of expressions to fragments of reality.[3] Therefore, natural language semantics cannot study the relations of expressions to reality. Such a conclusion follows from the assumptions adopted by Katz. This conclusion is never clearly announced by Katz, however his semantics seems to adhere to this rule consistently. Nonetheless, at least in one respect Katz wants to mimic the actions of logicians (whom he consequently calls logical empirics, which is however erroneous in case of Frege, Church and Tarski). For Katz's construction of a semantic theory in a formal manner is worth following (Katz 1966: 105). If a theory is not formal and based on intuition, then it actually is not a theory at all (Katz, Fodor 1964: 501).

It seems, moreover, that when constructing a semantic theory Katz understands it in such a manner that it should provide rules making it possible, in a finite number of steps, to determine the sense of complex expressions, when the meanings of simpler expressions are given. In short, he means effective rules, an algorithm making it possible to determine the meaning of complex expressions (Katz 1966: 152-153). This goal, set by Katz, exceeds the goals usually set by logicians when building their systems; usually developing an effective manner of proving theses is not the goal there.

3. We already know that, according to Katz, semantics should not be a theory determining the relation of expressions to reality. It would therefore be expedient to ask, what is to be explained in Katz's theory. Basing on the theories of physics, our authors say that various semantic theories should not build facts based on speech with all the mistakes that can be made,

[3]Cf. The criticism of Katz's view concerning the logical semantics by Robert L. Martin (1971).

restrictions of correctness resulting from the weakness of memory, accidental mistakes, imperfection of the speaking apparatus, etc. In a semantic theory, simplifying this complex, and sometimes random set of facts, one discusses an idealisation of actually generated strings of utterances. These idealisations are the abilities of an ideal language user. A semantic theory should therefore describe the competencies of the user and not the actual performance (Katz 1966: 115-117; Katz, Fodor 1964: 482). Language skills of the user which Katz means consist in the ability to communicate, which according to our linguist means the consistency of ideas of the speaker (writer) and the listener (reader) (Katz 1966: 98-99). At this point he decisively rejects behaviouristicly oriented semantics: one cannot speak of two adequately reacting robots that communicate. Similarly, one cannot say that two people are communicating with each other, if one takes into account only their reactions to sounds (Katz 1966: 99). Semantic competencies of a language user (not to be mistaken with syntactic competencies) are demonstrated in: a) noticing ambiguities not originating from the syntax, b) making the sentences unambiguous by adequate use of the context; c) detecting nonsense in syntactically correct sentences; d) the ability to paraphrase sentences (Katz, Fodor 1964: 485-486); e) determination of semantic dependencies between sentences (Katz 1964: 522); f) the ability to distinguish between analytical, syntactic and contradictory sentences (Katz 1964: 530).

4. Finally, we might ask, how, according to Katz, the competencies of an ideal language user are explained. It is known that language users also understand such sentences, which they have not encountered before, provided that such sentences are constructed from familiar expressions and in accordance with the syntactic rules of a given language. No language user has ever encountered an indefinite number of sentences which can be uttered. It is never known what new sentences a language user will encounter. In order to be able to cope with such new unpredicted sentences, the language user needs to have an ability to understand all possible sentences of a given language. This ability of the language user to understand any sentence of a given language cannot consist in remembering an infinite number of sentences, since the memory capacity is limited. It rather consists in the ability to systematically apply certain construction activities (in case of uttering sentences) or analysing activities (in case of receipt of a sentence). In view of the systematic character of these activities, one may describe them with the use of certain rules. And exactly with the use of rules one should explain the competencies of an ideal language user. Semantic rules are to present the immanent semantic knowledge of an ideal language user,

the knowledge, which explains the actual actions of the language users. These rules make it possible to generate an infinite number of objects by the relevant joining of simpler elements in order to form more complex objects, and therefore are of reconstructive character. (Recurrence rules provide: a) how to construct simple elements or simply enumerate them (initial condition) and b) how, from given elements of certain properties, to construct further objects of the same properties (inductive condition)). Therefore, semantics, describing and explaining the actions of the language users with the use of competence, must use the recurrence rules (Katz 1964: 520; 1966, 151-152).

The semantic rules mention meanings. Meanings of expressions are psychological beings, whose identity in the mind of the speaker and of the listener is the condition of the communication of these two: notions (Katz 1966: 176-177). These types of psychological theories are criticized more often. They are among others criticized since we are not able to realize what notions accompany particular expressions, e.g. conjunctions. One also notes that it is impossible to ascertain what notions are experienced by the interlocutor at a given time. We are therefore unable to determine when we are dealing with communication and when with misunderstanding and finally with incomprehension. In Katz's opinion his theory is not subject to normal criticism, to which psychologism is exposed, since Katz's ideas (notions) do not need to be realized (Katz 1966: 178). Their existence is not ascertained introspectively. Therefore, the impossibility to determine which notions are experienced by the use of such words as *when* or *in*, is not an argument against Katz's theory (Katz 1966: 179). In his opinion, ideas are theoretical formations which are in no way observable. Their existence is ascertained indirectly, namely, from propositions mentioning certain notions we derive observable consequences. If the latter are true, we obtain a confirmation of the initial propositions. Among those we will also encounter a proposition on the existence of notions (Katz 1966: 181-183; Katz, Fodor 1964: 517). What is more, Katz's theory does not even postulate that each expression must be accompanied by a notion. This makes criticism of Katz's theory even more difficult (Katz 1966: 184).

5. Since methodologies consider i.a. classifications, discussion of Katz's methodological views with respect to semantics will be ended with presentation of the relation of semantics to other studies of the language.

Katz differentiates between the theory of the language and the description of the language. The theory of the language is a generalisation of the descriptions of various languages. Descriptions of particular languages con-

firm or undermine the theory of the language. They are however additionally justified by the confirmed (by the descriptions of other languages) theory of language. In the theory of language one discusses language universals, i.e. what is common for all languages, and at the same time one provides a general pattern of linguistic descriptions (Katz 1971: 103). It is possible to presume that the theses of the theory of language have a quantified variable L, running across the set of languages (Katz 1966: 56-57). The task of the theory of languages is also to formulate criteria making it possible to choose the best description from amongst several descriptions of one language consistent with the observation data (Katz, Fodor 1964: 516).[4] Within a theory of language it is possible to distinguish a syntax theory (transformational grammar), a phonological theory and a semantic theory (Katz 1971: 104). If grammar is perceived in a broader manner, so that it encompasses the syntax and phonology, then semantics will be the remainder after taking away the grammar from the theory of the language (Katz, Fodor 1964: 482). Katz's views presented herein belong to the semantic theory, although the examples he gives are a part of the description of the semantics of the English language. Apart from the theory of language there is also the theory of performance (Katz 1971: 107). This study, according to Katz, is of strictly psychological character, since it determines the reasons (limited memory, defects of the speech apparatus, etc.) why language users diverge from the ideal and they themselves are not always satisfied with their performance (Katz, Fodor 1964: 482).

II. JARROLD KATZ'S SEMANTICS

As it has already been said, the language skills of a language user are described in semantics with the help of recurrence rules. The initial conditions for these rules simply determine the meaning of particular words (morphemes, to be more precise). The inductive conditions make it possible to discover the skills of generating semantically sensible complex utterances. These conditions simply inform on how to put together expressions with relatively simple meanings in order to receive expressions of relatively complex meanings (Katz, Fodor 1964: 482).

1. The initial conditions of semantic rules provide above all the meaning of the words and each of them has the form of a dictionary item. The dictionary, as understood by Katz, is very similar to an ordinary dictionary. In a dictionary item we first have a given word, an equivalent of the dictionary

[4]This point of Katz's doctrine is criticized by Quine (1972).

entry. Then the grammatical category of this item is specified. If the entry is syntactically polysemic, all grammatical categories are listed. Furthermore, there is information on the meanings of the word; whereby the meanings are listed in groups: after each grammatical category a relevant meaning (or a group of meanings) is provided (Katz, Fodor 1964: 494-495). If after one grammatical category several meanings are listed, then the word is semantically polysemic. We may use the word *shoot* as an example; sometimes it is a noun, at other times it is a verb in the imperative mood. The word *cow* is polysemic only semantically. Meaning is composed of notions. Determination of the meaning is composed respectively of the markers of notions, called semantic markers by Katz. Notions are the elements, which occur in many meanings; the semantic markers are therefore elements repeated in many designations of meanings.[5] Since expressions have a complex notional structure, the function of the markers is to present the meaning structure of the expressions (Katz 1966: 154-155). Moreover, the specification of meaning also includes certain kinds of selection rules (selection reading, selection restriction). The latter moment by specification of meaning indicates with which kind of expression and in what meaning a given word may be connected into a cohesive propositional whole. Let us illustrate these general remarks on the construction of a dictionary item with the example of the following dictionary item: *bachelor.* This word has only one grammatical category. The example will therefore be simple, all the more that we will take into account only two meanings of the word:

bachelor → noun (1) (physical object), (living), (human), (male), (adult), (who was never married), <specific>;

(2) (physical object), (living), (human), (young knight serving under the standard of another knight), <specific>.

In this example markers are in round brackets. In angle brackets there are selection restrictions. More detailed information concerning selection restrictions shall be provided below.

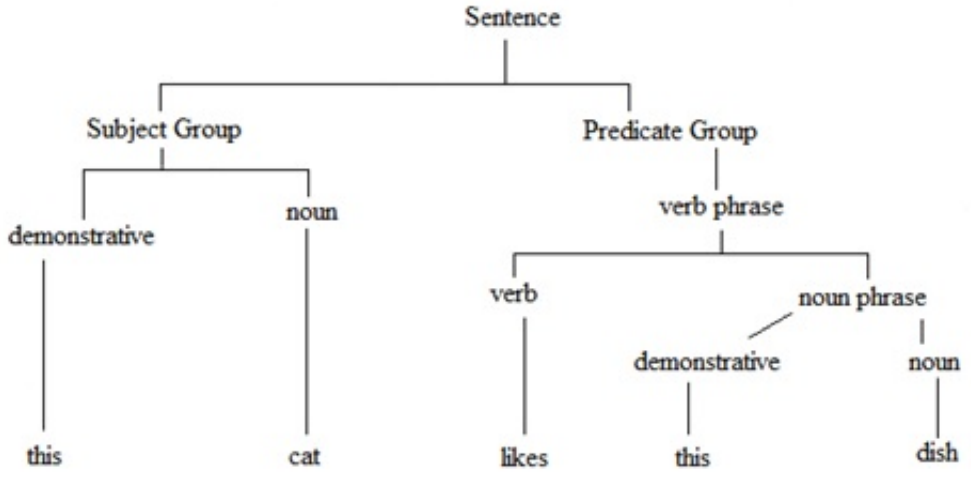
2. It also needs to be explained what Katz's motives were when he decided to construct dictionary items in this manner, since he did not base them only on the tradition of composing dictionaries.

Above all, the author tries to provide a justification that a dictionary and semantics are needed at all. Grammatical rules (generative grammar in

[5]In his earlier works, aside from the markers, Katz introduces distinguishers, indicating what is unique in a given meaning. Katz does not mention these distinguishers later. They are therefore mentioned in (Katz, Fodor 1964: 497) and (Katz 1964) but are absent from his later works (Katz 1966) and (Katz 1971).

its transformative version) do not make it possible to distinguish between sentences of the same syntactic construction, but differ with respect to meaning, e.g. *John ate a chop, John ate a cat.* Grammar does not explain why in certain cases, despite a difference in the phonological construction, sentences have the same meaning for example *John cracked the whip, John cracked the lash.* (Katz, Fodor 1964: 492). Grammar provides also no clues as to why certain sentences of correct syntactic construction are surprising for us, e.g. *John bit a high sound* (Katz 1966: 174; Katz, Fodor 1964: 483). In semantics the dictionary is used mainly in order to explain why sentences of the same syntactic structure may have varying meanings (Katz, Fodor 1964: 492). The projection rules (assembling meanings into complex wholes) are used mainly in order to explain such phenomena as lack of semantic sensibility (as illustrated above) by full grammatical correctness.

3. The dictionary and the semantic rules are used, according to Katz, only for the purposes of interpretation of the generated sentence structures (Katz 1971: 105). Therefore the arguments of the semantic rules (inputs) are syntactic structures (Katz 1966: 120, 131; Katz, Fodor 1964: 503, 414; Katz 1964: 520). Such understanding of semantic rules results in the necessity of placing the grammatical category (categories) of a given sentence in the dictionary, since in accordance with the rules of generative grammar, a diagram of the sentence structure has the form of a tree; for example the sentence *this cat likes this dish* has the following structure:



(In the diagram I have omitted the morphemes indicating the case, number and tense) (Katz 1966: 125). The words in the sentence have therein a specific grammatical category. When searching in a dictionary for relevant

meanings of words present in a given sentence, one should i.a. take into account the grammatical category of these words. As a rule, one word by different classification as to the grammatical category has different meanings. Therefore, in order to choose the relevant meaning, in accordance with the category of the word in the dictionary, we need to have the grammatical categories of words indicated in the dictionary.

As it has already been said, the semantic rules are applied to ready sentence structures. Katz together with other transformative grammar researchers distinguishes the surface structure and the transformable structure (the underlying phrase structure). The semantic rules apply not to the surface structures, but to the underlying phrase structures (I avoid the term "deep phrase structure" due to its ambiguity). Therefore, already at the pre-transformation stage, the slots in the sentence receive meaning. And since the ascribing of meanings begins at the bottom of the grammatical tree, i.e. at the stage of particular words, then already at the pre-transformation stage the sentence needs to be expanded by the most far-reaching details (Katz 1966: 131).

4. Semantic markers are principally used for the distinguishing of sentences with various meanings of the same grammatical construction (Katz, Fodor 1964: 498). Markers are symbols of notions (Katz 1971:112). Since Katz does not write a lot about the notions themselves, although they constitute principal elements of his theory, and the markers are the symbols of notions, therefore we may learn something about the notions from Katz's views on the markers. One may draw conclusions on the relations between notions on the basis of the markers, in view of the statement of Katz himself: semantic relations are expressed with the use of semantic markers (Katz, Fodor 1964: 498). What is more, in one of his older works, Katz identifies the markers with theoretical constructs. We may assume that he means notions. After all, in a different place notions are such constructs for him. What does Katz therefore say of markers and their mutual relations? It is possible to create Boolean functions of markers (Katz 1966: 160); at another point Katz explains what he means. He creates the product and the object with the use of markers. He also creates a sum (Katz 1971: 116) and speaks of the relation of inclusion between the notions represented by the records of meaning, containing markers. From these remarks it seems to follow that according to Katz notions are certain classes or between notions there are such relations as are present between the classes in Boolean algebra interpretations. It is difficult to say whether, according to Katz, any other relations between notions may occur, since it is impossible to find out what relations occur

between notions when the markers being the symbols of the latter are put in brackets, as in the example, which I present below (Katz 1966: 167). The reason for this difficulty in determination of the relations between the notion is the lack of any specification of the role of the brackets. Below I present the abovementioned example of a dictionary entry.

chase → verb, verb transitive, ...; (((activity) (nature: physical)) of X), ((movement) (rate: fast)) (character: following)), (intention of X: (trying to catch ((Y) ((Movement) (Rate: Fast)))); <*SR*>.

Bearing in mind the comments added, one should read this entry in the following manner: the word *chase* is a transitive verb expressing the notion of activity of the physical object X, the notion of fast movement of the character of following something. This verb expresses the notion of the intention of the subject to catch y in fast movement. *SR* is the acronym of the expression "selection reading" and indicate a distinguisher.

It has been noted that the markers are to emphasize the semantic structure of the expressions. Katz does not say clearly, however, to what extent the semantic meaning of the expressions is to be emphasized by the markers. After all, one could limit oneself to the presentation of only the most general sketches of the structure of meaning. One may also go deeper into the greatest subtleties of the semantic structure. In the case of the word *bachelor* we may limit ourselves to noting that the meaning of the word includes the notion of a physical object, alive, male, adult or to determine precisely what the notions of life, maleness and adulthood consist of. It seems that Katz includes into a dictionary entry all and only those markers, which may affect joining of expressions in view of their meaning. Therefore it seems that among the markers we only have those which are present also in the selection rules for the combining of expressions, which will be discussed shortly.

5. The final point of a dictionary entry is the selection rule limiting the possibility of combining a given entry to a given meaning with other entries. I therefore omit in this paper the abovementioned distinguishers, which Katz does not mention in his later works. This guideline in a dictionary entry means this selection rule shall be shortly called a limiter. Katz calls it a "selective restriction" or "selective reading". The selection rules make it possible to recreate a known fact consisting therein that a word has usually many meanings in the dictionary, yet within a framework of a sentence this polysemy is limited or it vanishes altogether (Katz, Fodor 1964: 497-498). We therefore need to realize how from many meanings we move into the context of a sentence towards a smaller actual polysemy. Katz illustrates the

abovementioned disambiguation with the following example. The expression *is burning* is ambiguous dictionary-wise (*The house is burning* and *John is burning to work*). In the sentence *The house is burning* this expression is unambiguous. The reason for such disambiguation is the rule limiting the connectivity of the expression *is burning* (in the sense of oxidation) in such a manner that it may be connected only with expressions having in their meaning the notion of PHYSICAL OBJECT. In this sentence *is burning* was connected with the word *house,* whose meaning incorporates the notion of a physical object, i.e. in its dictionary entry contains the marker (PHYSICAL OBJECT). The fact that *is burning* within the meaning of rapid oxidation may be connected only with words whose meaning contains the notion of being concrete is marked by Katz with the use of the marker <SPECIFIC>. In the sentence *John is burning to work* the expression *is burning* is directly connected with *to work.* The meaning of the latter expression does not incorporate the notion of a physical object. Working is after all an activity. Therefore in this sentence *is burning* has a different meaning than in the sentence *The house is burning.* Therefore, by application of the selection rules, we eliminate some of the possible meanings. And if we do not observe the rule indicated by the restriction, then we will construct a grammatically correct sentence, yet it will be abnormal semantically. E.g. *bachelor* may be connected only with an expression containing in its reading the marker (SPECIFIC) (cf. the example on page 7). The word *number* does not have this marker in its reading and therefore the sentence *The bachelor is a number* is semantically abnormal and does not have a coherent meaning, which is demonstrated by the fact that it does not have a reading of its meaning. The rules of creation of these readings simply do not allow the joining of the word *bachelor* with the meaning of the word *number.* Therefore, there cannot be created a reading of a complex expression.

6. Katz does not only provide reasons why he introduced certain elements into dictionary entries, but also provides arguments as to why he did not put some other moments in the dictionary specification of the meaning of expressions. What he means is the omission of rules making the meaning of expressions dependent on both the paralinguistic, i.e. the situational context, as well as the purely linguistic context, exceeding the sentence in which a given word is placed. The sentence *John found a needle in the jug* is an example of a sentence where the meaning depends on the situational context. If we know that John was in prison, then *the jug* means prison. If, however, John was in the kitchen, then probably *the jug* means a kitchen vessel. Katz provides several arguments which made him omit these

rules. It seems however, that the most important reason for not taking the abovementioned rules into account was the intention of making semantics similar to grammar. The rules of grammar (in its transformative version, acknowledged by Katz), do not take the context into account. As it has already been said, grammar is to describe the skills of an efficient language user, allowing him to construct any correct sentences and recognize the correctness of any utterances. In Katz's opinion, a language user is able to recognize the correctness of the construction of a sentence, irrespective of other utterances, occurring either earlier or later (Katz, Fodor 1964: 484). This property of grammar is generalized by Katz over the entire linguistic theory. Therefore, also the semantic rules do not (potentially, should not—in this respect Katz is not clear) take the context into account (Katz, Fodor 1964: 484). Other arguments do not exclude radically from the semantics the rules making the meaning dependant on the context. A sentence in a context may obtain only some of the meanings, which it has in isolation. The context therefore makes a certain choice of meanings. Thus, semantics determining the full set of meanings of sentences is logically precedent with respect to semantics, which selects only certain meanings from this set. For this reason Katz's theory, making it possible to determine all meanings of a sentence, is at least logically precedent to semantics, which take the context into account (Katz, Fodor 1964: 488). In the opinion of the discussed author there is one more obstacle to develop contextual semantics. Namely, a theory taking into account the impact of paralinguistic contexts on the meaning that should dispose of means making it possible to describe all contexts available to the language user's knowledge and therefore affecting the meaning of the expressions. Therefore, such a theory should have the means to describe any situation (Katz, Fodor 1964: 488-489). It is impossible to systematize such vast knowledge. For this reason, a general and formal theory attempting to present the impact of the knowledge of the paralinguistic situation on the meaning of expressions is not possible (Katz, Fodor 1964: 489, 491). Katz allows the creation of a semantic theory taking into account the impact of the limited knowledge on the meaning of expression (Katz, Fodor 1964: 489). What makes it impossible to create a semantic theory linking the meaning of expressions with paralinguistic situations, also makes it equally impossible to create semantic theories making the meaning dependent on the language context (Katz, Fodor 1964: 490). This context simply provides certain knowledge of paralinguistic situations and may be as varied and as rich as the abovementioned paralinguistic contexts. If, however, we limit the language context only to the grammatical properties of the sentences

preceding (or succeeding) the sentence analysed in a given context, then the theory taking into account the context understood in this way is limited to the semantic theory proposed by Katz — at least he himself believes so (Katz, Fodor 1964: 490). The context understood in this manner may be presented as one long compound sentence (e.g. a conjunction), examined and parsed in the manner proposed by Katz.

7. Having discussed the dictionary determining the meanings of semantically simple expressions, Katz proceeds to determine the meaning of complex utterances, in particular sentences. The first step in this direction is to ascribe meaning to particular words, when they do not occur in isolation, but within the underlying phrase structure as its terminal symbols. Katz describes the underlying phrase structure as a derivative tree, emphasizing the grammatical structure of the utterance before subjecting the utterance (or rather the tree) to transformations. The terminology adopted by Katz, and making the use of the semantic use dependant on undertaking such or other grammatical actions, makes it clear that Katz's entire theory is organically based on the transformational grammar, which he adopted.

The matter of ascribing meaning to simple words occurring in the underlying structures is relatively simple. The only complication consists therein that the utterance analysed at a given time may have several different trees, which indicates the syntactical polysemy of a sentence (e.g. *we think and express thoughts with the use of words* is ambiguous in this manner). Word *m*, if it appears in phrase structure *d* of sentence *S,* is ascribed such dictionary meanings, which are connected in the dictionary with category *p*, occurring in structure *d*, in the node directly above word *m.* There may be numerous such meanings. In a case like this word *m* is ambiguous in such a context. The sentence where word *m* occurred may (although does not have to) be ambiguous as a whole. The ambiguity of the entire sentence may be multiplied, if word *m* has different syntactic categories in various phrase structures (Katz, Fodor 1964: 504-505). If we treat every word in the underlying phrase structure (or in the underlying phrase structures, if this is a syntactically ambiguous sentence) in the same abovementioned manner, then we receive a certain semantic semi-product, being a starting point for the projection rules, i.e. rules making it possible to compose a unified meaning (meanings) of a sentence from such unrelated meanings.

8. We shall start to combine meanings from the meanings of simple words, i.e. from the very bottom of the tree illustrating the underlying phrase structure of the sentence. The action of combining the meanings is mechanized. Katz puts great emphasis on the mechanisation of this

interpretational activity. He believes that the basic achievement of his semantics is the fact that it demonstrates that it is possible to mechanize the combination of meanings. Instead of referring to the language user's intuition and efficiency, Katz formulates rules, wherein he takes into account only the readings of the combined meanings. We combine meanings by simply putting together the markers corresponding to the combined utterances. The phrase structure of the sentence indicates which utterances should be semantically combined with one another. The combination of markers, i.e. certain signs, is a strictly formal matter, not involving any understanding of anything; it is sufficient to identify shapes and comply with the rules of combining these shapes. Therefore we combine meanings or words of relevant meanings through an operation on the markers. Finally, however, we obtain a combination of meanings. This happens in the following manner: let us assume that we are dealing with two utterances x and y, which in the underlying phrase structure of the sentence are placed in two neighbouring branches stemming from one branching node. One of these utterances is a head and the other is a modifier. Having these data we compose a meaning (with the use of combining semantic signs) of a complex utterance: *x with the following y* of the syntactic category marked in the branching node. The meaning derived this way is simply a composition of the meaning of the head with the meaning of the modifier, provided that the combination of the meaning of the head with the meaning of the modifier is not excluded by the limiter of the modifier. We add to the obtained compound, meaning the rule limiting the combining of the meanings. This rule in an unaltered manner is adopted from the meaning of head y (we simply ascribe the limiter from the semantic sign thereof). If the combined expressions have many mutually exclusive meanings, the complex expression has a number of meanings being the product of the number of meanings of one expression and the number of meanings of the second expression. In order to present Katz's thought more clearly, I hereby present a literal example provided by him as an illustration:

(Rule one) When we have two readings:

(R_1) (a_1), (a_2),..., (a_n); $<SR_1>$

(R_2) (b_1), (b_2),..., (b_m); $<SR_2>$

such that $R_1$is ascribed to node X_1, $R_2$is ascribed to node X_2, X_1 specifies grammatically the sequence of words being a superior expression, X_2 specifies grammatically the sequence of words being a subordinate expression, X_1 and X_2 are direct branches of node X, then the notation of the derivative meaning:

(R_3) (a_1), (a_2),..., (a_n), (b_1), (b_2),..., (b_m); $<SR_1>$

is subordinated to node X, since the limiter $<SR_2>$ is met by R_1 (Katz

1966: 166).

Multiple application of this and similar rules to longer sentence components in the end will result in ascribing meaning to the entire sentence.

Katz makes the reservation that other projection rules may considerably differ from the abovementioned rule (Rule 1). In particular, compound meaning does not have to be simply expressed by the sum of the markers of the combined expressions (Katz 1966: 167). Nonetheless, Katz provides neither a full set of projection rules nor a general structure thereof. From the examples provided however, it follows that they have the form of an inductive condition of recurrence reasonings (also definitions). The rules provided by Katz fall under a general scheme: if there are certain readings then, acting adequately, we may transform them into further readings. One may apply to the latter the rules on the composition of readings. The result obtained may then be combined again, and again and again, which proves the recurring character of these rules. Despite that, these rules are very generally formulated, since it has not been explained, what should the APPROPRIATE ACTIONS by creation of new readings mean.

Full interpretation of a sentence is limited, according to Katz, to ascribing meaning to particular semantically simple expression and then to determination of the meaning of more and more complex expressions, up to the determination of the meaning of the entire sentence. Full interpretation of a sentence also includes a semantic assessment of the sentence (Katz 1966: 170-172). This assessment consists in asserting whether a sentence is semantically normal (or not), whether it is clear or ambiguous, whether it is synonymous to other sentences or whether it is semantically excluded by them. In order to make this assessment formal, i.e. without resorting to intuition, Katz provides relevant definitions of the abovementioned notions. Since sentences may be syntactically polysemic, i.e. may be composed of several underlying phrase structures, and by each structure the assessment may be different, Katz first determines the semantic abnormality, ambiguity, etc. for particular phrase structures of a given sentence. He directs himself towards this purpose with the help of the definitions of abnormality etc. of the phrase structures of the (not necessarily proper) parts of a sentence.

Katz adopts the following definition of semantic abnormality:

D_1. If C is a part of the underlying phase structure of sentence S, then C is semantically abnormal, if and only if the interpreted structure C (i.e. the structure of ascribed reading) does not contain any element (Katz 1966: 171).

What this definition provides is that structure C has no coherent reading

expressing the meaning of the whole. This situation occurs for example, when structure C is composed of a superior and subordinate component, and the superior component in its reading does not have a marker required by the rule limiting the possibility of combining the expressions of the subordinate component. For example, in the sentence: "*A numerical bachelor is not married*," expression C "*A numerical bachelor*" is semantically abnormal, since it does not have any reading (and respectively does not have a coherent meaning). The rule limiting the possibility of joining the word numerical with other words should provide that this word may be combined only with words, which in their reading have the marker (ABSTRACT). The word *bachelor* does not have this marker. Therefore we cannot establish any meaning of the expression *numerical bachelor* and the reading of this expression is simply empty.

D_3. If C is a part of the underlying phase structure of sentence S, then C has n meanings, if and only if the set of readings ascribed to C has n elements (Katz 1966: 171).

The simplest example of an expression of structure C of sentence S is the following sentence S: *I see a conductor* (here C is the improper part of sentence S, i.e. it is identical with it). Under the entry *conductor* we find several meanings in an ordinary dictionary. In the dictionary constructed in accordance with Katz's proposal, we also find several readings. Adequate ascribing of these readings to the structure of sentence S will provide us with several readings of S. It is obvious that the set of readings of an expression has exactly one element, then this expression is unambiguous (D_2).

In definition D_4 Katz introduces the notion of synonymy of two expressions with respect to at least one reading. If both expressions have at least one reading in common, then they are synonymic with respect to this reading. When all readings of both expressions are identical, then the expressions are fully synonymic (D_5: Katz 1966: 171). Two expressions are different semantically, when each reading on one expression has at least one marker, which none of the readings on the second expression have (D_6: Katz 1966: 171).

On the basis of the abovementioned definitions Katz specifies the definition of sentence S which is semantically abnormal. Previously one has discussed generally any structures, presently we will speak only of sentences in their full surface structure. Sentence S is semantically abnormal, if the sentence components of all underlying phrase structures of sentence S are semantically abnormal (D'_1; Katz 1966: 172). A sentence is unambiguous, if all readings of the underlying structures of the entire sentence are the

same (D'_2; Katz 1966: 172). Definition of polysemy provided by Katz is very similar. It is also easy to analogously reconstruct the definitions of synonymy of two sentences and their semantic differentiation, which Katz did not provide.

Being equipped in the above definitions, making it possible to assess the meaning of sentences, Katz defines the semantic interpretation of a sentence in the following manner. Semantic interpretation of sentence S is a set of interpreted phrase structures of sentence S, in connection with the assertions on S, following from the above definitions and familiarity of the abovementioned interpreted phrase structures of sentence S.

III. APPLICATION OF KATZ'S SEMANTICS TO PHILOSOPHICAL PROBLEMS

According to Katz, his semantic apparatus makes it possible to distinguish fully correct sentences from sentences which are only grammatically correct. It also makes it possible to determine which sentences are semantically different from each other, which are synonymic, etc. In short — his semantic theory meets the conditions, which should be met by a good semantic theory (cf. I, 3 hereof). Katz propagates his semantics, not only by pointing to the already discussed advantages thereof, but also its usefulness in philosophy. At least on three fields his semantic theory is to materially contribute towards solving philosophical problems. According to Katz, his semantics is capable of explaining the nature of deductive reasonings based on analytical assertions. It is also capable of determining, which notions are indeed the highest categories. And finally, this semantic theory answers the question, whether notions are inborn or acquired by means of experience. Therefore, according to Katz, his semantics provides new points of view and arguments aimed at the solution of the most important philosophical problems (Katz 1966: 186-187).

A. On analytical sentences.

1. The condition of research concerning analytical sentences is highly unsatisfactory according to Katz. Carnap's attempts at determining these sentences are based on the notion of semantic postulates, which, according to Carnap, are totally conventional and do not have any distinctive features. Therefore analytical sentences could be any sentences. Since no semantic postulates have been presented in detail, then also the notion of an analytical sentence, based on the notion of semantic postulate, is practically deprived of a definition (Katz 1966: 50-53). The definition of the analytical sentences introduced by Leibniz, as true sentences has not the power of facts, but only

of reason, and does not explain at all why these sentences are accepted by us on the principal of mere reason; at most we ascertain the fact that analytical sentences exist (Katz 1966: 189). The explanation of this problem is provided by Kant and therefore his theory is the basis for the more technical of Katz's developments. Nonetheless, Kant's theory in its original version has two faults, which Katz attempts to remove, creating a concept free of the defects noticeable somewhere else.

Kant's understanding of analytical sentences is limited to noun-predicate sentences. This is the first nuisance of Kant's proposal. The Königsberg philosopher assumed that in an analytical sentence the notion expressed by the predicate is contained in the notion expressed by the subject. This containing of notions, according to Kant, may be determined solely with the use of proper reasoning. This solution seems obvious, since notions are mental beings and appear in thoughts only. Yet, this manner of determination of analytical sentences is erroneous, due to the ambiguity of the terms of "notion" and "containing of notions," "thinking." This haziness of the used expressions is the second negative side of Kant's proposal (Katz 1966: 189-190). Katz, following Kant, wants to eliminate this obscurity (Katz 1966: 190-191).

2. An introduction to the formal definition of analytical sentences, for now only of the subject-predicate construction, is the formal specification of the noun and predicate. At this point Katz uses the notional apparatus of the transformative grammar — since this is purely a grammatical matter (Katz 1966: 191, 192). I will not refer this first specification in view of its purely grammatical character. The next stage on the way to define analytical sentences is to create a definition of antonyms. Two expressions are antonymic, if their notions are mutually exclusive. For example, the following expressions are antonyms: a groom and a bride, an infant, a child, a teenager, an adult, etc. In the first example, the expressions are different with respect to the notions of gender connected with them: male and female. In the second example there are different notions of age. This kind of definition of antonyms does not satisfy Katz, since it is not formal and based on intuition. After all, nothing in the shape of these expressions or in the reading of these expressions indicates that the notions are mutually exclusive. In order to enable formal specification of antonyms, Katz slightly modifies the markers. E.g. instead of writing (*male*), (*female*), he introduces one marker for gender (G) and its modifications (G^m) and (G^f) of various upper indexes; in case of age these markers shall respectively be (A^1), (A^2), ..., (A^n). Analogically, the case will be in the case of colours (C^1), (C^2), ..., (C^n), i.e. for example

white is the first, yellow is the second, etc. Two markers are antonymic, if they have the same shape with the exception of varying upper indexes. Further expressions are antonymic (by a given interpretation), if they have antonymically ascribed markers (Katz 1966: 195-197).

These specifications are sufficient for Katz in order to provide a definition of a simple analytical sentence of the following construction "A is B". If R_1 is the reading of the subject and R_2 is the reading of the predicate of sentence S, then it is analytical only if every simple marker in R_2 is present also in R_1; if at least one M_i marker in R_1 (for $1 \leqslant i \leqslant n$), i.e. a marker being a component of a compound marker from R_2, corresponds to every compound marker in R_2 $((M_1)\ (M_2)\ ...\ (M_u))$, and finally in the reading of the subject, i.e. in R_1 there are no antonymic markers (the subject is not contradictory). Such definition of an analytical sentence differs from Kant's proposal, in that it is visually possible to check the analyticity of the sentence, by checking the reading of the sentence. Intuition here is totally unnecessary. Therefore, this is a formal definition. At the same time it is apparent that analyticity formulated this way is a particular case for semantic inclusion. The latter notion is more general, since it applies to any and all expressions, and not only to sentences, which is the case with analyticity. On the basis of the notion of semantic inclusion it is possible to define synonymy (the meaning of the first expression is contained in the meaning of the second expression, and the meaning of the second expression is contained in the meaning of the first, expression which is determined visually, by means of a review of the readings of both expressions), by avoidance of those difficulties, which were encountered by Fodor (1961) by his definition of paraphrase (Katz 1961, passim).

Without any greater difficulties Katz further defines a contradictory sentence of the construction "A is B;" this is a sentence about a subject whose reading does not contain any antonyms and has a marker, which is contained in the predicate. If, however, the subject of an "A is B" sentence does not contain any antonyms, but the sentence is neither analytical nor contradictory, then the sentence is synthetic (Katz 1966: 198-199).

Katz tries to prove the aptness of those definitions indicating that between analytical and syntactical sentences there are relations, which we determine between these sentences by means of feeling and intuition. We then consider a negation of an analytical sentence to be a contradictory sentence, and a negation of a contradictory sentence to be an analytical sentence. Negation of a synthetic sentence is also synthetic. In order to prove these relations between the types of sentences, Katz needs to define negation,

and he does so with the use of the definition of an antonymic operator. By means of this operator Katz builds marker objects. If instead of marker (Z^i) we enter the sum of its antonyms, then this sum is a marker object. This operation is marked with the following notation $A/(—)$, where the place of the dash may be taken by any reading. If we, for example, have marker (Z^3), which let us say is (*green*), then $A/(Z^3)$ is the sum of antonyms, i.e. (*red*) (*blue*) (yellow) ... (Katz 1966: 199-200). The negation of the sentence is created by means of relevant transformation of the sentence's predicate, consisting mainly in the introduction of marker objects in the place of the markers of the predicate of the negated sentence, i.e. by performance of the operation $A/(—)$ on the markers of the predicate. Similarly, it looks different in an analytical and a synthetic sentence. If in a synthetic sentence subject S and the predicate are not contradictory (i.e. we are indeed dealing with a non-contradictory sentence), and the predicate contains markers appearing in the subject but contains also the markers absent from the subject (in fact we are dealing with a synthetic sentence), then latter markers will be replaced by marker objects, and we will thus create a negation of sentence S. This rule of negation creation has the following full form in Katz's theory: If (1) the markers of the subject are (X_1), ... (X_n); the markers of the predicate are (Y_1), ... (Y_n); the notation $(X) = (Y)$ indicates the identity of markers and the expression $(X)\ A\ (Y)$ indicates that (X) and (Y) are antonymic; (2) there are no (Y_1) for $1 \leqslant i \leqslant m$ such that $(Y_1)\ A\ (X_1)$ for $1 \leqslant j \leqslant n$, but there are (Y_1), (Y_{i+1}), ... (Y_{i+k}) for $k \geqslant 0$, such that for each () for $i \leqslant v \leqslant i + k$ there is a relation $(Y_i) = (Y_j)$ and there are (Y_1), (Y_2), ... (Y_{i-1}), (Y_{i+k+1}), ..., (Y_m), such that no (Y_h) for $1 \leqslant h \leqslant i - 1$ *or* $i + k + 1 \leqslant h \leqslant m$ is not such that $(Y_h) = (X_j)$ or $(Y_h)\ A\ (X_j)$, then replacement of (Y_1), (Y_2), ... (Y_{i-1}), (Y_{i+k+1}), ..., (Y_m), with $A/(Y_1)\ (A)\ (Y_2)$... $A/(Y_{i-1})\ A/(Y_{i+k+1})$ ... $A/(Y_m)$ results in a negation of the initial sentence.

The rules of negation of a contradictory sentence is simpler: if the markers of the predicate are antonyms of the markers of the subject, then the former is replaced by the sum of their objects. The markers of the predicate, different from the markers of the subject and not being their antonyms are simply left out (replaced by a zero marker). The original formulation of this rule in Katz's theory is as follows: If there exist (Y_1), (Y_{i+1}), ... (Y_{i+k}) for $l \leqslant i \leqslant m$ and $k \leqslant m$, such that each (Y_{iv}) for $i \leqslant v \leqslant i + k$ is such that $(Y_{iv})\ A\ (X_j)$, then (Y_1), (Y_{i+1}), ... (Y_{i+k}) is replaced by $A/(Y_1)\ A/(Y_{i+1})$ ... $A/(Y_{i+k})$. Each (Y_g) for $1 \leqslant g \leqslant i - 1$ or $k + 2 \leqslant g \leqslant m$ is replaced by the zero element, provided additionally that $(Y_g) \neq (X_j)$.

An even simpler rule governs the negation of analytical sentences. If every marker of the predicate is identical to some marker of the subject, then the markers of the predicate are replaced by the sum of their objects. In the initial form this rule was as follows: for each (Y_i) for $l \leqslant i \leqslant m$ $(Y_i) = (X_j)$, then (Y_1), (Y_2), ..., (Y_m) are replaced by $A/(Y_1) \ldots A/(Y_m)$. (Katz 1966: 201)

Katz binds these rules together and treats them as one rule of negation for "A is B" sentences. Thus the conditions and specifications indicated by the first rule remain in force in the two remaining cases.

Specification of negation makes it easy for Katz to indicate that negation of an analytical sentence is a contradictory sentence. If in an analytical sentence we replace the markers of the predicate with their antonyms (and to be more precise: with the sum of their objects), then since the replaced markers are repeated in the object, we obtain a contradiction: in the predicate after the replacement we will find the antonyms of the markers of the subject. If in a contradictory sentence we replace the markers of the predicate with their antonyms, then we receive an analytical sentence. In Katz's theory there is the following rule governing the marker objects: $A/A/(Z^i) = (Z^i)$. Therefore, replacement in a contradictory sentence of the markers of the subject with the object markers results in the fact that there are subject markers in the predicate. Finally, in a synthetic sentence the predicate has markers which are not identical with the markers of the subject neither are they the antonyms of the latter. Replacement of these markers of the predicate with the sum of their marker objects results neither in their contradiction nor analyticity. Therefore, synthetic sentences are created by negation of synthetic sentences (Katz 1966: 202-205).

4. Another step made by Katz towards a better version of Kant's theory is a more general (not fully general though) definition of an analytic sentence. The previous definition of an analytic sentence was based only on the construction of "A is B" sentences. We will now speak of the analyticity of conditional sentences, whose clauses are of the "A is B" construction. Such conditional sentences are analytical, if the markers of the subjects of the postcedent are contained in the set of the markers of the subjects of the antecedent, and if the case is the same with the markers of the predicates, and when the subjects do not contain antonymic markers (Katz 1966: 206). The above definition assumes of course purely grammatical differentiation of conditional sentences from other compound sentences.

Apart from those two definitions of analytical sentences Katz provides a third definition pertaining to sentences, where the subject implicitly contains

a sentence, which for example is the case in: *A man who bought a horse, bought something.* Analytical sentences are of this kind, when the reading of the main sentence (in the example: *a man bought something*) is contained in the reading of the subordinate attribute clause (in the example: *who bought a horse*) (Katz 1966: 208-209). Other analytical clauses have not been defined by Katz, treating the provided definitions as illustrations demonstrating the possibilities offered by his semantic theory.

Based on the definition of an analytical conditional, Katz provides a definition of the propositional resulting in: sentence S_1 entails sentence S_2, if and only if there is an analytical conditional of the precedent S_1 and postcedent S_2 (Katz 1966: 205). Expanding his semantics Katz introduces a more general notion of contradiction, referring to the last notion of analyticity. A compound sentence is contradictory, if the predicate of the main sentence contains markers, which are antonyms of the markers of the subordinate attribute clause. In view of the latter definition of contradiction the following sentence: *Persons who are old are young* is contradictory.

The so-called problem of analytical sentences includes not only the issue of defining the latter, but also the question, whether analytical sentences together with contradictory and synthetic sentences exhaust the set of the sentences of a given language. This issue is resolved by Katz negatively. Apart from semantically abnormal sentences (although they are grammatically correct), and apart from analytical, contradictory and synthetic sentences, Katz introduces undetermined sentences and sentences which are metalinguistically true or false. Therefore, according to Katz, the most common divisions of sentences are not exhaustive and therefore, incorrect (Katz 1966: 211).

Undetermined sentences have contradictory subjects, e.g. *Men of female gender are stingy.* According to Katz one is unable to say that they are true, neither is one able to say that they are false. Since according to the theory of our author a sentence is true or false, depending on the fact, whether it adequately or inadequately ascribes features to the object, which is designated as the object of the sentence. Therefore, if the subject of the sentence is contradictory and means nothing, this sentence cannot have any logical value, and therefore is logically undetermined (Katz 1966: 211-212). Yet not all sentences with a void subject are undetermined. Only those sentences are undetermined, whose subject is contradictory, i.e. the markers ascribed thereto are antonyms. Sentences of void subjects purely and empirically, e.g. *The golden mountain is high,* are synthetic (Katz 1966: 214).

Katz was forced to introduce undetermined sentences in view of the concept of the truth he adopted. The notion of truth appears in his deliberations somewhat accidentally: Katz does not provide a definition of this notion, he claims that semantics cannot deal with the relation of expressions to reality, i.e. it should also not deal with the truth. Therefore Katz provides further arguments in support of the introduction of undetermined sentences. And thus, basing on the general intuition with respect to analyticity and contraction, some of the sentences with contradictory subjects need to be classified at the same time as analytical and contradictory sentences. For example, the sentence *A queen being a man is a man* contains in its reading the markers which the subject has (therefore this should be an analytical sentence). At the same time the reading of the predicate has markers which are antonyms of the subject markers. Therefore, this should be a contradictory sentence. Katz avoids these complications by indicating in the definitions of analytical and synthetic sentences that the subjects cannot be contradictory. This way a group of sentences is created which is outside of the previously adopted definitions, i.e. the category of undetermined sentences (Katz 1966: 215).

Apart from all these types of sentences Katz also introduces metalinguistically true sentences. If one says that a given sentence S has a certain semantic quality, and its semantic interpretation meets the criteria of the definition of the said semantic quality, then the utterance in sentence S is metalinguistically true. Metalinguistically true sentences constitute a group of sentences which are not analytical, but are still true on the basis of generally binding rules of the language. From the above it follows that analytical sentences are not the only sentences whose veracity is determined by linguistic rules. It needs to be added that for Katz, metalinguistically true sentences belong to the same language as the analytical or synthetic sentences and the sentences of which one may say that they are metalinguistically true (Katz 1966: 220-223).

B. Notions in Katz's semantics.

1. Katz believes that his semantics is a good basis for solving the old problem of categories, i.e. the most important kinds. Above all, Katz accuses the previous attempts at determination of the categories and the number thereof of indefiniteness. Aristotle claims that the most general answers to the question *What is X?* contain the names of the categories. Such a determination of the categories is faulty in Katz's opinion, since as a rule the answers to such questions are based on intuition. A similar intuition is necessary for determination of the generality of the answer. Lack of formal criteria allows freedom, of which Aristotle is already accused by Arnauld

(Katz 1966: 226). It has not been explained why in all languages there are the same categories and why we are dealing with the categories that we know and not with any other categories (Katz 1966: 227). Moreover, it has not been determined what relations occur between the categories and what is the relation between them and other grammatical structures.

As it has already been noted, in the readings each semantic component is ascribed with a marker. If we compare the readings of many words it will turn out that these readings manifest certain irregularities. And namely, each dictionary item with, for example, the marker (*human*) also has the marker (*physical object*). Simply, the marker (*human*) entails the necessity of the appearance of the marker (*physical object*). Since the above is always the case, it is possible to leave out the marker (*physical object*) in many dictionary items, provided these items have the marker (*human*). In Katz's opinion such an omission perfectly simplifies the dictionary and reduces its volume. Nonetheless, it is impossible to totally resign from the markers entailed by other markers. The reason for this is due to the rules of restriction for the joining of meanings. These rules may be fully used only if an expression is equipped in a full reading. For this reason, abbreviated dictionary entries of meaning need to, in the course of semantic interpretation of a sentence, be extended to the full form. Extension of the abbreviated forms is effected in accordance with the following rules: $(M_1) \vee (M_2) \vee \ldots \vee (M_n) \rightarrow (M_k)$, where the markers from the first to the n entail marker (M_k), which is different from the others. Rules such as this type make it possible to introduce marker (M_k) back into the reading (Katz 1966: 231-232).

The marker reduction rules make it possible to formally determine the categories of a given language: these are the notions symbolized by these markers, which are present on the right side of the markers omission rules and never appear on the left side thereof. The categories which are shared by all languages, and are the universal categories of the language (Katz 1966: 235). These categories are discussed in the general theory of language and constitute the propositional universals of the language theory, supplementing the formal universals of language, which provide a general shape to the language rules (Katz 1966: 228). The categories of the language make it also possible to make the language description more concise, since they make it possible to introduce to the language theory the reduction rules, which even allow for the omission of the categorical markers of particular languages. Therefore, in the description of particular languages it is not necessary to introduce certain reduction rules, since they are already present in the general theory of language (Katz 1966: 235).

In Katz' opinion the categories which he introduced have an advantage over the categories introduced by Aristotle. Katz's categories are closely connected with the theory of language; they are aimed at determination of meanings. The relations between the categories and other notions are known. In particular, it is important that it is known which categories (or rather categorial notions) are contained in the notions being the meanings of the dictionary entries. It is also clearly visible how the categories are connected with the interpretation of sentences (cf. the paragraph on the rules limiting the combining of meanings) (Katz 1966: 238-239). This issue is considered by Katz together with the issue of inborn ideas (Katz 1966: 239).

2. Katz believes that the semantics he created makes it possible to make a material contribution to the resolution of the dispute between empiricism and rationalism. In his opinion empiricism acknowledges human inborn capabilities to get to know the world. Nonetheless, these capabilities are poor. The difference between empiricism and rationalism consists therein that the latter much more precisely determines the methods of creating notions: according to rationalism, the mechanisms of the creation of notions are richer (Katz 1966: 240). The creation of notions according to empiricists consists solely in the association of the experienced material and in inductive generalisation of these associations (Katz 1966: 241-242; 247-249). According to empiricism there are no other mechanisms for the creation of notions. Therefore, the idea assumed by empiricists is the association of simple ideas. Katz believes that the dispute concerning the genesis of notions may be resolved by means of examination, whether by means of association and inductive generalisation we may obtain all the notions which we actually use (Katz 1966: 246-250). The information from this part of linguistics which deals with acquisition of language skills is useful for the resolution of the dispute between empiricism and rationalism (Katz 1966: 246-247). In this section of linguistics we consider whether a human being is capable of acquiring all the skills to create sensible sentences, i.e. all the skills of creating meanings, i.e. notions, having at one's disposal only this simple notion generation mechanism, which is, in Katz's opinion, allowed by the empiricism.

What is empirically available for a child learning how to speak are the sentences uttered by adults and the situations, in which this takes place. A child learns the sentences in their final form, i.e. they reach the child in the surface structure (Katz 1966: 251). In the transformational grammars it has been assumed that the knowledge of the transformative history of a sentence, i.e. the knowledge of subsequent transformations of a sentence,

affects the process of reaching the sense thereof. The method of learning the meaning of the sentence is therefore decided also by some of its unobservable features, not demonstrated in the surface structure, i.e. the transformations made. Observation of the surface structure does not therefore guarantee learning of all important language elements. The empiricists would like to avoid this conclusion claiming that they learn the meaning of sentences whose sense is entirely dependent on the surface structure. Furthermore these sentences are the equivalent to such sentences whose sense is dependent on the underlying phrase structure. Therefore, in this way they are also able to indirectly reach the meanings depending on the transformation. This argumentation, in Katz's opinion, is not correct. How can it be possible to determine the equivalence of sentences, when on the basis of this equivalence one is to determine the meaning of one of these sentences? (Katz 1966: 260). According to Katz, taxonomical grammars are based on empirical assumptions. They use only the method of language facts observance and their inductive generalisation, which is an imitation of the methods of speech and language acquisition prescribed by the empiricism. Since within the framework of taxonomical grammars it was not possible to even determine the syntax of the examined languages, this is indicative of the failures of empiricism (Katz 1966: 252).

As it has already been said, according to empiricism, the only way to determine meanings are through their associations binding the expressions with the circumstances of their use. Since however, the meaning of the expressions contains meaning (notional) moments, which are not expressed in the surface structure, it is impossible to determine these elements by means of their association with the expression (Katz 1966: 250). Thus, where do these meaning moments, i.e. notions, come from? They cannot be taken from experience, because they would not have been created by means of association. According to Katz, this is an argument in favour of the existence of inborn notions, which are not created by association from empirical data.

To the disadvantage of empiricism Katz also presents N. Goodman's reasoning, which results in paradoxical conclusions. If all sapphires encountered up to the time t were green, then this allows a general conclusion that each sapphire is green. However, we are allowed to introduce the following definitional agreement: a sapphire is grue (from *green* and from *blue*), if up to the time t all sapphires were green, and from time t all sapphires were blue. The hitherto observations (i.e. observations made up to the time t) allow us to accept the following conclusion: each sapphire is grue, which leads to a further conclusion that the sapphires noticed after time t are blue. The latter

statement is however contradictory to the previous conclusion stating that each sapphire is green (Katz 1966: 262). In Katz's opinion, the difficulties of the inductive reasonings discovered by Goodmann (their solutions are unsatisfactory for Katz) are manifested particularly clearly by language acquisition: simply by undertaking inductive actions it is impossible to learn the language regularities.

Finally Katz emphasizes that by means of association it is impossible to understand and explain the multitude of relations which occur between the meanings. It is not visible, how to determine the inclusion of notions, the difference in meaning (notional difference), exclusion of meanings, etc. The association means and mechanisms are too poor in order to receive the entire richness of the relations between the notions (Katz 1966: 266-267).

Therefore, finally from the data provided by the senses, with the help of the mechanisms of association and inductive generalisation, i.e. with the help of what is allowed by empiricism, it is impossible to fully recreate all human language skills.

After the criticism of empiricism Katz presents the advantages of his theory. The starting point for his theory of inborn ideas is what Chomsky said about language acquisition. We acquire a language, we learn its structure, as if we were creating a theory. We postulate hypothetical theories on the basis of previous knowledge. There is no necessary relation of resulting, leading from data to the theory. If the theory is created by an act of creative invention, we verity its value by inferring empirical consequences therefrom. If we find empirical material consistent with those consequences, the theory is confirmed and its probability grows. If the empirical data are inconsistent with the consequences of the assertions of the theory, the theory in its present form is refuted. The process of speech acquisition is to be similar. A child, on the basis of the available language material, builds hypotheses concerning language structures. Then it instinctively predicts the possibility of the occurrence of future specific language actions of adults or predicts a reward in the form of being understood, if the child starts to express itself in a certain manner. These anticipations and equivalents of the consequences inferred from the theory are constantly confirmed or refuted by new language experiences of the child. Initial hypotheses are falsified and the child needs to adopt new, more elaborate language hypotheses.

Katz adds a supplementation to Chomsky's theory. A child at the beginning of the language acquisition process does not have any material allowing itself to build hypotheses concerning the language structure. Since the child's language activity must start from certain initial language hy-

potheses, these hypotheses need to be inborn. These inborn hypotheses are of general character and set the structure of other particular hypotheses. Katz claims that at least three types of language data are inborn. And thus what is inborn are the formal universals, specifying the general form of phonetic, syntactic or semantic rules. Formal universals also specify the form of the system of the previous rules. Moreover, propositional universals are inborn, and they set the cognitive apparatus for formulation of specific language hypotheses (Katz 1966: 276). The universal categories also belong to this apparatus (Katz 1966: 279). Finally, what is also inborn is the mechanism for the selection of language hypotheses. It is necessary in order to select the best, i.e. the simplest theory, from among several hypothesis equally well explaining the language facts. The latter inborn apparatus is therefore a mechanism measuring the simplicity of the hypotheses (Katz 1966: 277).

Such a rich set of inborn data makes it possible, in Katz's opinion, to explain why the languages are the way they are. In particular the included inborn data make it possible to explain why language universals, i.e. features common for all languages, exist. According to Katz the living conditions of humans, their beliefs and experiences differ from each other to such an extent that it is impossible for them to be the basis of the uniformity of languages (Katz 1966: 272). All the more, the uniformity of languages cannot be explained by various specific skills of individual human beings. If one accepts the existence of inborn ideas, then this all may be simply explained. Katz believes that his solution is consistent with Kant's theory. The relation of Katz's semantics with Kant's philosophy is demonstrated the most by the assessment of the a priori synthetic sentences. The inborn language rules are not analytical, since they do not match the definitions of analytical sentences. At the same time, these rules are neither contradictory nor undetermined. Therefore, they have to be synthetic. The inborn rules are in an obvious way a priori to the extent to which they precede experience. In this sense Katz therefore assumes the existence of synthetic a priori sentences (Katz 1966: 280). Moreover, Katz assumes that the inborn schemata are necessary in one of the possible senses. What follows therefrom, Katz assumes the existence of synthetic a priori sentences (and judgments) within the full meaning envisaged by Kant. Katz argues in favour of the necessity of the inborn rules in the following manner. In the case of inborn language rules, we will not find such empirical data, since the rules under discussion are the criteria for what is linguistic. Everything that is inconsistent with them is not language material (Katz 1966: 281-282).

In Katz's opinion, his semantics makes a considerable contribution,

namely it provides a number of remarks justifying innatism and the thesis on the existence of necessary synthetic knowledge.

IV. ADVANTAGES AND FAULTS OF KATZ'S SEMANTICS

1. The attempt at the formulation of a new semantic presented by Katz is far-reaching and closely connected to language practice. The construction of a dictionary entry, which he proposes, is very similar to the actual constructions which we encounter in dictionaries. This is an attempt which is also purely linguistic by the fact that it is not based on any psychological, logical or philosophical theories. This attempt is very original. Probably its fundamental advantage is the fact that it allows us to assess the semantic properties of sentences without resorting to intuition, and — what is more — it provides a simple algorithm allowing this assessment in a mechanical and effective manner in a finite number of steps. Thanks to such a solution, determination of semantic properties of expressions does not need to be based on arguments. And it is obvious that conducting arguments depends on creative invention, on intuition and similar intangible factors. The only simple thing is to verify the correctness of the ready arguments.

There is a clear tendency visible in Katz's construction aimed at making the theory practical. Katz does not only want beautiful theories, but he wants to be able to obtain practical results on the basis of his theory, to be able to "calculate" the semantic features of particular utterances, and to be able to predict on the basis of one set of data other semantic properties of expressions. Katz's semantic theory is distinguished from other semantic concepts of the natural language properties by a much greater precision. At the same time, Katz's semantics does not fall in a reverse trap, consisting in sacrificing empiricity of the deliberations in favour of purse exactness, which then assumes the form of a detached feature, realised in the research purely in order to satisfy the aesthetic needs of the researchers.

2. Many of Katz's claims and proposals however raise doubts or it is simply impossible to agree with them. Katz's semantics is based on the generative transformative grammar. It seems that Katz believes that his semantics is also generative and synthetic, since in many places he says that he wants to describe the competencies of the speaker and not to recreate the competencies of the recipient (cf. e.g. Katz 1966: 115). It might seem that Katz will show how the speaker GENERATES semantically sensible utterances. In practise, however, in Katz's works we encounter rather a program for analysing ready utterances. The semantic rules are in Katz's opinion of purely interpretational character (Katz 1966: 111). We ascribe

meaning to particular branches of a complex tree, illustrating the underlying phrase structure of the sentence. Therefore, we are initially dealing with a fully grammatically complex sentence (although before the transformation). In the subsequent interpretational step we ascribe meaning to the elements of the ready sentence structure. Such semantics can be comprehended only as analytical grammar, describing the skills and competencies of the recipient, who receives at his disposal ready sentences and is able to determine their meaning, since it seems impossible for the person generating the sentence (the speaker) to firstly determine the full structure of the sentence and then later in the interpretational step to consider what meaning should the generated grammatical construction have. In fact, it seems to be the other way around: we have a certain thought, some bunch of notions, which we "dress" in a sentence structure. Generating a sentence is therefore controlled by what in Katz's semantics is the interpretation of the ready underlying phrase structure. If, therefore, Katz wants to provide an authentic synthetic and generative semantics, he cannot treat semantics as an interpretational operation. It is rather the syntax which will be of interpretational character. Of course in case of analytical grammar, it is indeed not the syntax but the semantics which is of interpretational character.

The special skills of the speaker are his abilities to depart from the previous meaning of the word and to ascribe a new sense thereto. This occurs in cases of generating new original metaphors. Every synthetic semantics must explain these important competences of the sender. Otherwise it will not be capable of explaining a considerable part of poetry, where new metaphors appear on a daily basis. It seems that Katz's rules are incapable of describing the process of ascribing new meanings to words. Yet, this does not depend on the manner of describing his semantics either as analytical or potentially as synthetic. Katz's semantics is based on the dictionary meaning of the words and simply does not contain any rules allowing new meanings to derive from words outside of the scope of their definition. The last remark pertains to Katz's semantics treated as synthetic semantics. If we perceive this semantics as analytical we will encounter the following difficulty. A word which was ascribed with a new meaning by the speaker by means of a metaphor does not have the reading of this meaning in the dictionary. Therefore, the recipient at the first stage of gaining understanding of a heard sentence needs to treat such word as senseless. At the second stage of recognition of the meaning of the entire sentence the recipient is able to determine the meaning of the hitherto senseless word, taking the context into account. Yet, Katz does not want to take into account the rules allowing

determination of the meaning of the word on the basis of the context. And thus Katz not only resigns from the possibility to describe a larger set of language user competencies, but even makes this task impossible.

3. Let us now look in detail into Katz's thesis, excluding from the semantics the rules which take the context into account. It seems that in this respect Katz's views have an even greater stain than previously, since calling his semantics synthetic rather than analytical entailed no greater practical consequences. It simply turned out that Katz's semantics needs to be supplemented by an authentic synthetic semantics. As it has already been said, exclusion of the linguistic and semantic context from Katz's deliberations makes it impossible to realize important generative competencies of language users: namely their ability to ascribe new meanings to expressions with extra-definitional methods (cf. Lakoff 1971). Apart from that, not taking the context into account (or rather a prohibition on taking the context into account) makes it impossible to realise a further competence of a fluent language user. It consists in the ability to recognize the meaning of expressions which are constructed in a not entirely correct manner. In view of the significant number of mistakes which we all make when speaking (and writing), without this additional competence, it would be rather rare for people to communicate effectively. Our criticism of Katz's theory is supported by the mechanism of determining meanings account taken from the context. If we are dealing with a not entirely correct expression or with an expression whose certain components are incomprehensible for us, we do the following. The recipient assumes that the speaker within the framework of one utterance does not change the subject without a relevant signal, that the story presented by the speaker must describe a further course of events admissible in a given speaking convention and finally that the utterance is true. If the recipient knows what the probable course of events consists of, or knows the state of affairs, etc., then the understanding of some parts of the utterance instantly determines the understating of the remaining expressions uttered by the speaker. In such cases the recipient replaces the fragments unknown to him with understandable expressions until there emerges a true, probable or at least cohesive whole. This case is similar with incorrect utterances: the recipient modifies them (to possibly the smallest extent), so that they become correct and at the same time true or at least probable or only consistent with the rest. Each translator knows that this is what one does and that without the knowledge of a subject and without consequences for the translated author it is impossible to translate his work. In short — a perfect language user has to have greater competencies than those provided

by Katz. As a rule, these new competencies are connected with the use of the language and situational context.

All of the above objections against Katz's theory are presented by Uriel Weinreich (1971: 310-316). Therefore, there must be a lot to them, since the author of this article not being a linguist, reached the same conclusions independently from Weinreich, who is a linguist. Moreover, Weinreich notes, that jokes, which are often partly intentionally ambiguous and are therefore perfectly understood as fully semantically sensible, cannot be described with the use of Katz's theory. Weinreich suspects that Katz's semantics is simply a further elaboration of syntax, since Katz introduces semantic markers as those moments, which affect the way expressions are joint (cf. the remarks on the selection rules). Therefore, semantic markers make it possible to distinguish more subtle syntactic categories within the framework of traditional grammatical theories, hitherto included in the syntactical rules, which in turn makes it possible to infer more detailed syntactical rules. Weinreich also accuses Katz over the lack of rules concerning the order of the markers (it seems that the relations between them are interchangeable), which may result in the fact that the following sentences:

Cats chase mice.

Mice chase cats.

will have the same semantic notation.

Katz believes that semantics should not take into account the knowledge of the situational context of the uttered expressions, that it should not take into account the relations between the utterances and the reality at all, i.a. that it should not deal with the consistency of the utterances with the actual state of affairs, i.e. the veracity of the expressions. This conviction makes it impossible to develop his semantics any further. The source of this attitude is the view, very often expressed by linguists, that linguistics should deal with nothing else, but the language. According to this belief, examination of the relation between the language and reality exceeds the competences of linguistic semantics, since it necessarily needs to include descriptions of reality (the construction of the model). Katz says that linguistics cannot be the source of omniscience, that linguistics needs to have its specificity and cannot contain any information concerning the entire reality. And without this information, in Katz's opinion, it is impossible to create a referential semantics. This last sentence of Katz's is the source of the errors in his views. In order to determine, on the basis of the situational context, the meaning of one particular word, we also need a particular knowledge of the world. Determination of the meaning of words does not however fall within the

scope of the general semantic theory; this is a task for the description of a given language. In general semantics it is necessary to determine certain rules, according whereto it is possible to ascertain, what the meaning of given expressions is. Formulation of such general rules does not require the knowledge of the entire extra-language reality. For this purpose the most general knowledge of the structure of the world is sufficient, which is assumed by a semantitian-logician, who constructs a language model. Additionally, it needs to be noted that this is not the knowledge of the empirical world, but a kind of assumption: if the world has such a structure, then... In short — a linguist does not have to know the entire reality in order to provide rules taking into account the situational context. The knowledge of the structure of this reality is sufficient. Moreover, this does not need to be an actual knowledge, these may be assumptions concerning the structure of reality.

Katz's semantic theory, although it does not allow the inclusion of metaphorical expressions, is constructed in such a manner that the meaning of expressions is possible to determine in an effective way. This is not the case with semantics, which allows us to determine the meaning of the expressions on the basis of the context and the knowledge of reality. The procedure described above is clearly ineffective. This is a disadvantage thereof, although it describes the actual mode of conduct: the methods of meaning determination, which we apply in the course of an analysis of natural language utterances, are ineffective and therefore it is impossible to guess the meaning of the words we are dealing with.

Katz shows reluctance towards referential grammar due to the fact that referential semantics of logicians was not able to present the properties of natural languages in a satisfactory manner. The reason for this was to be the referentiality of this semantics. Katz's argumentation in this respect is particularly unclear and unconvincing. Referring to the word *game* and its propositional analysis made by Wittgenstein does not help much. There is no evidence that all natural language expressions have the same characteristics as the word *game*. What is more, Wittgenstein's analysis is not convincing either (Koj 1969). An explanation of such failures by logical semantics would be much simpler: it has never been conceived of as a semantics constructed for the purpose of explaining the properties of natural languages. The purpose was always to report the features of artificial languages. Secondary and derivative attempts at the application of logical semantics to the properties of natural languages could be in this case unsatisfactory (above all due to the poor syntax). Therefore, one cannot blame the logical semantics for not taking into account natural languages, since it was not created for this

purpose. It is even less substantiated to blame its referential character for this failure.

Despite Katz's abovementioned reluctance towards referential semantics, his final opinion on it is not clear. It is not known, whether at all he excludes the possibility of the construction of referential semantics for natural languages, or whether he finds it inappropriate for a linguist. If the latter was the case, there would be a chance to construct a semantics more general than Katz's semantics, without entering into a conflict with Katz's views and achievements. Otherwise (and there is more in support of understanding Katz in such a way) Katz's views would be an obstacle to the construction of full semantics. This obstacle should be overcome, i.e. one should demonstrate exactly and in detail the errors of Katz's theory.

4. Let us now look in more detail into the mechanisms introduced by Katz into semantics. His semantics is materially based on the data presented as dictionary entries. The origin of these data is very unclear in Katz's theory. On one hand he clearly states (Katz, Fodor 1964: 502) that the purpose of the semantics within the theory of language is not to create a method for the determination of the meaning of particular words, i.e. determination of the method of construction of a dictionary. Important problems of lexicography are therefore alien to his semantics. According to Katz, detection of meanings of words (connected with language acquisition) belongs to the theory of speech (Katz, Fodor 1964: 482). Detection of the meaning of words should therefore belong to what he calls the theory of performance, and not the theory of competence. On the other hand, by going into the matter of inborn ideas, Katz presents language acquisition as a process of generating and refuting subsequent hypotheses concerning the meaning of expressions and the projection rules. Do the deliberations concerning inborn ideas (universals) not belong to the theory of language, but the theory of language performance? Why therefore does Katz discuss these matters in a book being a treaty on the theory of language and why does he not clearly indicate that he is moving on to deliberations from another field?

These and other doubts are not, however, the weakest point of Katz's theory. More important is the fact that probably we would not be able to learn how to use the language, if the process of language acquisition was consistent with Katz's theory. A child encountering language material is dealing with many unknowns: incomprehensible words, unknown sequences of expressions and an unknown underlying phrase structure. Therefore, if a child in the process of language acquisition did not use the simple

possibilities provided by association, and it based its linguistic actions solely on generating hypotheses and the verification thereof, then both generation of the hypotheses, as well as the verification thereof would be of the utmost complicated, due to the abovementioned considerable number of variables and unknown parameters. The reasoning concerning several or more unknown factors is so complex that Katz's theory becomes improbable. In order to convince his readers, Katz would have to prove that there are not that many factors after all or that the human mind is able to process such vast amounts of information, which it needs to verify a hypotheses containing at least several unknown values. Potentially, Katz would have to prove that the process of language hypotheses generation in a child acquiring a language is gradual and therefore relatively simple. Yet, nothing has been done by Katz in this respect, therefore, Katz's hypothesis is totally unsubstantiated.

5. Katz strongly emphasizes that a good semantic theory should be a formally characterised theory. This is an admirable postulate. It is however highly doubtful whether Katz complies with his own postulate. His theory is much more precise than other semantic deliberations. Yet, it is far from being the ideal that Katz envisaged.

In a formally characterised theory each notion used needs to have a relevant axiomatic characteristic. This is unfortunately absent from Katz's theory. It lacks a general characteristic of the markers. A general characteristic of the markers does not consist in unofficial, non-technical comments which Katz presented in abundance. It should consist of assertions containing marker variables (and these have not been introduced by Katz at all). Neither does Katz define the symbol often appearing between the markers. What we mean is the comma between the markers, which in this context acquires technical meaning and requires a relevant formal characteristic. Since there is no such characteristic, it is not known, for example, whether it is admissible to change the order of the markers without the change of the semantic rule. The greatest failure of Katz's theory consists therein that it does not contain a formal remark stating that the markers are the marks for notions and not classes. In this respect Katz provides many informal comments, but nothing else. As a result, there is no axiom determining what the difference between a class and a notion is. Anyway, in the formally provided examples of rules Katz allows the signs of the sum of the product of the classes between the markers, i.e. between the alleged marks of the notions. After all, the notions, in Katz's theory, are not experiences but theoretic constructs, whose advantage simply consists in the fact that they make it possible to reach empirically verifiable conclusions. Therefore, if the

markers of the notions were treated as symbols of classes, we would obtain a semantic theory much closer to the known referential semantics. Moreover, it would be consistent with all of Katz's theoretical arguments. Only his informal and more philosophical remarks would not be met.

What is disturbing is Katz's attitude to the rights of logic, in particular their translatability into natural language utterances. One is bound to agree that a person who knows a natural language and the language of the narrow functional calculus will be willing to agree that the following sentence: *Any person who is a woman and is not a woman is generous* has the following logical structure: $\pi_x[(fx \wedge fx) \rightarrow gx]$. The latter sentence is a right of logic and therefore is an analytical sentence. Yet, according to Katz the above sentence of natural language is undetermined and has no logical value. It is not an analytical sentence. Katz notices this problem (Katz 1966: 216-217) and simply states that $\pi_x[(fx \wedge fx) \rightarrow gx]$ is not a correct translation of the sentence *Any person...* Which translation is therefore correct? Does Katz not question thereby the competencies of the users of both of these languages, i.e. the competencies, which his theory should accept as data and explain them?

Moreover, Linsky (1972) notes that from the sentences which in Katz's opinion are analytical there follow undoubtedly synthetic sentences (synthetic also in Katz's understanding). Namely, from the following sentence: *A spinster is a woman* (analytical sentence) according to Katz's understanding of resulting follows the sentence *A certain person is a woman*, which in Katz's view is a synthetic sentence.

These and similar difficulties raise doubts as to whether Katz's definitions concerning analyticity, resulting, etc. are apt.

Finally, it would be expedient to provide some remarks on Katz's philosophical views. They are the weakest parts of the book. Identifying empiricism with associationism and inductionism is a gross misunderstanding. Katz's argumentation, which is to demonstrate the existence of something inborn is very unclear. We actually do not know, what is inborn in a human being: abilities, mechanisms, notions or schemata. All of these terms are used by Katz. Are these synonyms? In order to acknowledge the value of Katz's ideas, one would have to clearly distinguish the linguistic contents of his book from the philosophical interpretations. A criticism of the latter was provided by A. Schaff (1972: 96-102) and one should resort to his book with respect to Katz's philosophical remarks.

Bibliography

1. Fodor, Jerry A. (1961) "Projection and Paraphrase in Semantics." *Analysis* 21[4]: 73-77.

2. Katz, Jerrold J. (1961) "A Reply to "Projection and Paraphrase in Semantics." *Analysis* 22[2]: 36-41.

3. Katz, Jerrold J. (1964) "Analyticity and Contradiction in Natural Language." In *The Structure of Language. Readings in the Philosophy of Language*, Jerry A. Fodor and Jerrold J. Katz (eds.). Englewood Cliffs: Prentice Hall.

4. Katz, Jerrold J. (1966) *The Philosophy of Language*. New York: Harper and Row.

5. Katz, Jerrold J. (1971) "The Philosophical Relevance of Linguistic Theory." In *The Philosophy of Language*, John R. Searle (ed.). Oxford: Oxford University Press.

6. Katz, Jerrold J. and Jerry A. Fodor (1964) "The Structure of a Semantic Theory." In *The Structure of Language. Readings in the Philosophy of Language*, Jerry A. Fodor and Jerrold J. Katz (eds.). Englewood Cliffs: Prentice Hall.

7. Katz, Jerrold J. and Paul M. Postal (1964) *An Integrated Theory of Linguistic Descriptions,* Cambridge: MIT Press.

8. Koj, Leon (1969) "On Defining Meaning Families." *Studia Logica* 25: 141-150.

9. Lakoff, George (1971) "Presuppositions and relative well-formedness." In *Semantics. An Interdisciplinary Reader in Philosophy, Linguistics and Psychology*, Danny D. Steinberg, Leon A. Jakobovits (eds.). Cambridge: Cambridge University Press.

10. Linsky, Leonard (1972) "Analytic/Synthetic and Semantic Theory." In *Semantics of Natural Language*, Donald Davidson and Gilbert Harman (eds.). Dordrecht: Reidel.

11. Martin, Robert L. (1971) "Some Thoughts on the Formal Approach to the Philosophy of Language." In *Pragmatics of Natural Language*, Yehoshua Bar-Hillel (ed.), 120-144. Dordrecht: Reidel.

12. Quine, Willard Van Orman (1972) "Methodological Reflections on Current Linguistic Theory." In *Semantics of Natural Language*, Donald Davidson and Gilbert Harman (eds.), 442-454. Dordrecht: Reidel.

13. Schaff, Adam (1972) *Gramatyka generatywna a koncepcja idei wrodzonych*. Warszawa: KiW.

14. Weinreich, Uriel (1971) "Explorations in Semantic Theory In Semantics." *An Interdisciplinary Reader in Philosophy, Linguistics and Psychology*, Danny D. Steinberg, Leon A. Jakobovits (eds.). Cambridge: Cambridge University Press.

Teresa Hołówka

THE LOGICAL SUBJECT OF A SENTENCE BY KAZIMIERZ AJDUKIEWICZ

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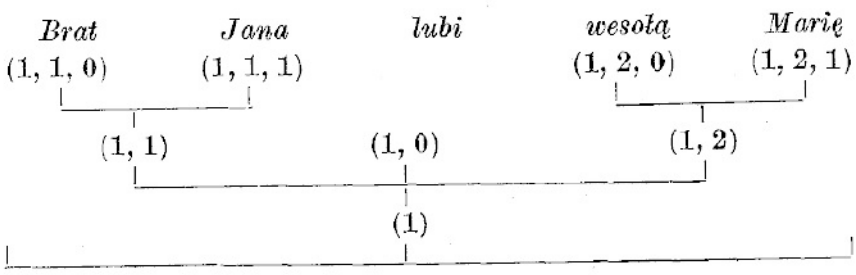
The concept of the "logical subject of a sentence" is closely connected with such fundamental and controversial semiotic issues as the criteria of natural language syntactic and semantic category identification, making a distinction between individual and general names, between proper names and common names and descriptions, the indicative and predicative function of expressions, etc. What is also important — on account of the possible interpretations of the expression "be eligible for the logical subject of a sentence" — is the issue of the nonsense and substitutability of expressions in sentential contexts.

The logical subject is usually juxtaposed with and characterized by, at least, an indirect reference to a grammatical subject. However, there is no consensus on these among linguists. Even within a particular ethnic language it is difficult to give such a characteristic of formal properties of some words and expressions that would distinguish a class of potential grammatical subjects of a sentence, particularly that these attempts to reconstruct syntax without making a reference to semantic issues end up in a failure. No wonder the notion of the logical subject of a sentence has not been sufficiently explicated yet. Ajdukiewicz's study (Ajdukiewicz1965: 344-355) is distinct in literature as it both gives an explicit definition of the subject (while most authors restrict themselves to providing vague suggestions) and very original tools for the analysis of colloquial speech (whereas logicians usually use traditional grammar coursebooks). Is the question of the subject sufficiently resolved in it? The basic syntactic categories in the dissertation

are the operator and the argument. "If an expression A lends itself to being brought down to expressions B and C_1, C_2....C_n, where the expression B refers to C_1, C_2 .... Cn respectively and makes them one whole, then we say that B is the main operator of expression A, with C_1 its first argument, C_2— second — and C_n — the nth argument" (Ajdukiewicz1965: 345, 346). Thus the sentence *Brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary] is factorized into the main operator — *lubi* [likes] — the first argument — *brat Jana* [John's brother] — and the second argument *wesołą Marię* [the cheerful Mary].

The main operator and its arguments create members of the first order in the expression A; in other words, they are connected to A by the relationship of direct syntactic subordination. They can be compound expressions, with the main operator and arguments. Then the first argument of the main operator of the sentence investigated here — the expression *brat Jana* [John's brother] — is then parsed into the operator *brat* and the argument *Jana*; the second argument — the phrase *wesołą Marię* [the cheerful Mary] — is parsed into the operator *wesołą* and the argument *Marię*. As we can see, each part of the k'th order of expression A is connected by the relationship of direct syntactic subordination with some member of a k-1'th order in the expression. The sequence of relationships of direct syntactic subordination that connects the member of a k'th order of expression A with the same expression is called by Ajdukiewicz the SYNTACTIC POSITION of this member in expression A. He introduces special symbols that enable the formulation of the syntactic structure of a sentence without the need to order the signs, as was the case in the purely positional language of syntax as presented in the previous tract *O spójności syntaktycznej* (Ajdukiewicz1960). The member of order 0, that is, the expression being currently analyzed, is designated with the symbol (1). If the syntactic position of any member in A is assigned the symbol (k), the syntactic position of the main operator of the member is designated as (k, 0), and the positions of subsequent arguments — with symbols (k, 1), (k, 2) .... (k, n). The sentence *Brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary] will thus be parsed as follows:



Its syntactic structure is expressed by the following:
(1,1,0) (1,1,1) (1,0) (1,2,0) (1,2,1)

Another step is the indication of the semantic categories of colloquial speech. Ajdukiewicz distinguishes between: individual names, that is, the "expressions that denote individuals," designated with the symbol "i", sentences, that is, "expressions that denote a logical value," that are designated with the letter "w", as well as functors — "expressions that denote functions, that is, such relationships that attribute an object (correlate) to any one, two, three, ... specific objects of a kind." Functors come in four classes: name-generating functors from name arguments, designated with the indexes $\frac{i}{i}$, $\frac{i}{i,i}$, ... (such as *wesoła* [cheerful]), sentence generating functors from sentential arguments, designed with the indexes $\frac{w}{w}$, $\frac{w}{w,w}$.... (such as *lub* [or]), sentence generating functors from name arguments, denoted with the indexes $\frac{w}{i}$, $\frac{w}{i,i}$ ... (such as *lubi*, [{he/she} likes]), and finally functor generating functors from functor arguments, as illustrated by the adverb głośno [loudly], which — related to a functor type $\frac{w}{i}$ (*śpiewa* [sings]) — forms a functor expression type $\frac{\frac{w}{i}}{\frac{w}{i}}$, such as *śpiewa głośno* [sings loudly]. We then append such a functor with the index . Following those initial settlements, Ajdukiewicz introduces the following definition: "If the main operator of the sentence belongs to the category $\frac{w}{i}$, and its only argument is an individual name (i), then the syntactic relationship between these will be considered ... the relation of predicate and subject" (Ajdukiewicz1960: 359). Along the lines of what has been said, an example of this kind of relationship could be the relationship that holds between the expression *śpiewa głośno* [sings loudly] and the expression Jan in the sentence *Jan śpiewa glośno* [Jan sings loudly].

There we are with three issues being posed quite clearly. First, which has been ignored in literature so far, is that "being a subject" does not mark a set of expressions or even their pairs; rather, it marks a set of ordered threes. Ajdukiewicz says that we cannot speak of any expression A that it

is a subject in general or that it is a subject of some sentence C. A decent formulation necessitates the expression "In sentence C, A remains towards B in the relationship of a subject to a predicate." Second, "being a logical subject" is not a purely syntactic relationship and neither is it a purely semantic one. It obtains between expressions marked by formal properties and some semantic functions. Third, only an individual name can be a logical subject: a proper name or a specific description. In sentences such as *Moje dzieci zachorowały na szkarlatynę* [My children have gone down with scarlet fever] or *Jeden z nich pojedzie do Jugosławii* [one of them will go to Yugoslavia] there is no subject-predicate relationship in a logical sense.

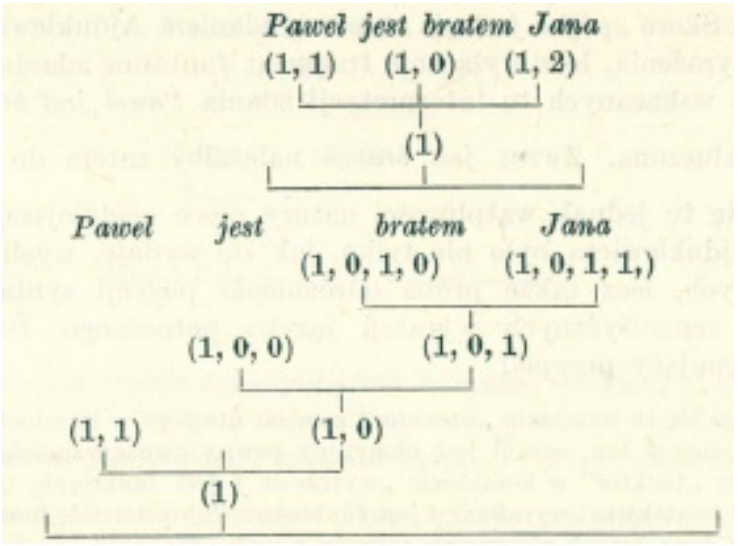
Ajdukiewicz's concept does not provide any sufficient criteria allowing the resolution of the issue of subject and predicate in the case of every sentence and the difficulties it encounters seem quite typical for the logical semiotics of a colloquial sentence.

Above all, the status of nominal predicates has not been presented consistently enough. On the one hand, the author treats the copular verb as the main operator of simple indicative sentences. It assigns the following structure to the sentence (Ajdukiewicz1960: 349):

Socrates est philosophus

(1,1) (1,0) (1,2)

It would follow that in comparison with the definition, in this sentence the subject-predicate relationship does not obtain as the main operator involves here, like in a sentence such as *Jan lubi Marię* [John likes Mary], more than one argument. One should think, though, that this would go against the actual intention of Ajdukiewicz's work. Indeed, the next passage reads: "in natural languages, predicates are always *verba finita*, such as 'lives,' 'sings,' or expressions such as 'is human."' (Ajdukiewicz1960: 353). Structures made up of an auxiliary verb and a noun or adjective would thus be main operators in simple sentences and would constitute an element of the category $\frac{w}{i}$. In other words, traditional general names would either be dependent passages of such expressions as 'is human' or independent expressions bound by the operator 'is' which, with this kind of interpretation would not be a sentence generating functor from two name arguments, but a functor generating functor from a functor argument. It is difficult to apply the same procedure for expressions made up of an auxiliary verb and a noun that can be included in a syntactic structure with another noun. Take the sentence *Paweł jest bratem Jana* [Paul is John's brother]. We can assign two different structures to it:



In the first case, the main operator of the sentence would be the expression *jest bratem* [is ... brother], which would need to be interpreted as a sentence generating functor from two individual names, thus being a predicate in a logical sense. In the other, the expression 'is John's brother' would be a compound functor of the type $\frac{w}{i}$. Between the word *Paweł* and the expression 'is John's brother' there would obtain a subject-predicate relationship, then. This expression would be divided into the functor *jest* [is] — an element of the class $\frac{w}{\frac{i}{i}}$, — the functor *bratem* [brother] — of the class $\frac{i}{i}$ — and an individual name *Jana* [John's].

Which of these interpretations should be selected? Ajdukiewicz claims that "if we interpret the notion of word *in specie* broadly, we can consider general names such as *człowiek* [human] to be the same words as *verba finita człowieczy się* [humans oneself] (if one takes the liberty to use a new coinage instead of j*est człowiekiem* [is human])" (Ajdukiewicz1960: 353). The word *człowiek* [man/human] and the expression *jest człowiekiem* [is human/is a man] would thus be two specimens of the same expressions, and the difference between them would be — like inflection suffixes — an exponent of their different syntactic position: the position in sentences, the position of an operator and the position of an argument.[1] Can we similarly

[1]The notion of "word *in specie*" would necessitate a broader treatment here. Ajdukiewicz apparently identifies it with what linguists call a 'lexeme,' that is a set of words or expressions of the same core and the same lexical signification (*kobieta, kobiecie, kobieto,* etc. [a woman, to a woman, hey, woman!]). Such a position would assume, however, that the same word *in specie* is, say, the pair *Jan-Janowie* [John — {pl.} Johns], where its first element is an individual man, and the other is not.

treat pairs such as 'brother — is a brother?' If the copular verb *jest* [is] is not, in Ajdukiewicz's opinion, an independent expression but only a fragment of a sentence generating functor, the other of the interpretations of the sentence *Paweł jest bratem Jana* would be ruled out. The expression *jest bratem* [is a brother] would thus belong to the class $\frac{w}{i,i}$. However, some more general doubts come up. The intention of Ajdukiewicz's paper was, apparently, not only the elimination of general names, but also an attempt to make a distinction between syntactic positions and semantic categories of colloquial language. The following footnote would testify to this:

I have used the term *operator* instead of *functor*, quite commonly used in Polish nomenclature, because the latter carries some ambiguity. *Functor* means something else in the context "expression *f* is a functor (just that)," and something else in the context "expression *f* is a functor (or performs as one) in expression W." In the contexts of the first kind, the term *functor* is the name of some (absolute) property of some expressions, but in the contexts of the other kind, it is the name of the relation of this expression to another one [...]. To avoid this ambiguity, I introduce the term *operator* where I mean the relation of this expression to another one, namely, regarding the syntactic role one expression performs in another expression. I leave the term *functor* as the name of some absolute property of some expressions. The notion of an *operator* is clearly a syntactic notion while the notion of a *functor*, at least in the sense this paper assigns to it, a semantic notion (Ajdukiewicz1960: 346).

The same expression can occupy various syntactic positions in a sentence. So, the word *brat* [brother] (=*jest bratem* [is ... brother], if we agree with Ajdukiewicz's proposition of their being identical) can be:

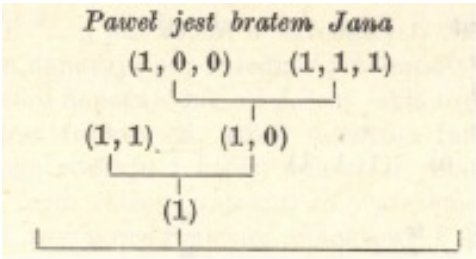
1. the main operator of the first argument of the main operator of the sentence, such as *brat Jana lubi wesołą Marię* [John's brother likes the cheerful Mary];

2. the first, second or third argument of the main operator of the sentence such as *Brat śpi pod drzewem* [brother is sleeping under a tree], *Paweł rozmawia z bratem* [Paul is talking to {his} brother], *On dał to bratu* [He has given it to {his} brother];

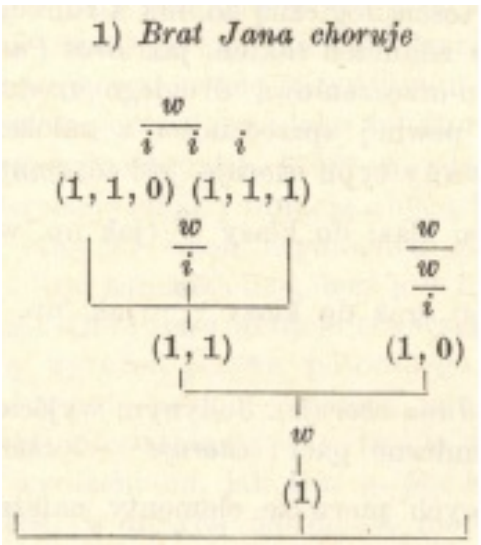
3. the main operator of the sentence such as *Paweł jest bratem Jana* [Paul is John's brother].

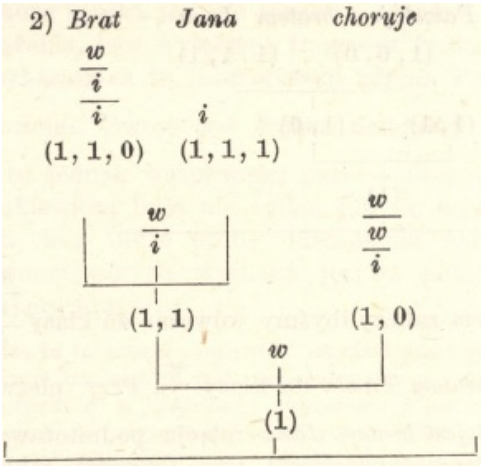
Any expression — as would follow from Ajdukiewicz's remarks — is an element of exactly one semantic class. Can we really consistently treat

the pair *brat — jest bratem* [brother — is a brother] as two specimens of the same expression? Which semantic class one would need to count it part of? The previous analysis of *Paweł jest bratem Jana* (upon the elimination of the independent copular verb *jest*, as intended by Ajdukiewicz) would indicate that it is to the class $\frac{w}{i,i}$. There is another possibility. We can parse these sentences as follows:



The expresion *brat — jest bratem* [brother, is a brother] would then be counted as $\frac{w}{\frac{i}{i}}$, and the expression *brat Pawła — jest bratem Pawła* [Paul's brother, is Paul's brother] — into $\frac{w}{i}$. With the first interpretation in the sentence *Paweł jest bratem Jana* the subject-predicate relationship does not obtain; with the other, it does. The first one assumes that the expression *jest bratem* [is a brother] denotes a relationship between two individuals and the logical value of the sentence; the other — that the expression *jest bratem Jana* [is John's brother] denotes the relationship between some individual and the logical value of the sentence. Let us now see how, in light of the settlements so far, analyze the sentence *Brat Jana choruje* [John's brother is ailing]:





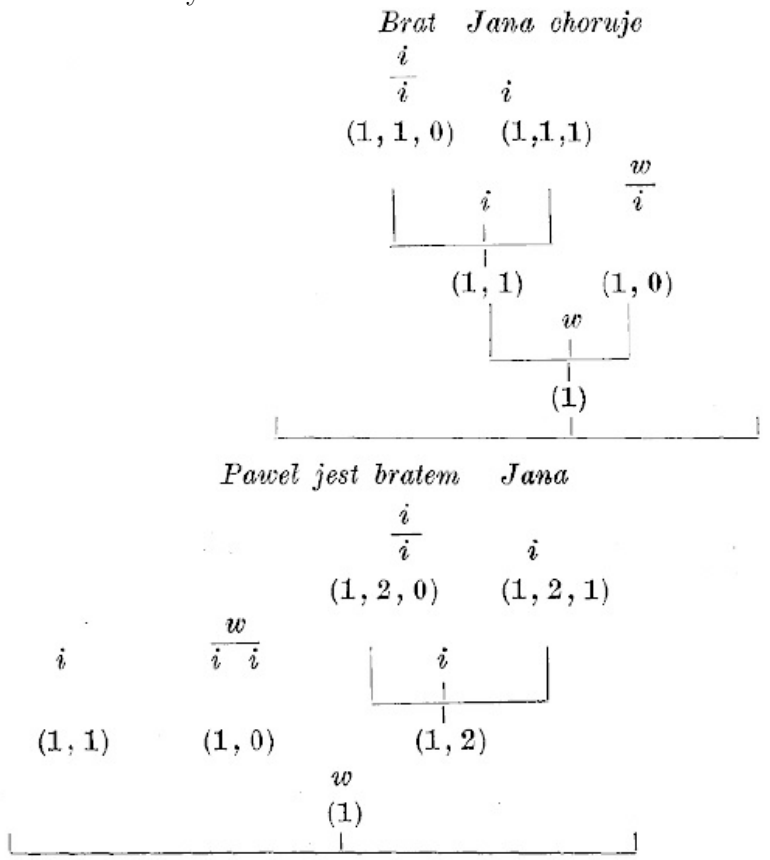
In both cases, the expression *brat Jana* [John's brother] would denote the function of being John's brother, while the verb *choruje* [is ailing] — the relationship between the function and the logical value of the whole sentence. Ajdukiewicz suggested a solution in cases when the functor appears in the position of argument. He says that then we have to deal with a subject-predicate relationship of the second order. So, in the sentence *Człowiek jest rozumny* [Man is rational] the argument *człowiek* [man], belonging to the class $\frac{w}{i}$, remains in the relationship of the second order subject to the second order predicate relative to the expression jest *rozumny* [is rational], which is then an element of the category: $\frac{w}{\frac{w}{i}}$
This expression thus denotes a relationship between the logical value of the sentence and the function of 'being a (hu)man' [*bycie człowiekiem*]. So, even in such sentences as *Brat Pawła choruje* [Paul's brother is ailing] there would be a subject-predicate relationship of the second order. Such a concept remains at odds with the assumption of semantic classes being disjoined: expressions such as *choruje* [is ailing] or *jest rozumny* [is rational] can belong to two classes — class $\frac{w}{i}$ (such as in the sentences *Jan jest rozumny; Jan choruje*) and class $\frac{w}{\frac{w}{i}}$ (*Człowiek jest rozumny*, *Brat Jana choruje*). The only way out here would be an assumption that there are homonymous pairs: *choruje*^{1} — *choruje*^{2}; *jest rozumny*^{1} — *jest rozumny*^{2} where the first elements belong to class $\frac{w}{i}$ and the others to class $\frac{w}{\frac{w}{i}}$. This would, however, undermine the notion '*in specie*' so important for Ajdukiewicz's conception.

Treating such expressions as *brat Pawła* [Paul's brother] as second order subjects in some sentences can hardly be reconciled with a commonplace feeling by language users, who, using those, speak of some individuals rather than functions. Ajdukiewicz writes about it in these initial passages: "an

essential feature of the respective language systems [...] is that in some specific conditions, of two expressions A and B, denoting the objects α and β respectively, there arises a compound expression of some other object γ rather than α or β. If A is a functor, denoting function α, specified for objects of some kind, and does not refer to expression B, denoting object β of this very kind, then the expression made up of A and B denotes an object assigned to object β by function α. Thus the expression "Socrates' father" is a name of Sophroniskos" (Ajdukiewicz1960: 351). If, however, expressions such as *ojciec Sokratesa* or *brat Jana* denote individuals, then (given the dependent character of the copular verb *jest* [is]) assuming they are the same expressions as *jest ojcem Sokratesa*[Socrates' father] or *jest bratem Jana*[John's brother], they would denote individuals also in such expressions as "Sophronishos is Socrates' father" or *Paweł jest bratem Jana* [Paul is John's brother]. These expressions would then fail to be sentences as they would comprise of two individual names, which is obviously absurd. There are three equivalent solutions possible here.

First, we can say that the expression *brat* — a brother is a sentence generating functor from two individual names, which in sentences of the type *Paweł jest bratem Jana* [Paul is John's brother] denotes the relationship between two individuals and the logical value of the whole. But when it performs as the main operator of an argument, by itself does denote something; it is part of a compound expression that denotes some individual. Second, the expression *brat — jest bratem* can be treated as a functor that generates a sentence generating functor from an individual name, which in sentences such as *Paweł jest bratem Jana* denotes a relationship between the function of being a brother and an individual. When it forms part of an argument of the main operator of a sentence, it doesn't denote on its own but is part of an expression that denotes an individual. Both these interpretations create serious problems with the taxonomy of colloquial language expressions. If the criterion of some word belonging to some semantic category were to be its absolute semantic qualities, then we do not know what to do with expressions such as *brat — jest bratem*. In some contexts they denote something, in others they do not constitute independent expressions but parts of compounds denoting expressions. Which of their properties would decide their taxonomy and is the word brother in 'John's brother is ailing' the same expression as 'is a brother' in the sentence *Paweł jest bratem Jana* [Paul is John's brother]? A third interpretation is possible too: recognizing the word *in specie brat* [brother] as a sentence generating functor from an individual name. The sentences *Brat Jana choruje* and *Paweł jest bratem*

would then be analyzed as follows:



An independent denotative role would thus need to be granted to the copular verb *jest* [is], though, equating the pair *brat-jest bratem* would need to be abandoned and the category of general names would need to be introduced to the description of colloquial language. This procedure would be at odds with Ajdukiewicz's intentions as presented in the paper, but it would guarantee the disjunction of name categories. It is not hard to notice, though, that functor categories would become inseparable as a result. With this interpretation of language, the copular verb *jest* [is] would constitute: a sentence generating functor from two individual names (such as P*aweł jest bratem Jana*), a sentence generating functor from an individual name and a general name (*Paweł jest spokojny* [Paul is calm]), and finally a sentence generating functor from two general names (*Człowiek jest rozumny* [man is rational]). Most verbs would be fraught with the same ambiguity.

It is impossible to determine on the basis of Ajdukiewicz's conception, which of the three interpretations would need to be chosen. All of these seem equally legitimate and equally fraught with theoretical errors. In the end,

we are unable to decide whether it is possible to consistently eliminate the category of general names from the description of colloquial language as a result of equating such pairs of expressions as '(hu)man — is a (hu)man,' 'brother — is a brother,' etc. and treating those as sentence generating functors from individual names without abandoning the assumption of semantic classes being disjoined. Note that most expressions which Ajdukiewicz would tend to count as functors can, in colloquial language, function as alongside arguments or without them, which brings up another portion of difficulty. Thus, we would be inclined to attribute to the sentence *Jan czyta* [John is reading] the following structure: i — (1, 1) $\frac{w}{i}$ — (1, 0) and treat them as a pure example of a subject-predicate relationship. On the other hand, in the sentence *Jan czyta Marii* [John is reading to Mary], the functor *czyta* [is reading] binds two arguments. How should then the verb *czyta* [is reading] be classified if we mean to be consistent in defending the position that the semantic classes of colloquial language are disjunct and that the criterion of an expression belonging to this or that class were to be its absolute semantic properties, independent from sentential context?

So far we have not dealt in more detail with individual names. The criterion of an expression belonging to this class is, in Ajdukiewicz's conception, the denotation of an individual. But this procedure, in contact with colloquial language, proves of little use to its analysis. We can use the same word or expression so it refers to an individual or in such a way as to refer to a group of individuals, and this is a key skill for fluent use of language. The word *brother* can be a true indication of a number of people, and so it is not an individual name according to traditional systems of logic. But a context can be shown without any difficulty where the statement most certainly refers to exactly one person, such as *Brat pojechał wczoraj do Krakowa* [Brother went to Cracow yesterday]. Someone who is making this kind of statement is using the word *brat* in such a way that it refers to only one individual. So is the case with the expression *jakiś chłopiec* [a/some boy]. Separated from sentential contexts, it denotes more than one individual and so it does not differ from the expression *jacyś chłopcy* [some boys]. But of the pair of the pair of sentences *Jakiś chłopiec kradnie jabłka w twoim ogrodzie* [a boy is stealing apples in your garden] and J*acyś chłopcy kradną jabłka w twoim ogrodzie* [some boys are stealing apples in your garden] each implies something else. The former that the thief is one; the latter that there are at least two. Using the former expression we can indicate exactly one individual, but we cannot do that with the other sentence. This fact is possibly all the more significant for the description of colloquial language

than the fact that both these expressions, taken out of context, can refer to more than one person.

The observation that most expressions from colloquial language change their semantic roles together with the change of the sentential context might give rise to two varying conclusions. First, one may maintain that semantic classes are inseparable in colloquial language. Also, most words and expressions can be elements of more than one category. No expression can be an individual name in general, but it can only be one in a specific sentential context. Depending on how we use it, the word 'brother' can be an individual name or a general name. This interpretation of colloquial language would demand that extralinguistic contexts be included into semiotics as well. So, empty names most certainly include such expressions as *kwadratowe koło* [square wheel] or t*en, który się nigdy nie narodzi* [the one who will never be born]; however, in order to determine whether the expression *mój najstarszy brat* [my eldest brother], in the sentence *Mój najstarszy brat ma dwoje dzieci* [my elder brother has two children] is an empty or individual name, one needs to know whether someone who uttered the sentence does have male siblings or not. Including extralinguistic contexts into semiotics can face a charge that such a position makes the analysis of colloquial language rather sterile in scholarly terms. We ought to investigate and describe only that which we know about the functions of expressions upon the mere knowledge of language. Otherwise — all the more so that we cannot predict all extralinguistic contexts where any given expression can be used — the description of language would consist in prolonged collections of examples and facts, which would never lead to any generalizations, indispensable in any science.

Second, as was done by Ajdukiewicz, one can claim that semantic classes of colloquial language are disjointed. But since expressions change their semantic roles depending on the sentential contexts where they occur, one either would need to assume that most utterances in colloquial language are incomplete and make up abbreviated forms of compound statements or claim that most colloquial language expressions are homonymous, that is, expressions sharing the same spelling and pronunciation but different meanings. Both versions of this interpretation of language are fraught with some difficulty. So, the sentence *Brat pojechał wczoraj do Krakowa* [... brother went to Cracow yesterday] can be treated in two ways. One can allege that it is an incomplete utterance, being a shortcut of one of the following sentences:

1. My eldest [*najstarszy*] brother went to Krakow yesterday;

2. My youngest [*najmłodszy*] brother went to Krakow yesterday;
3. My only [*jedyny*] brother went to Krakow yesterday;
4. One of [*jeden spośród*] my brothers went to Krakow yesterday;
5. Someone's [*czyjś*] brother went to Krakow yesterday, etc.

One can maintain that it is an ambiguous sentence because it includes the word *brat* [brother], which in reality corresponds to a set of homonyms: $brother^1$, $brother^2$, $brother^n$.

Obviously, without any in-depth knowledge of the situation where this utterance was made, we do not know which of the versions was in fact used or which of the meanings of the word 'brother' the speaker had in mind. Determining this, however, is not the researcher's job; they stop at making a note of ambiguity or incompleteness.

The theory of the "incompleteness" of an utterance, makes the description of language practically impossible. Even simple grammatical sentences prove complex statements, requiring meticulous supplementation which hardly lend themselves to elementary syntactic analyses. Also, it treats as a flaw what is in fact an advantage of colloquial language — the fact that almost any expression can be used in a variety of ways. The most serious difficulty would be associated with the notion of 'incompleteness,' though. Clear criteria would be needed to determine when an utterance is incomplete. Most verbs, as we have seen, can come with a number of nominal arguments as well as a number of adverbials of place, time, etc. Also, it is not quite clear whether the status of such adverbials is exactly the same as the status of nominal arguments, or whether they are optional elements. So, because the verb 'reads' [*czyta*] can occur in the following context: *Jan wolno czytał Marii w ogrodzie ostatnią powieść Konwickiego* [John was slowly reading to Mary the latest novel by Konwicki], the sentence *Jan czyta* [John is reading] ought to be treated as an abbreviated form of the utterance *Jan jakoś czyta coś komuś* [John is reading something to someone somehow]? On top of the obvious difficulties in establishing the criteria of incompleteness, another doubt emerges here. Even if we assume that the sentences "...brother went to Krakow yesterday" or "John is reading" are incomplete, it is certainly not the same kind of "incompleteness" as in *jest nauczycielem* [{he/she, implied; L.K.} is a teacher] or *stuka* [{he/she, implied; L.K.} taps]. A distinction should therefore be made between the two kinds of "incompleteness."

Similar charges can be levelled against the theory of "ambiguity." Making the simplest possible lexicon of some ethnic language would be a

Sisyphus' task with this kind of interpretation and the fact that despite repeated ambiguity of words, we do communicate, would border on the impossible. The theory of meaning would cause most problems, though. The sentence "brother went to Cracow yesterday" is certainly "ambiguous" in a different sense than *Brat ojca namalował* [brother has painted the father; father's brother has painted]. One could go to great lengths explaining that the ambiguity of the sentence *Brat ojca namalował* is of a syntactic nature because it is not clear whether the word *ojca* is an argument of the word brat or the second functor of the verb *namalował*. But the sentence *Brat odmawiał brewiarz* [... brother was praying from the breviary] is also ambiguous but this is not a syntactic ambiguity. That the word brother can either mean the same as "a male sibling" or a "monk," which is definitely another kind of ambiguity than the fact that the word brother can mean "the eldest...," "one of ...." etc. Using the word 'ambiguous' in both of these senses would need serious modifications in the understanding of the word 'meaning.'

As can be seen from the above discussion, a solution to the issue of the logical subject of a sentence is yet to come, and that might not be soon. What would be needed is a preselection of one of the many interpretations of colloquial language, and at least a provisional elimination of problems that each of these entails; deciding whether the category of general names should be abandoned for the sake of functors or, along with tradition, it should be kept; finally, criteria should be specified — precise and adequate consideration of the way in which expressions function in colloquial language — of "being an individual name," "being a functor" etc. One can quite sensibly ask, though, whether the notion of logical subject is as useful as it is problematic. Irrespective of the possible differences in positions, the subject-predicate relationship is characteristic of the simplest sentences of colloquial language. In the remaining cases it proves a useless concept. One can also doubt whether this relationship indeed deserves some special treatment. Along with the concept by Ajdukiewicz, which has been discussed here, in the sentence *Paweł śpi* [Paul is sleeping] there obtains a subject-predicate relationship, whereas the sentence *Paweł lubi Marysię* [Paul likes Mary] does not have it. Other than the issue that there are far more functors in language that have two or more arguments than there are those with one argument, one can provide no good reason to treat as the subject an individual name only when it is the one and only argument. Both the word *Paweł* in the first sentence and the words *Paweł* and *Marię* in the other serve the purpose of indicating some individuals. Why not accept that a sentence can have more than one logical subject, then, that is, the fact that "being a subject" in a

sentence is tantamount to "being an argument referring to an individual?"

Bibliography

1. Ajdukiewicz, Kazimierz (1960) *Język i poznanie. vol. I: Wybór pism z lat 1920-1939.* Warszawa: PWN.

2. Ajdukiewicz, Kazimierz (1965) *Język i poznanie*, vol. II: Wybór pism z lat 1945-1963. Warszawa: PWN.

Jacek Juliusz Jadacki

ON RUSSELLIAN THEORY OF DESCRIPTION

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I

A thorough account of the structure of linguistic expressions is possible — according to Bertrand Russell — only when (1) they concern the usual REAL world, and concern it in a SENSIBLE way.

This usual world consists of only definite (individual, isolated) objects (Russell 1956a: 173). Only those objects EXIST. ONLY THINGS EXIST. Russell rejects any other understanding of "existing."

And talking about something in a sensible way is asserting this something to be true or false, or — following the Aristotelian understanding — asserting, respectively, in accord or discord with the reality.

Thus, talking about the WORLD IN A SENSIBLE WAY is asserting truth (in accord with the reality) or falsity (in discord with the reality) about definite (existing) objects. Hence, e.g. the sentence *I met Jones* has sense because it is true that I met Jones. Also, the negation of this sentence, i.e. the sentence *I did not meet Jones* has sense because (in this case) it is false.

And about the sense of the sentence *I did not meet a unicorn*? We feel that the sentence is true, hence it should have sense. The sentence *I did not meet Jones* asserts something about Jones. Thus, one could say that the analogous sentence *I did not meet a unicorn* asserts something about a unicorn. Could it be, then, that the sentence *I did not meet a unicorn* has no sense?

To be in agreement with LINGUISTIC FEELING (usage) (Russell 1956a: 167), which does not allow us to doubt that the given sentence has

sense, and REALITY FEELING (feeling for reality) (Russell 1956a: 169, 170), which rejects a way of existing other than "real" — Russell assumes that the sentence is an ABBREVIATION, which can be DEVELOPED into the negation of the existential sentence: *There is an entity, which is a unicorn and which I met*. Here, it is clearly visible that the examined sentence does not assert anything about a unicorn, but says something (indirectly) about the notion of *unicorn*. The word *unicorn* does not name anything (does not refer to anything), but describes — namely: a certain non-existing object; an object that is a unicorn. This means that the word *unicorn* is not a name but a description; the description assigning an object the property of "being a unicorn." This is the case of every expression whenever it is it is doubtful if there is an object to which this expression refers.

For a NAME[1] (proper name, in a strict sense; or else: logically proper name) (Russell 1956a: 178) — i.e. an independent, directly meaningful (referring) symbol — has SENSE when THERE IS AN OBJECT that is (directly) NAMED by this name, and that is the name's meaning; if a name names nothing — it has no sense. A DESCRIPTION[2], however — i.e. a dependant symbol without an independent meaning (i.e. that does not refer, but describes), indirectly meaningful (Russell 1956a: 170) — has SENSE, when it DESCRIBES either SOMETHING EXISTING or NON-EXISTING.

In the English language, because of the indefinite article *a* (or *an*) and definite article *the*, it is necessary to differentiate between an indefinite

[1]According to Russell, a name is, in principle, a simple symbol, for it is not possible to indicate its component parts that are also symbols. A name as such is assigned to a certain object, its meaning is not determined (the same applies to descriptions).

[2]Contrary to a name, a description is usually a complex symbol, for it has component parts that are symbols themselves. Thus, if those component parts have a certain meaning, then they determine the "meaning" of the whole description (Russell 1956a: 174, 179). Czesław Lejewski wittily observes that this holds true in reference to names: indeed, if the meaning of individual component parts, i.e. words, is fixed, then in a name — with only one such word — the meaning of the whole name is fixed (namely of this one single word) (Lejewski 1960: 27). It is worth noticing that the issue of simple and complex symbols is not sufficiently clear in Russell. He juxtaposes two expressions: *Scott* and *the author of WAVERLEY* (Russell 1956a: 173—174). The parts of the expression *Scott* — namely, the five letters of the Latin alphabet — are not symbols, hence the expression *Scott* is a simple symbol. The nineteen letters of the expression *the author of WAVERLEY* — are also not symbols. Yet, it is possible to divide the expressions into parts that ARE symbols: these are the words that form the expression. There are four such words: *the*, *author*, *of* and *WAVERLEY* (cf. Lejewski 1960: 27). Their meanings are fixed. These words are certainly not complex symbols. However, are they simple symbols? And what kind of a symbol is the name *Sir Walter* or *Walter Scott*?

description of the form *a so-and-so* and a definite description of the form *the so-and-so*.[3] They differ in that an indefinite description may describe MORE THAN one object, while a definite description may describe AT MOST one object.[4]

Let us assume the following:

$\eta x(Fx)$ stands for the expression "an x that has property F" (an indefinite description)

$\iota x(Fx)$ — "the x that has property F" (the definite description)

G — a predicate.

Then the sentence with an indefinite description

$$G[\eta x(Fx)]$$

is, according to Russell, an abbreviation of an existential sentence

$$\bigvee x(Fx \ \wedge \ Gx)$$

And the sentence with a definite description

$$G[\iota x(Fx)]$$

— an abbreviation of an existential sentence

[3]Initially, Russell used the expression „denoting phrase" instead of „description" or „descriptive phrase". He differentiated denoting phrases that denote: (1) one particular object (*the so-and-so* in the singular); (2) unclearly, i.e. one object of a particular group (*a so-and-so*, *so*, *some so-and-so*); (3) all particular objects (*all so-and-so*, *any so-and-so*), and also such denoting phrases that do not denote anything (Russell 1956b: 41). The clumsiness of the expression "a denoting phrase that does not denote anything" was probably one of the reasons why he replaced "denoting phrase" with "descriptive phrase."

[4]It is not possible to keep the distinction between definite and indefinite descriptions in languages that do not have articles. Hence, Polish authors do not approach the issue of descriptions AS Russell does; what they discuss is a descriptive FUNCTION (Pelc 1971: 45, 49).

$$\bigvee x\{Fx \ \wedge Gx \ \wedge \ \bigwedge y\,[(Fy \ \wedge \ Gy) \ \rightarrow \ (y = x)]\}$$

II

What are, in Russell's opinion, the advantages of approaching the examined expressions in such a way? The answer has, partially, been given. First — we stay in accord with the reality feeling as we do not accept that there exist objects other than real ones. Second — we preserve language usage according to which a sentence's sense (truth or falsity) is assigned. Above all, however, the approach allows the solving of some troublesome linguistic paradoxes (Russell calls them "puzzles") (Russell 1956b: 47, 51).

1. By the identity principle, the sentence *Scott is the author of WAVERLEY* can be reduced to *Scott is Scott*. Yet the otherness (e.g. in the cognitive value) of the two sentences is evident, especially when the phrase *the author of WAVERLEY* is secondary (see below). Noting the difference between a name and a description allows for the avoiding of a cognitively empty identity of the type $a = a$, prevents from (an incorrect) substitution of a description in the place of a name and preserving the identity of the type $a = b$.[5] Because, in the sentence *Scott is the author of WAVERLEY*, if we substitute

the expression *Scott* with s, and
the predicate *is the author of WAVERLEY* with A,

[5]According to Lejewski (1960: 27, 28), the difference between a sentence of the type *Scott is Scott* and *Scott is the author of WAVERLEY* has nothing to do with the difference between a description and a name. It is so that either all substitutions of $\bigwedge x(x = x)$ are true, and hence the sentence *The author of WAVERLEY is the author of WAVERLEY* is true, or $\bigwedge x(x = x)$ is not a law. Well, $\bigwedge x(x = x)$IS A LAW — but with a certain restriction, however, not the one proposed by Russell, i.e. that if x is substituted with a description, then there must exist an object specified by the description. The restriction should not concern the x but the relation $=$, whose understanding could be strong if $\bigwedge a, b\,\{(a = b) \ \equiv \ [(a = b) \ \vee \ (b = a)]\}$, or weak if $\bigwedge a, b\,\{(a = b) \ \equiv \ \bigwedge c\,[(c = a) \equiv \ (c = b)]\}$. This is how Lejewski (using research results of Polish logicians) reconstructs Russell's whole theory. He points to the fact that when the sentence *Scott is the author of WAVERLEY* is considered a substitution of the function Φx where Φ is the predicate *is-the-author-of- WAVERLEY* (and *being-the-author-of-WAVERLEY* is considered a certain property) (Russell 1956a: 171), then "is" is relieved from the responsibility IT is burdened with (which is more evident in languages without articles, e.g. in Polish): the responsibility which Russell (not necessarily correctly) assigns to descriptions (Lejewski 1960: 19, 20).

then

$$As \ \wedge \ \bigwedge x(Ax \ \rightarrow x = s)$$

2. By the law of excluded middle, either the sentence *I met a unicorn* or the sentence *I did not meet a unicorn* is true. However, a unicorn belongs neither to the real objects I met, nor the ones I did not meet. In order to save the sentences' sense it is possible to assume that *unicorn* is not a name, but a description.

Let us assume the following:

$\eta x(Jx)$ stands for a description *unicorn*,
K — the expression *I met*.

Then the sentence *I met a unicorn* is

$$\bigvee x\,(Jx \ \wedge \ Kx)\,,$$

which is a false sentence.

The sentence *I did not meet a unicorn* can be presented in the form

$$\bigvee x(Jx \ \wedge \ \sim Kx)$$

or

$$\sim \bigvee x\,(Jx \ \wedge \ Kx)\,.$$

In the first interpretation, the description $\eta x(Jx)$ is taken primarily (as a primary phrase), in the other — SECONDARILY (as a secondary phrase) (Russell 1956b: 52). In the first case, the sentence is false (as any sentence in which a description used primarily describes a non-existent object), in the other — it is true. In this way, both sentences have sense.

This is how we can talk about non-existent objects: those which do not exist and have never existed (not real), and those which could not even exist (contradictory). For, an (affirmative) non-existential sentence (or the one that cannot be "translated" to an existential sentence) has sense when it asserts something (true or false, but not existential) about an existent object (we fully understand the sentence when we know the object), while it

has no sense when it asserts something about non-existent objects. Unlike such sentences, an (affirmative) existential sentence has sense when it asserts something (true or false, and existential) about the object described by a description (we understand the sentence even when we do not know the described object), while it has no sense (it is grammatically incorrect) when it asserts existence of an object named (by a name).

III

Russell's approach has attracted multidimensional criticism. It turned out that the approach cannot be applied generally (especially on the grounds of colloquial language) as it is sometimes contrary to linguistic facts.

1. Russell's criteria specifying descriptions and logically proper names are not reliable (Strawson 1963: 167; Toulin, Baier 1963: 210). Such an absolute differentiation is not language-based (Pelc 1971: 49, 58, 114).

Some expressions, which according to Russell's criteria should be regarded as descriptions, function as names. For example, *the man over there* in the sentence *The man over there is clever* (Prior 1971: 152).

Also, even Russell himself admits that words such as *Homer* (Russell 1956a: 172) or *Scott* (Russell 1956a: 174-175) — thus simple symbols — can be USED as (abbreviated) descriptions that specify certain objects with these names; hence, eventually, it is not the syntactic difference, nor the form (shape), but a single usage that decides "what" a given expression is.[6]

2. Russell's interpretation patterns of (affirmative) sentences with descriptions (the interpretations were aimed at revealing the proper, i.e. predicative, nature of these descriptions) applied to some sentences producing paradoxical consequences.

Let us consider the following sentences analyzed by Russell (Linsky 1963: 80-83): *George IV wished to know if Scott was the author of WAVERLEY*. The sentence contains the description *the author of WAVERLEY*, which could be interpreted in two ways, depending whether we assume that the description *the author of WAVERLEY* is primary or secondary.

Let us assume the following:

F — is the author of WAVERLEY,

[6]Thus, eventually, Russell claimed that names in a strict sense, i.e. such that are names not only due to their shape, that CANNOT be used otherwise than as names, that CANNOT be substituted by descriptions (Russell 1948: 78), are only indexical determiners *this* and *that*, whose denotation is relativized to the speaker (Russell 1956a: 178; Russell 1951a: 108).

G — *is Scott*,
H — *George IV wished to know if*.

In the first interpretation, the sentence will have the form:

$$\bigvee x[\bigwedge y\,(Fy \equiv y = x) \wedge H\,(Gx)]$$

while in the other:

$$H\,\{\bigvee x\,[\bigwedge y\,(Fy \equiv y = x) \wedge Gx]\}\,.$$

a. The analyzed sentence (in its original wording version) does not entail that one and only one person is the author of *Waverley*. However, Russell's interpretation LOGICALLY ENTAILS such a conclusion. For, in accord with the law $\bigvee x\,(Px \wedge Qx) \rightarrow \bigvee xPx \wedge \bigvee xQx$ and the law $(p \wedge q) \rightarrow p$:

$$\bigvee x\,[\bigwedge y\,(Fy \equiv y = x) \wedge H\,(Gx)] \rightarrow$$

$$\rightarrow \bigvee x\,[\bigwedge y\,(Fy \equiv y = x) \wedge \bigvee x[H(Gx)] \rightarrow$$

$$\rightarrow \bigvee x\,[\bigwedge y\,(Fy \equiv y = x)]\,.$$

In this way, it is easily provable that Bolesław Krzywousty had only one son. For example, when we prove that the sentence *I want to make sure if Bolesław Kędzierzawy (Boleslaw IV the Curly) is the son of Bolesław Krzywousty (Boleslaw III Wrymouth*) is true.

b. The second interpretation of the sentence *George IV wished to know if Scott was the author of WAVERLEY*, i.e.:

$$H\,\{\bigvee x\,[\bigwedge y\,(Fy \equiv y = x) \wedge Gx]\}\,,$$

LOGICALLY ENTAILS:

$$H\,\{\bigvee x\,[\bigwedge y\,(Fy \equiv y = x) \wedge \bigvee xGx]\}\,,$$

which entails (!):

$$H\,\{\bigvee x\,[\bigwedge y\,(Fy\ \equiv y = x)]\}\,,$$

thus

$$H\,\{\bigvee x\,[Fx\ \wedge\ \bigwedge y\,(Fy\ \rightarrow\ y = x)]\}\,,$$

and further

$$H\,\{\bigvee x(Fx)\ \wedge\ \bigvee x[\bigwedge y\,(Fy\ \rightarrow\ y = x)]\}\,,$$

and finally, by De Morgan's law:

$$H\,\{\sim\langle\sim\ \bigvee x\,(Fx) \vee\ \ \sim\ \bigvee x\,[\bigwedge y\,(Fy\ \rightarrow\ y = x)]\rangle\}\,.$$

Thus, eventually, George IV wished to know if it was false that either there was somebody who wrote *Waverley* (i.e. if *Waverley* was written at all), or there was no such person to whom everybody who wrote *Waverley* were identical (i.e. if *Waverley* was written by more than one person). And — it could be argued — George IV possibly knew that *Waverley* had only one author, he just did not know who it was.

Such paradoxical consequences are inevitable after de-intensionalisation of the function *George IV wished to know if* (which is attributed to Russell) (Lejewski 1960: 27). Then, even introducing an intuitively unjustified distinction between a primary and a secondary usage (Lejewski 1960: 22) does not help.

It has been pointed out that three misconceptions in Russell's theory are responsible for these and similar troubles (Strawson 1963: 163):

1. that (affirmative) sentences REFER to real objects;

2. that (affirmative) sentences HAVE sense when they are either true or false, i.e. when they assert (real) objects in accord or discord with the reality;

3. that (affirmative) sentences with descriptions, by IMPLICATION, ENTAIL existential sentences that concern the existence (or non-existence) of the objects specified by these descriptions.

The Russellian approach towards the issue of reference and sense in (affirmative) sentences in general and towards the matter of translation of (affirmative) sentences with descriptions is confronted with the following claims:

1. Sentences themselves do not (actually) REFER to anything. (Affirmative) sentences CAN BE USED (potentially) so as to refer to real objects (Linsky 1963: 74; Strawson 1963: 171-172).
2. (Affirmative) sentences have sense when they CAN BE USED so as to assert truth or falsity about something (Strawson 1963: 173).
3. The existential sentences discussed by Russell cannot be regarded translations of (affirmative) sentences with descriptions (as they do not entail these sentences by implication), nor are they asserted. Their validity, however, is a NECESSARY CONDITION FOR A CORRECT USAGE (and in this sense, they are "implied", but by a sentence usage) of these (affirmative) sentences (with descriptions) (Geach 1954: 34; Strawson 1963: 175). Thus, contrary to Russell's line of argument, the sentence *The present king of France is bald* does not entail, by implication, that the king of France exists. However, the existence of the king of France needs to be assumed if the sentence is to be considered correct (Geach 1954: 34). Otherwise, the sentence is incorrect, or (which is the most frequent case) the sentence's context does not involve the truth-falsity dilemma (Linsky 1963: 85-86).

IV

In general, what Russell is criticized for is that he attributes to expressions what, in fact, is the property of their USAGE (Strawson 1963: 179-180). Thus, it is assumed that Russell considers his theory of description as accurate on the grounds of natural language, or even as an analysis of natural language.

However, it is not as clear as most of Russell's critics would like to see. It seems that the matter is similar to the case of John Stuart Mill, who was very often criticized but not necessarily for his own views (Ryle 1963: 139), as well as to the case of Russell's criticism of Gottlob Frege and Alexius Meinong based on a superficial assessment of their views that disregarded their aims (Clack 1969: 46-47).

1. Russell refers in his comments to propositions (Russell uses that term nearly exclusively), therefore by the same token he reduces his analysis to sentences in a single usage (it is worth noting that he ignores expressions of the type *the first morning of spring*) (Russell 1956a: 170). Hence, he claims that these VERBAL EXPRESSIONS (Russell 1956b: 43, 45, 55)

OF PROPOSITIONS that contain CORRECTLY USED descriptions (so that the speaker is not self-contradictory) (Russell 1956b: 44) and NOT (affirmative) SENTENCES IN GENERAL are abbreviations of corresponding existential sentences, i.e. — to be more precise — of verbal expressions of propositions that do not contain descriptions. What Russell does is not purely descriptive (yet it is neither arbitrary — as some critics would like to believe) (Carnap 1056: 33) but REGULATIVE.[7]

2. The relationship between a translation and the abbreviation that develops into that translation is not unequivocally defined,[8] even by Russell himself. It is possible to differentiate three understandings of this relationship.

Let us mark them by:

p — a sentence with a description,
q — the translation.

The relationship between definiendum and definiens in the Russellian definition of the propositions with descriptions in their verbal expressions (Russell 1956a: 171, 176, 178) can be interpreted schematically in one of the following ways:

1. q results, by implication, from p (Geach 1954: 34),

2. q is implicationally equivalent to p (Clack 1969: 48; Lejewski 1960: 15; Moore 1951: 182; Reichenbach 1948: 261),

3. q is synonymous to p (Black 1951: 242).

The first understanding is related to the expressions such as: "implies" (Russell 1956b: 44) and "involves" (Russell 1956a: 176). The expressions "is implied by (...) and (. . .) implies that" (Russell 1956a: 177) and "is equivalent to" (Russell 1956a: 177), on the other hand, seem to describe implicational

[7]Most probably, this is what Robert J. Clack aims at when he writes that the theory of description is an analysis of their LOGICAL ROLE in colloquial language, an analysis removing a certain ambiguity and vagueness of colloquial linguistic habits (Clack 1969: 52). Clack refers to Kurt Gödel's (Gödel 1951: 130) and Russell's (Russell 1959: 243) opinions. What is peculiar in his work is that he uses the words "sentence," "statement" and "proposition" interchangeably, synonymously (Clack 1969: 47), which must not be done without restrictions.

[8]This ambiguity was perhaps first noticed by George Edward Moore (1951: 181-187). In response to Moore's criticism, Russell (1951b: 691) did not actually refer to this issue.

equivalence, while synonymy is related to the expressions "means the same as" (Russell 1956b: 43) and "is the same as" (Russell 1956a: 176).

Moreover, there is a certain number of expressions that are ambiguous to such an extent that cannot be undoubtedly classified as one of the above relationships. Such expressions are: "we may put, in place of (...), the following" (Russell 1956b: 51), "what we wish to say is equivalent to" (Russell 1956b: 51), "when I assert (...) I really assert" (Russell 1956a: 167), "I advocate" (Russell 1956b: 43). Also, expressions of the type: "becomes" (Russell 1956b: 44, 54), "becomes, when made explicit" (Russell 1956a: 168), "means" (Russell 1956a: 171, 176, 178), "define what is meant by" (Russell 1956a: 177).

As regards the last examples: it does not seem likely that Russell considered q the meaning of p. For, according to Russell, even in the case of a descriptive (denoting) phrase "there is no MEANING, and only sometimes a DENOTATION" (Russell 1956b: 46; 260) (more specifically: a designator). Propositions have no meaning; there are only SYNONYMOUS propositions. For it seems that the (3) UNDERSTANDING OF THE RELATIONSHIP BETWEEN P AND Q IS THE ONE MOST IN ACCORD WITH RUSSELL'S INTENTIONS (provided that synonymy would be a stronger relationship than equivalence). Thus, questioning (1) is of value not as an argument against Russell's (whole) theory, but only as an argument sufficient to reject SUCH INTERPRETATION of the relationship between p and q, which indeed has not been precisely stated by Russell himself.

As regards the quoted examples in which this relationship is "objectified" — they seem to additionally support the claim that Russell (in some formulations) was not as distant from the functional account of meaning as some would like to attribute to him, or, at least, that his theory is not in opposition to this account.

It seems that Russell would not object to the below summary:

If somebody wants to utter a proposition (use a verbal expression) concerning a non-existent object, assert something about this object, then they can use either an (affirmative) sentence with a description, or an (affirmative) existential sentence without a description. In the latter case, they will avoid all the troubles that relate to abbreviatedness of the first approach, since, by means of the existential sentence they CLEARLY state what the sentence with a description states IMPLICITE, and very often ambiguously (for the sentence is an abbreviation).

Bibliography

1. Black, Max (1951) "Russell's Philosophy of Language." In *The Philosophy of Bertrand Russell*, Paul Arthur Schilpp (ed.), 229-255. New York: Tudor.

2. Carnap, Rudolf (1956) *Meaning and Necessity*. Chicago: University of Chicago Press.

3. Clack, Robert J. (1969) *Bertrand Russell's Philosophy of Language*. The Hague: Martinus Nijhoff.

4. Geach, Peter Thomas (1954) "Russell's Theory of Descriptions." In *Philosophy and Analysis*, Margaret Macdonald (ed.), 32-36. Oxford: Blackwell.

5. Gödel, Kurt (1951) "Russell's Mathematical Logic." In *The Philosophy of Bertrand Russell*, Paul Arthur Schilpp (ed.), 125-153. New York: Tudor.

6. Lejewski, Czesław (1960) "A Re-examination of the Russellian Theory of Descriptions." *Philosophy* 35[132]: 14-29.

7. Linsky, Leonard (1963) "Reference and Referents." In *Philosophy and Ordinary Language*, Charles E. Caton (ed.), 74-89. Urbana: University of Illinois Press.

8. Moore, George Edward (1951) "Russell's <<Theory of Descriptions.>>" In *The Philosophy of Bertrand Russell*, Paul Arthur Schilpp (ed.), 175-225. New York: Tudor.

9. Pelc, Jerzy (1971) *O użyciu wyrażeń*. Wrocław: Ossolineum.

10. Prior, Arthur Norman (1971) *Objects of Thought*. Oxford: Clarendon Press.

11. Reichenbach, Hans (1948) *Elements of Symbolic Logic*. New York: Macmillan.

12. Russell, Bertrand (1948) *Human Knowledge*. London: George Allen and Unwin.

13. Russell, Bertrand (1951a) *An Inquiry into Meaning and Truth*. London: George Allen and Unwin.

14. Russell, Bertrand (1951b) "Reply to Criticism." In *The Philosophy of Bertrand Russell*, Paul Arthur Schilpp (ed.), 681-741. New York: Tudor.

15. Russell, Bertrand (1956a) "Descriptions." In *Introduction to Mathematical Philosophy*, 167-180. London: George Allen and Unwin.

16. Russell, Bertrand (1956b) "On Denoting." In *Logic and Knowledge*, 41-56. London: George Allen and Unwin.

17. Russell, Bertrand (1959) *My Philosophical Development*. London: George Allen and Unwin.

18. Ryle, Gilbert (1963) "The Theory of Meaning." In *Philosophy and Ordinary Language*, Charles E. Caton (ed.), 128-153. Urbana: University of Illinois Press.

19. Strawson, Peter Frederick (1963) "On Referring." In *Philosophy and Ordinary Language*, ed. Charles E. Caton, (ed.), 162-193. Urbana: University of Illinois Press.

20. Toulin, Stefan Edelston and Kurt Baier (1963) "On Describing." In *Philosophy and Ordinary Language*, ed. Charles E. Caton, (ed.), 194-219. Urbana: University of Illinois Press.

Witold Marciszewski

THE PROBLEM OF EXISTENCE OF INTENTIONAL OBJECTS

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1. THE HISTORY OF THE PROBLEM

The relations between semantics and ontology are similar to that of two relatives, where one needs the other, yet is ashamed of them at the same time, due to their poor reputation. The coveted one is semantics, whereby ontology, as the most speculative discipline of philosophy, is the one enjoying infamy. Ontology comprises deliberations concerning various types, i.e. categories of beings, which, according to some, also include so-called intentional objects. This is a matter of great importance for philosophical psychology, for epistemology, as well as for semiotics. Therefore, dismissing the aura of disapproval, which surrounds some of the ontological deliberations, we will refer to them in this paper, in accordance with the needs dictated by the problems of semiotics, and especially to semantics, i.e. the discipline of semiotic research, which pertains to the relation between language and reality.

What importance has the concept of an intentional being for semiotics? It has numerous connections to the issue of intensionality, whose symbol (not proof, though) may be the following etymological relation: both words *intentio* and *intensio* stem from the same Latin verb *intendo*, the first as a gerund, the second as a passive adverbial participate (there are even authors, such as G. Bergmann, who tackle the issues of intensionality under the heading of "Intentionality"). In order to at least roughly explain, what this is about, let us remind ourselves in that which is mental, i.e. in representations, judgements etc. we distinguish the act and its contents. The crowning

argument in favour of this distinction is the fact that various acts may have the same contents; if for example two people think that it is getting dark, then there are two acts of the mind, but the contents here is the same. The notion of the contents comes from psychological considerations, but exceeds psychology, since the proper object of this discipline are the acts of the mind; their products are of at least equal interest to other fields of science, and among them, semiotics has a prominent position. There is a relation between the contents of the psychological acts and the contents of the language statements. This relation is two-fold: the contents of the statement intermediates between the contents of the author's psychological act, which for the contents of the statement is a sort of causative factor, and the contents of the psychological act of the recipient, invoked by the contents of the received statement. The content in the traditional Latin terminology was called *intensio* (hence the English *intension*), and all which is presently called intensionality is connected with this concept, which is of key importance for semantics. *Intentio* on the other hand, in this time-honoured terminology, is a mental act directed towards a certain object. This object was called by Brentano intentional and identified with the contents, whereby other authors, who, such as Kazimierz Twardowski, distinguished between the object of the thought from the contents of the though, saw this relation between contents and intensionality in a more complicated way, yet always treating these notions as inseparable. Therefore, the semantics' need of ontology is manifested by the problems of intensionality in such a manner that in order to locate precisely the notion of the contents of a statement, one needs to refer to the notion of the objects of mental acts, and the notion of the object is the basic idea of ontology.

* * *

After all these initial remarks, which were supposed to justify taking up of the issue of intentionality for the purpose of semantic research, now is the time for more semantic deliberations. It is advisable to start with the classical formulations of Franz Brentano. A natural link in our considerations would be to present the views of Twardowski, Meinong, Hesserl and Ingarden, yet this would be a too vast topic, requiring a separate discussion, I will therefore limit myself to mentioning them sporadically, registering the presence of such or other problem in the philosophy of these classical authors dealing with intentionality.

Brentano formulates the idea of an intentional object in the following manner:

"Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence (Inexistenz) of an object, and what we might call, though not wholly unambiguously, reference to a content, direction toward an object [..] or immanent objectivity (Gegenständlichkeit). Every mental phenomenon includes something like an object within itself, although they do not all do so in the same way. In a presentation something is presented, in judgement something is affirmed or denied and so on." After the word "object" in the place marked with an ellipsis there is also, in brackets, an important explanation that Brentano, when speaking of an object, does not mean as a real object; this fragment has been marked as a reference of the editor, Oskar Kraus, who informs us that the same view was expressed by Meinong and Husserl, but Brentano himself departed from it later on (Brentano 1924: 124f).

In the quoted text Brentano interchangeably uses the words "content" (Inhalt) and "object" (Objekt). Differentiation between content and object, which has become a permanent attainment of philosophy, was first introduced by Brentano's student, Kazimierz Twardowski, who presented i.a. the following arguments: 1. the content of the presentation belongs to the mind, whereby the object expressed with the use of this content is nothing mental; 2. therefore, the content is something real, which always exists, whenever we present something to ourselves, and the object does not exist in certain cases (e.g. if it is equipped with mutually exclusive properties). By saying that the object is not something mental, Twardowski did not mean that it needs to be something tangible outside of the mind; to be an object of presentation is not the same as to exist, and if we are speaking of existence, then we need to modify the meaning of this word by adding a relevant adjective, such as "phenomenal" or "intentional" (Twardowski 1971; cf. also Findlay 1963).

Such distinction between actual and intentional existence saves us from falling into the contradiction being the assertion that the object of presentation sometimes does not exist together with the assertion that each presentation has its object (and since it has it, then the object must exist). In such cases, when speaking of non-existence, we mean actual existence, and when ascribing existence we mean intentional existence.

This is how the issue was perceived in the times of Brentano and Twardowski. Further development thereof went in two directions. On the field of phenomenology, Husserl and Ingarden conducted extensive and thorough ontological analyses, which made it possible for Ingarden to apply the notion of the intentional object in semiotics, theory of literature, theory of music, etc. Apart from systematic movement there also developed an analytical-critical

trend propagated by British authors. These analyses brought some authors such as J. N. Findlay and G. E. M. Anscombe, to an even more deepened theory of intentional objects, and made others, such as A. N. Prior, to pose a number of questions.

Before we discuss these doubts, it is worth taking into account a certain methodological feature of ontological investigations. In order to have the right to say something like, "there are intentional objects" or "there are real objects" etc., two conditions must be met. Firstly, one needs to defend the postulated type of objects against the Ockham's razor, i.e. one needs to demonstrate that we need it for some theoretical reasons; only under this condition we will not expose ourselves to the allegation of multiplying entities beyond necessity. Secondly, one needs to show that by solving a problem thanks to such ontological theory, we do not get entangled in new theoretical difficulties, such antimony or glaring vagueness of notions. In other words — one needs to collect the "pros" and dismiss the "cons". The two following fragments will be devoted to these two tasks.

2. "PROS"

The arguments presented in favour of accepting intentional beings as a sort of objects, are of rather ontological or rather logical character. The word "rather" is to indicate that in this case both types of considerations are interconnected, and the bridge between them is the issue of ontological engagement of language, since this is a semantic-logical problem. Therefore, we will be dealing with the predominance of one aspect or the other, and not with purely ontological or purely logical analyses. In the present considerations the semantic-ontological aspect shall prevail, which at the same time will serve as an excuse to omit the ontological argumentation, meticulously and subtly developed by Meinong, Twardowski, Ingarden, Findlay and others.

In informal speech there seems to be used without any limitations a certain equivalent of the principle of existential generalisation, which on the basis of sentence $F(a)$ allows the acknowledgment of sentence (Ex) $F(x)$. Proof of such an intuitive application of this principle seems to be the following circumstance. When we ask about the veracity of the sentence *Dwarfs are very big*, then we will usually get the answer that the sentence is false; yet the sentence *Dwarfs are very small* is not considered to be false in the same manner as the previous one (this generalisation is based on numerous experiments with students, with whom in class I discuss the issue of strong and weak interpretation of general sentences). It is apparent

that the person answering does not apply here a strong interpretation of general sentences, in which case both of the above sentences are equally and identically false. He neither employs, however, the weak interpretation, by application whereof the two sentences are equally and identically true (as assertions on an empty set of beings contained in some set). The respondent acts as if certain sentences concerning dwarfs were true and other were false, i.e. as if he refused to acknowledge the emptiness of the name appearing as the subject, which further justifies the application of the principal of existential generalisation.

In order to describe this phenomenon better, it will be convenient to use the logical theory, i.e. Leśniewski's ontology. The above is supported by the fact that Leśniewski's system, unlike the classical logical calculi, reproduces a certain property of natural languages deprived of articles, such as Polish (on the margin it is worth noting that in such languages there are intuitive solutions like Russell's description theory, aimed at dealing with fictitious "beings," since the notion of description contains the idea of the definite article). What is meant here is the fact that the construction of all sentences formed by the functor "there is" is the same, irrespective of the fact whether by translation into the language of sets we will render "there is" with the use of the symbol of inclusion or identity, or belonging to the set. Therefore, moving from *a is b* sentences to *there is a* sentences, we will not have to, if we employ ontology's formalism, add each time which of the translations is correct in a given case.

The following sentence is the (only) axiom in ontology:

$$a \in b \equiv (x)\,(x \in a \rightarrow x \in b)\ \&\ (Ex)\,(x \in a)\ \&\ (x,y)\,(x \in a\ \&\ y \in a \rightarrow x \in y)\,.$$

Symbol $\in$ is read as *is*. The right side of this axiom is a conjunction, the first element whereof ascertains that whatever is a is also b, and the second element thereof ascertains the existence of a (we will in short render it as *ex a*), the third one says as much that there is one a at most (in short *sol a*). The last two elements characterise the concept material for our considerations, i.e. the concept of an object (the phrase *a is an object* will be noted in short as: *ob a*). Below is a relevant preposition:

$$ob\ a \equiv ex\ a\ \&\ sol\ a,$$

which follows from the ontology's axiom and the following definition: $ob\ a \equiv (Ex)\ (a \in x)$. And from this preposition there instantly follows the next one:

$$ob\ a\ \rightarrow ex\ a,$$

meaning: if something is an object, then it exists.

Let us create language M, composed of Leśniewski's ontology and a certain number of names, which may be substituted for variables in the ontology.[1] Let these be names taken from Homer's Odyssey. Certain sentences of language M are composed of these types of expressions, for example: *Odysseus is the father of Telemachus.* If someone acknowledges this sentence, being a substitution of the $a \in b$formula, then he should also acknowledge its consequence, i.e. *ex Odysseus.* The following formula presents itself as the basis for acknowledgement of these types of sentences:

(MR) Sentence S may be acknowledged as a thesis of language M, if S is in the text of the *Odyssey.*

This will, of course, be another kind of acknowledgement than the one concerning empirical sentences such as, for example, *The Sigismund's Column is cylindrical in shape.* There may appear the question, whether in such a case it is admissible to speak of acknowledgement, whether the use of the word is not metaphorical here. This question cannot be answered by reference to the common understanding of the sense of the phrases "to acknowledge a sentence" or "to believe that," since this sense is too loose, the scope of the notion too blurred to decide the matter in a definite manner. There is no other thing to do than to use a regulating definition, making sure that it corresponds to certain presupposed conditions. Such a natural condition seems to be the fact that our concept of acknowledgement should be aware of the difference in the approach towards the sentence *Odysseus is the father of Telemachus* and such sentences as *Odysseus is the father of Penelope* and *Odysseus is 180 cm tall.* Indeed, the notion of acknowledgement is useful for description of these differences, since we will say that the first of the abovementioned sentences is acknowledged; as to the second one — the negation thereof is acknowledged, and as to the third one — neither the sentence nor its negation is acknowledged. No other term specifying the approach towards a sentence is capable of fulfilling this role.

Another criterion concerning the accuracy of the regulating definition of acknowledging will be the fact of whether a concept defined this way will meet the conditions of some general characteristic of acknowledgement. Such characteristics are constructed on the basis of logical pragmatics and

[1]Such language, deliberately constructed for the purposes of the study of intentional objects, has been introduced by K. Ajdukiewicz (Ajdukiewicz 1965).

the so-called epistemic pragmatics. We will present this here as a means of example the **U** system from *Podstawy logicznej teorii przekonań (The Basis of Logical Theory of Beliefs)* for the reader to be able to ascertain, whether having adopted such characteristic, he would agree to use the word "acknowledgement" in the sense specified thereby, with respect to the approach, which he has with respect to sentences like: *Odysseus is the father of Telemachus* (*cf.* Marciszewski 1972). Let us assume that Bxp be an abbreviation for "x believes that p" (in other words: x acknowledges p; for certain technical reasons, however, we have adopted here the form of the reported speech). This expression is characterised by the following set of axioms from the **U** system:

(U.1) $Bxp \rightarrow \neg Bx(\neg p)$

(U.2) $Bx(p \rightarrow q) \rightarrow (Bxp \rightarrow Bxq)$

(U.3) *p is a tautology* $\rightarrow$ Bxp.

From those axioms there result i.a. the following prepositions:

(U.6) $Bxp \ \& \ Bxq \rightarrow Bx(p \ \& \ q)$

(U.7) $Bx(p \vee q) \rightarrow \neg(Bx\,(\neg p) \ \& \ Bx\,(\neg q))$

(U.8) $Bx\,(p \rightarrow q) \ \& \ Bx\,(\neg q) \rightarrow Bx\,(\neg p)\,.$

Moreover, two negative assertions are adopted:

(U.4) $\neg(x)(p)(Bxp \rightarrow p)$

(U.5) $\neg\,(x)\,(p)\,(\neg Bxp \rightarrow Bx\,(\neg p))\,.$

It is now easy to verify, whether acknowledgement of the **M** language sentences on the basis of the rule formulated above meets the above postulates with respect to meaning; if yes, then the one who still questions the aptness of such an extension of the concept of acknowledgement that it still covers the **M** language sentences, would have the obligation to propose a different set of postulates — such that would eliminate the acknowledgement of the **M** language sentences, without elimination thereby of the undisputable cases of acknowledgement.

The (MR) rule refers, as an example, to the language of the text of the *Odyssey.* In order to equip it with the desired level of generality, it should be extended to any and all texts, both mythological texts as well as fiction, scientific texts and everyday speech. What is more, we will considerably simplify the process of formulation of certain prepositions, if we extend the notion of text even further, so that it covers, apart from actual texts, i.e. written and spoken texts, also potential texts, i.e. texts expressed "in the mind", which have been realised in writing or in speech. And so for example, if somebody thought *Spring is late this year*, then even if he does not share this observation with somebody out loud, it still constitutes a

certain text, albeit a potential one. The language of such a text is this part of the language of the author, which has been used for production of the potential text.

Objects, whose existence is ascertained as a result of acknowledgement of some sentence by the rule similar to (MR), whereby acknowledging is understood within the sense of the **U** system, shall be called here intentional objects, and their existence shall be called intentional existence.

Before this kind of rule is formulated in all generality, certain terminological information is indispensable. The terms "intentional object" and "intentional existence" within the meaning derived from a rule similar to (UR), without precise determination, however, how acknowledgement should be understood, have been introduced by Kazimierz Ajdukiwicz in the paper titled *On the Notion of Existence* (1950).[2] This paper employs and uses this idea to define intentional existence by addition of this kind of rule to Leśniewski's language of ontology.

A much broader concept of the intentional object is presented in the works of Roman Ingarden; it covers the objects of all texts, the meanings of expressions, as well as the objects of thoughts, observations etc., also the works of art, music, and others. In other words — intentional objects in such a broad understanding are any and all products of the consciousness, i.e. of the mind, both psychological products (as described by Twardowski), as well as psycho-physical products; the former is described by Ingarden as primal intentional objects, whereby the latter is described as secondary (cf. Ingarden 1960a: 180).

Brentano, who was the first to assimilate the scholastic term of "esse intentionale" into the modern philosophy, included therein only certain psychological products, and therefore it was this class of objects that are subordinate to the class by Ingarden's notion, and exclusive, if we keep understanding text as an actual text, with the class of objects distinguished by Ajdukiewicz's notion.

Extension of the notion of text to potential texts makes it possible to include them into Ajdukiewicz's class of intentional objects at least some certain intentional objects as understood by Brentano, and the set created in this manner will be the (proper) part of the set of intentional objects as understood by Ingarden. Such proper notions of an intentional object have been adopted in the present deliberations and shall be subject to further analysis. The following phrase has been adopted as the criterion of

[2]Ajdukiewicz's "W sprawie pojęcia istnienia" (Ajdukiewicz 1965) is the Polish translation of this paper.

intentional existence.

(IC) If in an actual or potential text of language L there appears sentence S in the form $a \in b$and if acknowledgement of this sentence meets the requirements imposed by system **U**, then it will be possible to acknowledge this sentence as true in language L, and in consequence it will be possible to acknowledge sentences in the form $ob_i x$, $ex_i x$.

Letter i accompanying symbols ob and ex is used to indicate that the sense of the words "meaning" and "existence" used here is different than in the contexts of when we are speaking of actual existence, i.e. existence ascribed on the basis of empirical criteria.

The following conclusion results from the criterion (IC) and the prepositions of the U system:

Con (IC) If a sentence $a \in b$in L is internally contradictory or has internally contradictory consequences in language L (i.e. in the form $p \,\&\, \neg p$), then there is no basis to acknowledge sentence $ex_i a$ in L.

We will present this relation with use of an example. The following sentence shall be an example of a sentence of internally contradictory consequences:

(p) *Ameteros is a son of a childless mother.*

The following logical sentences result from (p):

(Ey) (*y is Ameteros' mother*) in short: $F(y)$

$\neg$ (Ey) (*y is Ameteros' mother*) in short: $\neg F(y)$.

Therefore, on the basis of U.3 and U.2 we have to agree with the assertion that:

1) $Bxp \rightarrow Bx\,(F\,(y)\ \&\ \neg F\,(y))\,,$

but on the basis of U.3 it is also true that

2) $Bx\ \neg(F\,(y)\ \&\ \neg F\,(y))$, wherefrom it further follows that due to U.1

3) $\neg Bx(F\,(y)\ \&\ \neg F\,(y))$.

Substituting 1 and 3 in the law of transposition we obtain the following:

4) $\neg Bxp$.

If one assumes that Ameteros, being the character in sentence (p) is not featured in any sentence of language L and sentence (p) is not acknowledged, as it has been demonstrated above, then there is no basis to accept sentence ex_i*Ameteros.*

As it follows from the above, the reservation present in (IC) that only those sentences should be considered acknowledged which are acknowledgeable within the meaning of system **U**, has material consequences: it provides no opportunity for sentences resulting in a contradiction to create intentional objects. The criterion of intentional existence provided by Ajdukiewicz

does not entail such consequences, since its requirement is limited to the condition of the sentence belonging to an actual text of a certain language (e.g. the text of the *Odyssey*), as being formulated in *oratio recta*. It will be then necessary to acknowledge the sentence ex_i*Ameteros* if for example the sentence *Ameteros is a son of a childless mother* appears in the text.

Thus the result could be different, if we introduced some other characteristics of acknowledgement, different from the one constituting the **U** system. The specification obtained thanks to the **U** system does not need to be the only proper one, its advantage is, however, the fact that it makes it possible to employ the notion of intentional model, which proves to be extremely convenient for certain semantic analysis. This is confirmed, for example by the deliberations of Jerzy Pelc, presented in the monograph titled *O użyciu wyrażeń*[3] (*On the Use of Expressions*). It would not be possible, if one allowed acknowledgment of sentences contradictory towards one another, since this type of language would be deprived of a model. Application of the notion of a model opens possibilities for the specification of those intuitions connected with the notion of the contents of the text, which were developed by R. Ingarden, when he described the content of a literary work as a set of intentional things, persons and events, etc. (Ingarden 1958). This instantly brings to mind the idea of an intentional model, which would make it possible to describe in more detail than previously various relations between the contents and the operations on texts, such as an abstract, a translation, or continuation of a text (for this purpose one could employ the relation of inclusion of one model in the other, the isomorphism of models, the extension of models, etc.) Moreover, such formulation of the criterion of intentional existence which does not entail the consequence that intentional objects are sometimes internally contradictory, seems to be consistent with common intuition, even with the intuition of children listening to stories. One does not need fairy tales to be probable, as it is expected in realistic novels; quite to the contrary — the less probable they are, the better (they are then more stimulating for the imagination), yet the improbability should not reach its upper limit being the logical impossibility. If we tell a child that the Wolf ate Grandma and then a minute later we tell them that the Wolf did not eat Grandma, than we will be confronted with an accusation that there is something fishy going on. Thus, the world of fairy tales, myths and tales may be one of many possible worlds, although it is never an actual world; and the degree of dissimilarity to the actual world is one of the criterions of

[3]Pelc 1971, chapter IV.

distinguishing literary genres.

It needs to be emphasized here that conclusion Con (IC) is not tantamount to a firm assertion that what is contradictory cannot be attributed "esse intentionale". This formulation is more cautious: it advises only to refrain from ascribing this manner of existence to what would correspond to expressions present in any text which are contradictory with respect to one another. Such a presentation of the case, not closing the problem yet, is a reflection of the fact that the full data necessary for determination of the ontological status of internally contradictory items, for example hornless unicorns, are not available. It seems on one hand that since we sometimes think of contradictory items then they are the objects of our thoughts and therefore are intentional objects. Yet, do we indeed think of them in the same way we think of actual or possible objects? It is after all said sometimes, for example by determination of necessary sentences, that these are sentences whose negation "is impossible to think of", and this means as much that their negation results in a contradiction; therefore behind this we have an intuition that it is impossible to think of contradictory objects. Thus, there are two meanings of the word "think" and this ambiguousness and instability is inherited by the expression "intentional object," i.e. "the object of the thought." The (IC) criterion prevents introduction of the contradictory to the realm of intentional objects, and at the same time it avoids determining whether this means of prevention is to be merely tactical, used until a relevant substantial solution is found, or it is to be firm and final.

3. "CONS"

A favourable attitude towards the view on existence of intentional objects, represented in the preceding section, is motivated by reasons of theoretical convenience. It is convenient to adopt the notion of an intentional being, since it makes it possible to construct a semantic theory which well presents the common way of thinking on literary works and the like. We believe the latter with regards to texts which are about something, whereby this something is composed neither of the states of mind of the author, nor the elements of empirically given reality. And since this is neither a domain of the mind nor the domain of empirical reality, then there is nothing else left but to assume that we are dealing with some third world.[4]

[4]It is worth adding that firm access to the concept of the third world, motivated by the deliberations from the field of philosophy of science, was presented by Karl Popper (Popper 1968).

Such argumentation provides grounds for the conclusion intended by it, yet provided that this conclusion does not result in a contradiction or even paradoxes and provided that attempts at construction of competitive theories, which would have no worse explanatory power, would be as simple, and additionally would do without an additional type of beings, fail. The latter argument would provide such theories with an advantage over the discussed theory. Presently we will consider various attempts at questioning the concept of intentional objects, these attempts will later be subjected to critical analysis, aimed at what is an indispensable supplement of construction endeavours, and what has been described by one of the medieval authors as "destructio destructionis".

A thorough critical analysis of intentionality, which fairly well described the present condition of the issue, has been carried out by A. Prior in the book entitled *Objects of Thought.* Prior formulates a certain basic difficulty presented by the concept of an *object of thought*, he indicates three possible ways of getting rid of the difficulty, yet ends up criticising them.

The basic difficulty, being the starting point, consists therein that the two assertions irresistibly coming to mind when someone is thinking of something are inconsistent with each other (we are therefore dealing with a kind of a paradox). These are the following assertions.

(1) When x thinks of y, x strives for y, x reveres y etc., then y is always an element of this relation to the same extent x is, and therefore y exists.

(2) In certain cases, when x thinks of y, there exists no y (Prior 1971: 119, 127).

One may attempt to reconcile these assertions by various means. Prior lists three, but all of them seem unacceptable to him. Below are the three alternative attempts at solving the dilemma:

(a) It is possible to assume that thinking of a real object is an activity entirely different from thinking of an object deprived of reality.

(b) It is possible to assume that when thinking of something we are not in relation with this something, but with the "idea" of this something, in which idea in certain cases represents a real thing and in other cases this type of representation does not occur.

(c) It is possible to assume that there are stronger and weaker modes of existence, that all objects of thought without any exception have at least some weak way of existing, and only a certain subset thereof is characterised by a strong mode of existence (Prior 1971).

In what manner each of attempts (a), (b) and (c) could prevent the

antimony which would follows from joint acknowledgement of (1) and (2)? What difficulties follow from each of these attempts? Can these difficulties be overcome, and if yes, how? These are the questions waiting to be answered.

In order to make the formulation of the first of those problems clearer, let us reformulate (1) and (2) in such a manner that their contradictory character will be emphasized.

(1') Whenever x thinks of y, y exists.

(2') Sometimes x thinks of y, whereby y does not exist.

It is now clearly visible that these sentences contradict each other, and it would be possible to avoid the contradiction, if it were assumed that either the word "thinks" or the word "exists" (or both) have different meanings in either of the sentences.

Proposal (c), the most natural and supported by a strong tradition, whose key representative was A. Meinong, consists in diversification of the meanings of the word "exists". This is the same direction, which has been assumed in the constructive part of this paper, we will therefore discuss it first.

Prior himself does not provide arguments against this standpoint, he refers however to the criticism thereof presented by Russell. The same criticism by Russell is referred to by Jerzy Pelc in the abovementioned monograph, who agrees with Russell, as one may suppose, on the basis of the deliberations denying the sentences of a literary text with any logical value. This denial is justified only when it is assumed that by the so-called fake use of an expression, characteristic for literary texts, this expression is deprived of denotation, i.e. when one agrees with Russell's statement expressed in the following words:

"Many logicians have been driven to the conclusion that there are unreal objects. It is argued, e.g., by Meinong, that we can speak about the golden mountain, the round square, and so on [...] In such theories, it seems to me, there is a failure of that feeling for reality which ought to be preserved even in the most abstract studies. Logic, I should maintain, must no more admit a unicorn than zoology can; for logic is concerned with the real world just as truly as zoology, though with its more abstract and general features. [...] To maintain that Hamlet, for example, exists in his own world, namely, in the world of Shakespeare's imagination, just as truly as (say) Napoleon existed in the ordinary world, is to say something deliberately confusing, or else confused to a degree which is scarcely credible. There is only one world, the 'real' world: Shakespeare's imagination is part of it, and the thoughts that he had in writing Hamlet are real. So are the thoughts that we have

in reading the play. But it is of the very essence of fiction that only the thoughts, feelings, etc., in Shakespeare and his readers are real, and that there is not, in addition to them, an objective Hamlet" (Pelc 1971: 129f).

What role in this deduction is played by the view on the object of logic expressed in the first part of the above paragraph? One may suspect that in the works of authors attacked by Russell there is the following assumption: since sentences concerning unicorns etc. are consistent with the rules of logic, therefore they have the right to some sort of being. Russell's response is as follows: they cannot be consistent with the rules of logic, since logic pertains to the real world. This view on logic, represented by Russell at the time when he was writing his *Introduction to Mathematical Philosophy* is quite isolated, since it is commonly accepted that the rules of logic are complied with — as stated by Leibniz — in all possible worlds; sentences concerning unicorns, provided that they do not result in contradiction, refer to one of the possible worlds, which, as it happened, had not been lucky enough to come to existence.

The second part of Russell's text presented above, which reduces the supposed intentional objects to psychological phenomena, is more important than the controversy concerning the object of logic. Such reductionism constitutes a self-imposing alternative for the concept of intentional objects. Let us trace the line of this reduction with an example. We have a sentence from *Iliad* (the beginning of book XVI)

(H.1) *Patroclus drew near to Achilles.*

This is a sentence which after relevant editing falls under the pattern $a \in b$, and therefore it results in the consequence *ex Patroclus*. How to avoid this consequence? Russell's recipe seems to be as follows: since no Patroclus exists, there only exist thoughts on Patroclus, then sentence ex_i*Patroclus* is an abbreviation of saying: *There exists someone who thinks about Patroclus.* Let us write it down in a shortened formula, *where* T means *thinks about* and a pertains to *Patroclus*:

(H.2) $ex_i a \equiv (Ey)\,(y\ T\ a)\,.$

It is now sufficient to treat sentence (H.1) in the same manner, i.e. transform it into a sentence which states that: someone thinks that $a \in b$; where a means *Patroclus*, b means *drawing near to Achilles*; and T means *thinks that*:

(H.3) $a \in b \equiv (Ey)\,(y\ T : a \in b)\,.$

The aptness of this reconstruction is demonstrated by the fact that the left part of the equation of (H.2) results in the field of ontology from the left part of (H.3) and that an analogous resulting takes place on the other side;

although it is difficult to demonstrate the latter precisely, as long as we do not dispose of the formal theory of functor T, yet intuitively it is obvious that if someone thinks that $a \in b$, then at the same time he is thinking about a. Assertion (H.3) will to an extent resemble the (IC) criterion, since someone's thinking that $a \in b$constitutes a certain potential text. There is however, a material difference, since according to (H.3) the thing that creates the intentional state of things is the mere fact of thinking about them, whereby the (IC) criterion demands acknowledgement in the specified sense prescribed by the **U** system, whereby it protects itself against impossible "objects". From the point of view of ontology as the first philosophy (it should not be confused with Leśniewski's ontology), one may see in (H.3), as well as in (IC) an expression of the fact that intentional objects are existentially heteronomous in the sense intended by Ingarden (Ingarden 1960b: 97).

The conclusion that since this kind of reduction of intentional objects to real objects (to be more precise: reduction of sentences concerning the former to sentences concerning the latter) has been successful, then the notions of intentional object and intentional existence are redundant would be premature. The situation here is the same as in the case of each new notion introduced with the use of a classical definition. The fact that it can be eliminated thanks to translatability means only that it is not indispensable, but by no means that it is useless. It is hardly possible to imagine any more extensive scientific theory, for example arithmetic or mechanics, doing without terms introduced by means of definitions. The notion of an intentional object does so well i.a. in the research of literary works (as demonstrated by Ingarden's research), as well as in certain epistemological research (as demonstrated by those of Ajdukiewicz), that it is justified to adopt it, even if only as a derivative term. It remains an open case whether formulations such as (H.3) or (KI), which would be adopted as definitions, are characterised by the non-creativity required from a definition. If they are creative in a sense that they lead to new assertions, then it would be impossible to derive without them, then they are bad definitions (which would be a reason to question the success of the reduction), yet they could be good philosophical assertions.

As to the difficulty formulated by Prior, which would be to consist in the inconsistency of assertions (1) and (2), it resolves itself simply in that the word ("exists") in (1) should be understood within the meaning of intentional existence, as specified by (IC), and the identical word in sentence (2) refers to real existence.

Having therefore opted for the solution similar to (c) and having outlined the line of defence of this standpoint, there is nothing left to do, but to

assess the two remaining proposals. As to (b), it is entangled in all of the epistemological difficulties which are characteristic for so-called indirect realism. This is a separate and complicated problem, therefore there is no need to go into it in the situation, when adoption of a solution of the (c) type is sufficient to lift the difficulty indicated by Prior, i.e. the juxtaposition of sentences (1) and (2). For the same reason one could refrain from dwelling upon point (a), yet looking into it closer will let us observe certain peculiarities and dangers accompanying the discourse on intentional objects.

Let us now assume that the word "exists" has been used in (1) and (2) in the same sense, i.e. in the sense of intentional existence. Is it possible in such a case to acknowledge both words without falling into the trap of contradiction? It would be possible if the word "thinks" could be ascribed a different meaning each time, and we would be dealing for example with two different types of thinking. As an attempt, in order to consider a certain possibility, we will assume that when thinking about something we always somehow take into account the existential moment, i.e. we think of this something as of something that exists, does not exist (e.g. something fictional) or something that is neutral with respect to existence, the latter case takes place when we suspend our judgement as to existence, either as a result of an actual lack of knowledge or in order to place ourselves in a certain cognitive situation (Descartes' methodological doubt or Husserl's *epoche*). We shall determine the first two cases, not excluding the possibility of yet other approaches to existence, with the use of the following conditions, wherein the symbols TE and TN are, respectively, abbreviations of the following expressions "thinks of the existing" and "thinks of the non-existing".

C.1 $xTEy \equiv xB(ex\ y)$

C.2 $xTNy \equiv xB\,(\neg ex\ y)\,.$

Let us know distinguish the two meanings of the word "thinks", appearing in the set of sentences (1) and (2), differentiating them with the use of symbols TE and TN:

(1") $(x)(xTEy \rightarrow ex_iy)$

(2") $(Ex)\,(xTNy\ \&\ \neg\ ex_iy)\,.$

Thanks to this differentiation, the pair of sentences (1) and (2), if adequately interpreted as (1") and (2"), is not threatened by contradiction, even if the word "exists" is used each time within the same meaning. As to the veracity of (1") and (2") — it is guaranteed by our criterion of intentional existence, which on the basis of the fact that a certain sentence is acknowledged allows to infer that a corresponding intentional "fact" takes

place, and the expressions $xTEy$ and $xTNy$ are equivalent, by virtue of C.1 and C.2, to relevant assertions concerning acknowledgement.

Thus, in this way it is also possible to avoid the mutual inconsistency of sentences (1) and (2), which threatens, if one does not distinguish the meanings in one of the two pairs of shape-identical expressions appearing therein. This, however, is not a general solution, since it refers only to the realm of intentional objects; if in both cases we meant real existence, then irrespective of the fact that sense is ascribed to the word "thinks" in sentence (1), this sentence will always be false.

The pair of sentences (1") and (2") presents a certain difficulty, which requires one more distinction in order to overcome it. Sentence (2") may be ascribed the sense that it will turn out to be false: if x thinks of y as of a non-existing object then this results in the fact that y is the object of the thoughts, i.e. an intentional object, and therefore y exists intentionally contrary to the thesis of (2"). We are protected against this charge by the distinction introduced by Ingarden, distinguishing between the structure of the intentional object and its contents (Ingarden 1948: 256 et seq.: chapter X, § 45 a). The contents of certain conceptual structures may include the fact that they do not exist, as was the case with the emperor's clothes in Andersen's tale. These clothes not only do not exist in reality, but they do not exist also in the tale itself, in the fictional world created thereby. And they do not exist because the sentence on their non-existence is included into the text of the tale and is acknowledged in the language thereof; this is therefore a situation to which (2") pertains. This situation should for this reason be distinguished from the situation in which an intentional object does not exists with respect to the structure. i.e. it has not been constructed by any mental acts; therefore there is no text, either actual or potential, which would mention such an object. This difference could be noted with the use of a special notation, for example with the formula $\neg\ (ex_i)y$, when the acts creating y have not occurred, and with the formula $(\neg\ ex_i)y$, in case an act establishing the non-existence of y in a certain intentional world has taken place; the brackets would indicate the contents of the intentional object, which in the first instance includes existence and in the second — non-existence.

4. CONCLUSION

The problem of intentional objects is a difficult issue, connected with many riddles and paradoxes. If one believes that it can be solved, one needs to approach it cautiously and with little steps, so as not to fall into the trap

of ambiguities and aporias along the way. What does a step made in these considerations consist of? In order to see it, one needs to point out certain properties of the method applied. This is a method, which most appropriately should be called analytic, and to be more precise — reconstructionist — whereby reconstruction is perceived as one of the methods of analysis. It is distinctively different (which does not mean any competition) from the phenomenological method, which was applied to intentional objects by Husserl, Ingarden and others. A phenomenologist starts with what is given, i.e. what in an irresistible way appears in the mind, and abstracts from what this has to do with actual knowledge, common sense and some philosophical assumptions (there issues may later be taken into consideration, however they are omitted at the starting point). The second characteristic feature of phenomenology is the way it communicates data, which does not aspire to be adequate with respect to the contents which are to be expressed. One cannot pick holes in the discourse produced by such an author, since particular words and sentences even gain sense first in a wider context. This is not evidence of any assertions or definitions of any concepts. This is a kind of heuresis, directing the recipient towards experiences and line of thinking which were shared by the author. The philosophical language in this case has the function which was called agitating by Ajdukiewicz, but this word, had it been adopted by phenomenologists, would have needed to lose any pejorative shade. Since this is exactly what is intended — to agitate (agitatio) the mind of the recipient, so that he starts and continues in the right direction.

The matters are different in the case of analytical philosophy. The starting point is to formulate certain conditions, which should be met by philosophical notions, for the notions to be capable of being a part of a theory. Apart from obvious formal requirements provided by logic, most often there functions certain substantive requirements, stemming from ontological assumptions — from the answers to the question "what does exist?" adopted a priori. If one assumes, as Russell did at some point in time, that the least disputable type of beings are the sensorial data — then all other objects must demonstrate the same indisputability or must be reduced to the latter by means of definitions. Again, if one assumes that the existence of physical objects is indisputable, then they become the model of obviousness and the basis for any reductionist attempts. Any category of objects may be distinguished, but still some category must be, which after all is connected with the reductionist approach, since it is first possible to conduct a definitional reduction of other categories of objects to the distinguished category, which constitutes the very core of the activity of

an analyst-reductionist, inspired by the slogan of not multiplying beings (whereas a phenomenologist represents the standpoint that the number of beings should not be unnecessarily limited). Whether a reduction is successful is decided i.a. by the correctness of the definitional activities. In each notional construction there is as much content as provided thereto by the terms it applies, i.e. the point of gravity rests by striving for terminological precision.

The attempts made in this paper fall into the analytical stream. As the basis for reduction we have adopted the assumption on existence of physical and psychological objects; the latter include the acts of acknowledgement. Acknowledgement, being a primal notion, is characterised by the **U** system postulates. The notion of existence, which is also primal, i.e. non-definable, is characterised axiomatically on the basis of Leśniewski's ontology. With the use of these two notions one specifies the notion of the intentional object and the intentional being.

The use of Leśniewski's ontology, which is extended by certain terminological constants, e.g. from the language of the mythology, and a certain rule of acknowledgement, was a step first made by Kazimierz Ajdukiewicz. Then, a certain next step was made in this paper, namely, we have determined the notion of acknowledgement in such a manner, that it is prevented from being included into the category of intentional objects which are logically impossible (contradictory), whereby Ajdukiwicz's criterion allows contradictory objects into the family of intentional objects. This step may be found to be controversial, yet it introduces the most important question of what the relation between intentionality and logical possibility is.

Reduction, with the use of the (IC) criterion, of the intentional objects to the category of ontological objects, which are considered to be more basic (physical and psychological objects), does not need to result in resigning from the notion of the intentional object. This notion has already proved its usefulness and theoretical significance, which provides a decisive argument in favour of its presence in philosophy's notional apparatus, in particular in the apparatus of the philosophy of the language.

Bibliography

1. Ajdukiewicz, Kazimierz (1965) "W sprawie pojęcia istnienia." In *Język i poznanie*, vol. II, 143-154. Warszawa: PWN. In English: "On the Notion of Existence" Studia Philosophica 4 (1951): 7-22.

2. Brentano, Franz (1924) *Psychologie vom empirischen Standpunkt.*

Leipzig: F. Meiner.

3. Findlay, John Niemeyer (1963) *Meinong's Theory of Objects and Values.* Oxford: Clarendon Press.

4. Ingarden, Roman (1948) *Spór o istnienie świata*, vol. II. Kraków: PAU.

5. Ingarden, Roman (1958) "O formie i treści dzieła sztuki literackiej." In *Studia z estetyki,* vol. II. Warszawa: PWN.

6. Ingarden, Roman (1960a) *O dziele literackim,* Warszawa: PWN.

7. Ingarden, Roman (1960b) *Spór o istnienie świata*, vol. I. Warszawa: PWN.

8. Marciszewski, Witold (1972) *Podstawy logicznej teorii przekonań.* Warszawa: PWN.

9. Pelc, Jerzy (1971) *O użyciu wyrażeń.* Wrocław: Ossolineum.

10. Popper, Karl (1968) "Epistemology without a Knowing Subject." In *Logic, Methodology and Philosophy of Science III* (Materials from the 3^{rd} Logic Congress). Amsterdam.

11. Prior, Arthur Norman (1971) *Objects of Thought.* Oxford: University Oxford Press.

12. Twardowski, Kazimierz (1971) "O treści i przedmiocie przedstawień." In *Semiotyka polska*, ed. Jerzy Pelc, Warszawa: PWN.

Urszula Niklas Peterson

ON SOME SEMANTIC ASPECTS OF MEINONG'S THEORY OF OBJECTS

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Meinong's theory of intentional objects and the act of judgment, formulated primarily in his work, "The Theory of Objects," is of interest not only from the point of view of semantics. In his description of cognitive acts, and psychical acts in general, Meinong makes use of the concept of intentionality. He took that concept from Brentano who introduced it in order to distinguish between psychical and physical phenomena. For Brentano, the distinctive characteristic of psychical acts is that they are directed toward their objects: we admire something, perceive something, or form a judgment about something. Although the act of judgment does involve a specific psychical attitude toward its object, Meinong insists that psychological analysis is insufficient for the purpose of building a complete theory of judgment. The act of judgment is a double fact (*Doppeltatsache*) in the sense that it involves the subject's psychical act as well as a specific object to which the act is directed. A full description of that cognitive structure, free of the charge of psychologism, clearly requires an analysis of the object of judgment. Consequently, Meinong's theory complements the psychological analysis with an ontological description of the objects of cognition and thus constitutes a theory of knowledge.

Meinong's investigation seems to include a semantics that, however, remains only implicit in his theory, as his analysis is epistemological in nature. This paper will attempt to reveal the semantic aspect of Meinong's theory; this is a challenging undertaking since his intricate theory is articulated in a language rich in metaphors and philosophical neologisms. The interpretation

proposed in what follows is justified and not only through a purely historical interest in the philosopher; his ideas recur in some contemporary works. A form of contemporary philosophical logic, named by its adherents "free logics," i.e., logics free of existence assumptions, investigates the possibility of building a logic in which the nominal non-denoting expressions would be admitted without a paraphrase (Woodruff 1970: 121-142). Russell formulates a well known opposite view in his theory of definite descriptions in which a paraphrase is requisite for any non-denoting expression (Russell 1905). In "free logics" two ideas are pursued, both of which Russell rejected in "On Denoting." First, Frege's idea, further developed by Strawson, to treat the propositions that include non-denoting expressions as meaningful but devoid of logical value; second, Meinong's proposal to solve the problem by postulating subsisting objects.

Our assumption is that if, according to Meinong, every cognitive act is directed to its object, then every proposition that articulates such an act has an object as its correlate. A description of this object and an interpretation of the relation between the proposition and its correlate are undoubtedly interesting from the semantic point of view.

* * *

Meinong's investigation in "The Theory of Objects" opens with the claim that judgment is about objects that are not constituents of the act of judging. In the case of judgments about empirical objects, which are located in space and time, it is natural to think of them as objects of knowledge and to assume that the subject stands to them in a cognitive relation that can be expressed in a statement of the type "I believe that Mount Everest exists." But we also make judgments about what does not really exist. This is obviously true of mathematics. Geometry, Meinong observes, does not concern real figures, and numbers do not exist along with what is numbered. In that case, our cognitive interest is directed toward the ideal objects that subsist (*bestehen*), such as relations or numbers. Furthermore, we also make judgments about possible objects, such as the golden mountain; objects of that sort are possible in the sense that empirical circumstances prevent us from asserting their existence. Judgments about ideal and possible objects involve a cognitive relation between the judging subject and the objects that exist in a weaker sense, i.e., they subsist. The contradictory, hence impossible, objects present difficulties of their own. When we make a judgment about the square circle, to which we attribute the properties of being round and square, we cannot ascribe to it any mode of being. Meinong considered

ascribing to contradictory objects pseudo-existence (*Pseudoexistenz*), but abandoned that solution as unsatisfactory.

Meinong holds the view that since the propositions expressing judgments sometimes include non-denoting phrases, the intentional object of judgment cannot be identified with what the nominal expressions designate. Hence the intentionality of judgment requires that the act of judgment be directed to its objective (*Objektiv*), that is, its specific intentional object. The objective is the object intended by the that-clause of the type "I believe that." If one judges that the antipodes exist, the intentional object of the judgment is the objective intended by the phrase "the antipodes exist." Furthermore, Meinong holds the view that the objective is the correlate of judgments as well as assumptions (*Annahmen*). Although judgment and assumption have intentional objects of the same type, the judgment involves a belief concerning what really is the case, while such commitment is absent in the assumption.

If we assert that the antipodes exist, then the existence of the antipodes, i.e., the objective of our judgment, merely subsist, while the antipodes themselves exist in reality. The objective subsists regardless of the ontological status of the object the that-clause talks about, and its subsistence secures the intentionality of judgment. The cognitive relation involved in judgment does not obtain between the knowing subject and one or several objects the proposition is about; it is always obtained between the subject and the objective.

According to Russell's multiple relation theory of judgment, the act of judgment is a multiple relation of the judging subject to several terms that include constituents of the proposition and their arrangement. For example, Othello's belief that Desdemona loves Cassio is true if the terms are arranged as follows: Othello, Desdemona, to love, Cassio; any other arrangement would make the belief false. In contrast to Russell's theory, Meinong interprets judgment as a dual relationship between a judging subject and an objective, which is a single object.

Arguments in support of the interpretation of judgment as a dual relation are developed by Quine in his paper "Quantifiers and Propositional Attitudes." Expressions of the kind "I believe that," called propositional attitudes, prove difficult to quantify. The statements:

(1) John thinks of unicorns;
(2) John thinks of lions;
(3) John believes that a certain man in a hat is a spy;

can be rendered respectively as:

(4) $\bigvee_x$ (x is a unicorn . John thinks of x);
(5) $\bigvee_x$ (x is a lion . John thinks of x);
(6) $\bigvee_x$ [(x is a man in a hat . John thinks that x is a spy) . $\bigwedge_y$ (y is a man in a hat $\rightarrow$ x = y)].

The paraphrase (4) does not adequately render the meaning of (1) because of the non-existence of unicorns. The paraphrase (5) suggests that John thinks of an individual lion or several lions, while (2) makes no such suggestion. The incorrectness of rendering (3) by (6) will become clear if we consider the following example. Let's assume that John has glimpsed at a certain man in a hat in the dubious circumstances that make him think the man is a spy. However, John does not know that the man in question is his brother Peter, hence the statement:

(7) $\bigvee_x$ [(x is Peter . John thinks x is a spy) . $\bigwedge_y$ (y is Peter $\rightarrow$ x = y)],

is false because John does not think his brother is a spy (Quine 1956: 178-180).

The quantification of belief propositions from the outside implies interpretation of (1) — (3) in the *relational sense*. Such an interpretation assumes the subject of having a belief relates to the objects that the that-clause is about, which leads to the difficulties that the above examples show clearly. According to Quine, incorrectness of the external quantification reveals the peculiar role the nominal expressions play in that-clauses: they are "referentially opaque" (Quine 1956: 183). The problems they create can be eliminated by the quantification within belief propositions; for example, "John believes that $\bigvee_x$ (x is a unicorn . x has four legs). In that case belief sentences are interpreted in the *notional sense*, which means they express the relation between the subject having a belief and the intension, that is, the proposition expressed by the that-clause.

There is a degree of similarity between the concepts of relational and notional sense and Meinong's theory of objects. As we observed earlier, Meinong's investigation, which is epistemological in nature, indirectly implies a semantics based on the idea of intentionality of cognitive acts. He postulates the referential understanding of that-clauses precisely because the statements

that articulate judgments may include some non-referential expressions. From the point of view of semantics, the intentionality of judgment becomes inseparable from the meaningfulness of the proposition that articulates a judgment. Neither the intentionality nor the meaningfulness depend on whether the nominal expressions refer to any objects, but they depend on the fact that the proposition itself names a certain object. Hence a statement is meaningful and can express a judgment even if the expressions it contains are empty names, i.e., they do not name any existing objects. According to Russell's theory of descriptions, developed in "On Denoting," such expressions are objects in a merely grammatical sense, and his theory offers a method of transforming propositions with the denoting phrases, including empty names, into propositions without such phrases (Russell 1905). Nominal expressions can play the proper role of objects only if they name objects known by an acquaintance, that is, if they are proper names.

A proposition is meaningful and expresses a thought, Meinong maintains, because it is related to the objective given to a judging subject. The objective is distinct from but semantically related to the proposition: the proposition names the objective. The semantic interpretation of propositions as expressions that have been denoted has been widely accepted among the followers of Frege. Furthermore, the objective is not a psychic object created in the act of judging, since the same person at different times, or several persons on various occasions, may assume different cognitive attitudes toward one and the same objective. In "The Theory of Objects," Meinong repeatedly rejects psychological interpretations of his position, especially a psychological interpretation of judgment. It is worth mentioning that his theory does not preclude an ontological interpretation of objectives as timeless entities, but a discussion of that possibility goes beyond the scope of this paper.

Meinong makes use of the concept of objective to address two semantically troublesome problems: the negative existential propositions and the propositions that assert something of non-existing objects. In order to deny that something exists, e.g., to assert that Sherlock Holmes does not exist, we must know whose existence we are denying, hence we must use the expression "Sherlock Holmes" as referring to something. If so, the negative existential propositions would always be false. If the expression is used non-referentially, we do not know what we are talking about, and it becomes doubtful whether the proposition is meaningful.

There are two ways to solve the above difficulty. The first solution is to distinguish between two concepts of being: real existence and subsistence; the latter applies to the entities that have no spatial and temporal location.

Russell adopted that solution in his work *The Principles of Mathematics*, written in 1903. Linguistic expressions refer to entities, but only some of these entities have real existence while others merely subsist. Hence all negative existential propositions are false if they deny the subsistence of their objects, and may be true if they deny the existence of real objects.

The second solution of the problem of the negative existential propositions retains the usual concept of existence and seeks the source of the difficulties in the misleading linguistic form of the propositions themselves. According to Gilbert Ryle, propositions of the sort "Satan does not exist" are systematically misleading because they appear to have the syntactical form of the subject-predicate propositions. In spite of the grammatical appearances, the subject of the proposition conceals a predicative expression that comes to view in a suitable paraphrase. Thus "Satan does not exist," Ryle argues, can be paraphrased as "nothing is both devilish and alone in being devilish," or "nothing is both devilish and called 'Satan'," or even "some people believe that someone is both called 'Satan' and is infinitely malevolent, but their belief is false." None of these statements, Ryle argues, are about Satan; instead, they are about the word 'Satan' or else about people who misuse that word (Ryle 1931-1932: 143-149). According to Russell, on the other hand, the negative existential propositions are not about what the grammatical subject supposedly refers to, but about the propositional functions the appropriate paraphrases reveal. To say that there are no unicorns is to say that the propositional function "x is a unicorn" is always false (Russell 2009: 66-85).

Meinong's position appears closer to the first of the above solutions. The that-clause "that the antipodes exist" names the objective of being (*Seinsobjektiv*) that subsists independently of the existence of the antipodes. If we maintain that Sherlock Holmes does not exist, the objective of non-being (*Nichtseinsobjektiv*) subsists in spite of the non-existence of a person so named. The affirmative as well as the negative existential propositions refer to and name their respective objectives independently of whether the subjects of those propositions are used referentially or not. To say that the gold mountain does not exist is to deny its real existence; to say the square circle does not exist is to deny existence in a weaker sense of the word, that is, to deny the subsistence of an impossible object. In both cases what subsists are the corresponding objectives of non-being.

At this point the following question arises. Since the expression "square circle" names no object, even a subsisting one, does the proposition about the non-existence of the square circle speak of nothing? Meinong proposes

to answer this question as follows: A contradictory object does not exist in either of the senses being discussed above; it neither exists nor subsists. Nonetheless, it remains an object of knowledge, since any object that is not real must at least be grasped as non-being. Meinong does not cover up the paradoxical nature of his position. He admits that one can say: "There are objects of which it is true that there are no such objects," but admits that the paradox demands an even closer examination of the matter (Meinong 1960: 83).

In order to develop further and clarify his position, Meinong introduces another type of objective, namely *Soseinobjektiv*. If we ascribe contradictory properties to an object, then we must grasp it mentally. In other words, it is possible to consider the properties of an object regardless of whether we judge that the object exists or not. *Soseinobjektiv* is the objective correlated with propositions that predicate something of the non-existing objects or the objects whose existence are not under consideration. The subsistence of *Soseinobjektiv* does not depend on the referential function of the subject of the proposition; its subsistence is guaranteed by the principle that *Sosein* is independent of *Sein*. At this point Meinong introduces the concept of pure object (*Ausserseiend*), which remains beyond being, and is known regardless of whether the question of its existence has been decided at all or even if its existence is denied. Meinong's theory stands in a tenuous relation to metaphysics if we understand metaphysics as the investigation of everything that there is, since the theory of objects deals with all objects of knowledge, including pure objects.

In "On Denoting," Russell accused Meinong of crowding the world with the objects that violate the principle of contradiction, such as the square circle (Russell 905: 484). Russell's criticism is misguided since, according to Meinong, the square circle is an impossible object and thus remains beyond being. The opposition of being and non-being applies to the objectives, not to pure objects. Meinong tried to improve his ontology by banishing the contradictory objects from the domain of being, while Russell was comfortable with introducing them in his early book *The Principles of Mathematics*. Although Meinong denied any form of being to the contradictory objects, he introduced the objectionable concept of pure object, which is non-existing but still remains an object. This not only results in an excessive ontological complexity of the theory of objects, but the meaning of pure object eludes semantic analysis.

The above difficulties of Meinong's approach will become more obvious when we consider once more the negative existential propositions. His position

is close to the above discussed first solution to the problems those propositions create. It consists in introducing the distinction between existence and subsistence, but refrains from ascribing being to the contradictory objects. He does that at the price of introducing the ontologically obscure pure object. It should be said, in Meinong's favor, that he rejects the second solution to the problem because he does not want to deviate from the ordinary use of language. The second solution calls for a transformation of the negative existential propositions into statements that do not have empty names as their subjects, but the meaning of the paraphrases deviates from the linguistic intuitions of ordinary speakers. For example, if a parent tells a child that Santa Claus does not exist, both the parent and the child think they are talking about Santa Claus rather than something else.

According to the already mentioned principle that *Sosein* is independent of *Sein,* a proposition that has *Seinsobjektiv* as its objective does not belong to *Sein* or *Nichtsein* propositions. Therefore the *Sosein* proposition

(8) A golden mountain is golden

cannot be correctly rendered by the *Sein* proposition

(9) $\bigvee_x$ (x is a mountain . x is golden).

The incorrectness of the paraphrase becomes clear when we consider the logical values of both propositions. According to ordinary language intuition, (8) is true while its paraphrase (9) is false, as is the case with all propositions in which a descriptive phrase has a primary occurrence. There is a similar discrepancy when a descriptive phrase has a secondary occurrence, that is, when it is the subject in the that-clause (Russell 1905: 489-490). The statement

(10) I believe, that a golden mountain is golden

is true. Its paraphrase, according to the theory of descriptions,

(11) I believe that $\bigvee_x$ (x is a mountain . x is golden)

is false, since I do not believe that the golden mountain really exists.[1] The

[1]The correctness of paraphrases of propositions in which descriptive phrases have primary or secondary occurrence does not depend on whether those phrases are def-

discrepancy can be explained if we consider the difference between Meinong's and Russell's theories. According to Meinong, the that-clause (10) names *Soseinobjektiv*, while its paraphrase (10) names *Seinobjektiv*. According to Russell's theory, all propositions are of the *Sein* type, hence their paraphrases are correct if we assume or believe that the golden mountain really exists. The following *Sein* propositions

(12) A golden mountain exists;
(13) I believe that a golden mountain exists;

can be correctly rendered by

(14) $\bigvee_x$ (x is golden . x is a mountain);
(15) I believe that $\bigvee_x$ (x is golden . x is a mountain).

The propositions (12) and (14) are false, while (13) and (15) will be true if I am in error. Let's keep in mind that, according to Meinong, judgments and assumptions have the same objective; the difference lies in the absence of an existential opinion in the case of assumptions.

The above interpretation of Meinong's theory leads to the following conclusion. His view is that the propositions that include non-denoting phrases are meaningful because they name their objectives. The objectives subsist when the that-clause is about a really existing object as well as when the subject of the that-clause is an empty name. Meinong's approach has the merit of having a wide scope of application. It secures the meaningfulness of not only the subject-predicate propositions, but also the propositions that state relations. For example, the proposition "Athena is a daughter of Zeus" is true although the names "Athena" and "Zeus" are empty; the proposition names its *Soseinsobjektiv* that Athena is a daughter of Zeus.

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inite or indefinite descriptions. In the above paraphrases the expression "a golden mountain" is an indefinite description. If we use a definite description, "the golden mountain," the respective propositions can be paraphrased as follows:
(8a) The golden mountain is golden
(10a) I believe that the golden mountain is
have the following paraphrases:
(9a) $\bigvee_x$ [(x is a mountain . x is golden . $\bigwedge_y$ (y is a mountain . y is golden → x=y)];
(11a) I believe that $\bigvee_x$ [(x is a mountain . x is golden . $\bigwedge_y$ (y is a mountain . y is golden → x=y)].

Leonard Linsky discusses this matter in "Reference and Referents" (Linsky 1963).

Let's keep in mind that the idea of intentionality of cognitive acts is fundamental to Meinong's theory. If a cognitive act is expressed in a proposition that includes empty names, as is common in ordinary language, then the intentional object cannot be found among the referents of such names. The intentional object is identical with the objective the proposition names, hence Meinong's semantics links meaningfulness of propositions with naming. The existence of an abstract object a proposition names is the necessary and sufficient condition of the proposition's meaningfulness.

* * *

An analysis of the intentional theory of judgment cannot avoid the question of what we mean by the object of thought. It has been pointed out that objects of thought may be interpreted as what we think or what we think about (Prior 1971). If we say that the square circle is square, we certainly think of the square circle rather than about the objective that the square circle is square. According to Meinong, we think of the pure object and remain unconcerned with the question of its existence. The objective, on the other hand, is what we think; in other words, it is the contents of the proposition that names the objective. The above interpretation of the objective as the meaning of the proposition has further support in Meinong's view that the objectives have logical values. When we state that the antipodes exist, we ascribe a logical value to the objective rather than to the antipodes. Truth is ascribed to propositions only indirectly: propositions are true if they name true objectives. What we think about can be understood as an empirical object, or a subsisting object, or else a pure object. What we think, however, always is an abstract object that subsists; it is the contents of a proposition that should not be confused either with a psychic act of thinking or a proposition in the sense of the linguistic articulation of a thought.

The assumption that objectives are identical with propositions, if correct, leads to the conclusion that the same object, namely the objective, is named by the proposition and also constitutes its meaning. Rudolf Carnap develops an argument of that kind in his *Introduction to Semantics*. He uses the concept of designation in a broad sense: designata include not only individual names but also functors and sentences. Carnap refers to Meinong's theory to explain what he means by the proposition and he maintains that propositions are designated by sentences (Carnap 1961: 49-55, 235-236).

Meinong's concept of the proposition gives rise to the question of whether propositions are facts. The concept of fact, important as it is in philosophy and semantics, remains unclear and controversial, and in what

follows we will use the concept of fact introduced by Carnap in his work *Meaning and Necessity*. Carnap maintains that the intension of a declarative sentence is the proposition the sentence expresses, and then he explicates the concept of fact in terms of special type of propositions, namely, the propositions that are true and have empirical contents (F-true, or factually true propositions). In order to avoid the difficulties the negative facts present, Carnap interprets F-false propositions as complex structures. An F-false proposition is not exemplified as a whole, but its components are. ("To be exemplified" means to have a correlate in reality.) For example, the sentence "Walter Scott is human and is non-human" expresses the proposition whose components are the empty property "human and non-human" and the individual concept "Walter Scott." The empty property "human and non-human" can be analyzed in the same manner: it is expressed by the complex predicate whose simple components are exemplified in reality (Carnap 1964: 23-31).

It is worth noting that, according to Carnap, only the simple components of a proposition must be exemplified; according to Meinong, however, complex components of a proposition are exemplified as well. Carnap treats the expression "golden mountain" as a complex predicate whose simple components, i.e., simple predicates, are exemplified by the properties "golden" and "mountain." According to Meinong, on the other hand, the expression "golden mountain" is exemplified by a subsisting object. If we decide to apply the concept of exemplification to Meinong's theory, we will have to modify it considerably, since we will have to go beyond the empirical reality and accept exemplification by what subsists.

In Carnap's view, true empirical propositions are exemplified by facts. For example, the sentence that my table is black expresses the proposition that my table has the property in question; the proposition, in turn, is exemplified by the relevant fact (Carnap 1964: 26). The F-false, analytic, and contradictory propositions are not exemplified as a whole, but only their simple components are. On the other hand, not only F-true propositions are exemplified by facts as a whole, but their simple components are exemplified as well. Carnap entertains a possible theory that there is a single fact that constitutes the whole of the real world and is expressed by the conjunction of all F-true propositions.

In Meinong's theory, both true and false sentences express propositions because of the intentionality of judgments that in both cases are directed to objects. The objective that Mount Everest is the highest summit of the Himalayas subsists, and so does the objective that Mount Everest is the

highest summit of the Alps. Some propositions, namely F-true propositions, could be identified with facts provided we regard facts as objects that subsist along with the empirical things the proposition is about. For example, the subsistence of the objective that the antipodes exists is distinct from the real existence of the antipodes themselves. It is worth noting that Meinong attributes a mode of being to possible objects, such as the golden mountain, hence the objective that the golden mountain is gold subsists along with the subsisting golden mountain. In his theory, the sentence that the golden mountain is golden expresses the proposition that the subsisting golden mountain has the property of being golden, hence the objective named by the proposition can be identified with a fact that belongs to the realm of subsistence.

The above interpretation of Meinong's theory is questionable because it deviates from the ordinary meaning of fact. Carnap's approach stays closer to the ordinary linguistic usage because he identifies true propositions, not false ones, with facts. At this point the question arises: What is a fact? Since Meinong does not address this question, I attempted to interpret his theory using Carnap's concept of fact. My attempt turns out to be unsatisfactory because both true and false propositions are exemplified by facts. The sense of truth, which Meinong ascribes to objectives, appears to be a simple and unanalyzable concept. We find a similar idea in G. E. More's work *Some Main Problems of Philosophy.* If our judgment is true, the intentional object of the judgment subsists and has the simple and analyzable property of being true. Russell expresses this idea in his well-known statement: "Some propositions are true and some are false just as some roses are red and some white" (Russell 1973: 75).

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The semantic aspects of Meinong's theory of objects discussed in this paper have considerable implications for the intentional theory of judgment. If we claim that directedness to an object is distinctive of judgment, then, as a matter of semantic consequence, we have to seek the object correlated to the proposition expressing the judgment. In this way the meaningfulness of propositions expressing judgments is linked to the concept of reference. Meinong does not look for the object correlated to the proposition among the objects that the proposition is about, i.e., among the objects designated by the nominal phrases the proposition contains, since in ordinary language such phrases may be empty names. What Meinong does is to postulate the existence of an abstract object named by the proposition itself. As I argued,

that object plays a double role: the proposition names it and expresses it. In other words, the object is a designatum as well as an intension.

Finally, my discussion of Meinong's theory cannot escape some negative conclusions. His basic idea is that the objects of knowledge, that is, what we talk about, often do not exist, but a semantics that would accommodate this idea presents serious difficulties. It becomes necessary to introduce the distinction between existence and subsistence. This distinction is not only ontologically troublesome; from the semantic perspective, it frustrates attempts at a satisfactory explication of the concept of fact. Moreover, Meinong's theory introduces the concept of pure fact for which no semantic explication seems feasible.

Bibliography

1. Carnap, Rudolf (1961) *Introduction to Semantics*. Cambridge, MA: Harvard University Press.

2. Carnap, Rudolf (1964) *Meaning and Necessity*. Chicago: University of Chicago Press.

3. Linsky, Leonard (1963) "Reference and Referents." In *Philosophy of Ordinary Language*, Charles E. Caton (ed.). Urbana, Il: University of Illinois Press.

4. Meinong, Alexius (1983) *On Assumptions*. Berkeley: University of California Press.

5. Meinong, Alexius (1960) "The Theory of Objects." In *Realism and the Background of Phenomenology*, Roderick Chisholm (ed.). Glencoe, IL: Free Press.

6. Moore, George Edward (1953) *Some Main Problems of Philosophy*. London: Allen and Unwin.

7. Prior, Anthony (1971) *The Objects of Thought*. Oxford: Oxford University Press.

8. Quine, Willard Van (1956) "Quantifiers and Propositional Attitudes." *The Journal of Philosophy* 53: 177-187.

9. Russell, Bertrand (1905) "On Denoting." *Mind* 14: 479-493.

10. Russell, Bertrand (1937) *Principles of Mathematics*. 2^{nd} ed. New York: Norton.

11. Russell, Bertrand (1973) "Meinong's Theory of Complexes and Assumptions." In *Essays in Analysis*, Douglas Lackey (ed.). New York: Braziller.

12. Russell, Bertrand (2009) *The Philosophy of Logical Atomism*. London: Routledge.

13. Ryle, Gilbert (1931-32) "Systematically Misleading Expressions." *Proceedings of the Aristotelian Society* 32: 139-170.

14. Woodruff, Peter W. (1970) "Logic and Truth-value Gaps." In *Philosophical Problems in Logic*, Karel Lambert (ed.). Dordrecht: Reidel.

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THE FORMAL AND SEMANTIC STRUCTURE OF MORPHOLOGICALLY SEPARABLE NOUNS[1]

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0. Today, the claim originated by F. de Saussure that language is a particular device for conveying information is a truism. The basic problem resulting from such an understanding of language is determining principles on which particular information (a particular conceptual structure) is assigned with a given meaning which carries the information (a given phonetic representation) by language.

For F. de Saussure language is a system of signs and sign is a two-sided element, composed of mutually inseparable parts: the concept and its phonetic representation. Thus, language can be treated as a set of elementary signs and grammar, i.e. a set of rules combining elementary signs in complex meaningful units. Soon, however, it became clear that the relations between the conceptual (semantic) area of language and the formal (phonetic) area are of a more complex nature (Karcevskij 1929).[2] To enumerate just the simplest

[1]The present article is an extended and modified version of the paper delivered for a scientific conference organized in December 1971 in Zawoja near Krakow by the Department of Grammatical Structure of the contemporary Polish Language (the Institute of the Polish Language of the Institute of Literary Research of the Polish Academy of Sciences). I would like to thank Irena Bellert (docent, PhD), Andrzej Bogusławski (docent, PhD), Renata Grzegorczykowa (PhD), Stanisław Karolak (PhD) and Janina Puzynina (docent, PhD) for many valuable remarks which enabled me to at least partially eliminate the flaws of the first version of the article. Of course, the flaws of this version are solely mine.

[2]The universal character of lack of unambiguous correspondence between the form and the content of sign is emphasized by Kuryłowicz's (1963: 47).

cases: different contents may have the same linguistic form (homonymy), the same content may be represented by different linguistic forms (synonymy, cases of suppletion, e.g. *rok* "year" — *lata* "years"), a more complex content structure may be represented by a simpler linguistic form (e.g. *wódka* "vodka" is an emotionally neutral word, while *wóda* — is synonymous but has a pejorative meaning). Attempts to rescue the conception of language as a dictionary of elementary signs (morphemes) and a set of rules for combining them resulted in the appearance of such notions as e.g. "a minus morpheme" (Harris 1942 : 171) (which could be illustrated by e.g. *wóda*).

Such difficulties lead to treating the content (semantic) area and the formal (phonetic) area of language as relatively independent in more contemporary linguistic works (Arutiunova 1968). The relation between the two areas is "the enormously complex conventions of correspondence between arrangement of phonological material and meanings" (Hockett 1968: 71). The scientific apparatus of traditional structuralism is not sufficient to describe this key (for linguistics) relation.

1. In the late 1950s a new theory of language emerged called generative grammar (Chomsky 1957). There are a few various generative models of language now (dependency grammar (Hays 1964; Robinson 1970), stratificational grammar (e.g. Lamb 1966), tagmemics (Platt 1971), the model developed by a group of Czech linguists in Prague (Sgall 1968; Sgall, Hajičová 1970), applicative model (Shaumyan, Soboleva 1968)[3]) from which undoubtedly the most elaborate is the model called transformational-generative grammar.[4] Disregarding the significant differences between particular models, their common feature is the fact that the models are formalized and treat the grammar of natural language as a device (an automaton, or more precisely — a series of mutually bound automatons understood in terms of cybernetics) that enables to determine, by means of a finite number of rules, "the infinite set of well-formed sentences and assigns to each of these one or more structural descriptions" (Chomsky 1964: 9).

The so called standard version of transformational-generative grammar, presented by N. Chomsky in *Aspects of the Theory of Syntax*, is a generative model of language that consists of three components: SYNTACTIC, SEMANTIC and PHONOLOGICAL. The syntactic component consists of the BASE and the TRANSFORMATIONAL subcomponent. The base generates, by means of a set of REWRITING RULES of the type $X \rightarrow Y$

[3]And its widely modified version: Shaumyan 1971.

[4]The foundations of the model were presented in Noam Chomsky's (1965) *Aspects of the Theory of Syntax*.

— Z ("rewrite, substitute the string of symbols X with symbols Y — Z"), abstract syntactic schemas which determine grammatical categories of particular sentence elements, as well as grammatical relations that occur between these elements within the sentence. What is obtained after substituting appropriate morphemes ("LEXICAL ENTRIES") for the slots opened by particular grammatical symbols is the notation of the DEEP SYNTACTIC STRUCTURE of a given sentence. Deep structures obtain semantic interpretation and then are decoded, by means of a series of transformational rules, into SURFACE SYNTACTIC STRUCTURES. The latter are structural notations of sentences in which e.g. the indicators of any morphological exponents of syntactic relations in the sentence are present (e.g. indicators of the syntax of agreement). Surface syntactic structures obtain a phonological interpretation.

Thus, within this model, the central place is occupied by the syntactic component which links particular semantic structures with their phonetic representations (links information with meaning) by means of a set of rules.

2. A series of newer approaches that originate from transformational-generative grammar assume semantics and not syntax as a starting point in language description. Syntactic rewriting of rules are substituted with rules that are the extended predicate calculus (Lakoff, Ross 1968; Bach 1968; McCawley 1970b).[5] These rules generate acceptable semantic structures of the utterance, whereas there is a tendency to treat them as universal semantic structures, independent of a given language.

An interesting version of generative grammar is the so called case grammar developed by Charles J. Fillmore (Fillmore 1968). On account of the relation between the argument and the predicate, Fillmore distinguishes a few types of arguments within the sentence (to distinguish the type of this relation he uses the unfortunate, in this context, term "case;" I shall

[5]Lakoff, Ross 1968; Bach 1968; McCawley 1970. A distinct model which deserves consideration here is being developed by Irena Bellert (1972), on the other hand research on the semantics of natural language conveyed by Andrzej Bogusławski and his papers delivered at conferences organized by the Department of Grammatical Structure of the contemporary Polish Language (the Institute of Polish Language of the Institute of Literary Research of the Polish Academy of Sciences); in Zawoja, 1971 — *O treściowych składnikach wypowiedzenia* [On content components of the utterance], in Jadwisin, 1972 — *Nazwy pospolite przedmiotów konkretnych i niektóre właściwości ich form liczbowych i połączeń z liczebnikami w języku polskim* [appellative names of concrete objects and some properties of their numerical forms and their collocations with numerals in the Polish language]. Also, the generative model developed by Czech linguists working at the Charles University in Prague (Sgall 1968; Sgall, Hajičová 1970) take semantics as the starting point.

still use the term "semantic role" to distinguish the type of the relation of the argument and the predicate). In the work referred to here, Fillmore differentiates the role of the agent of the action, the instrument (a tool) of the action or state, a living being (the patient) that receives a given action or state, the result of the action, the object of the action, a place (the location) and a being for whom the action is taken (the list is not to be considered exhaustive). The conception of the semantic roles of arguments, with specific modifications, is also accepted by linguists who work within other generative models of language (Shaumyan 1971; Chafe 1970; Platt 1971).[6]

The case grammar (at least in the version presented in Fillmore's article referred to above) is a mere draft of the particular model of language. A few important problems require further elaboration: especially unclear are the criteria differentiating predicates (here encompassing verbs, while in Fillmore — "traditional" verbs and adjectives) and arguments (here called nominal phrases; for it is known that also "nominal predicate phrases" can occur in the function of the predicate. This model is not fully consistent — it is a compromise between the generative description of language whose starting point is with syntactic structures (the distinction between "verbs" and "nominal phrases", the way of distinguishing the internal structure of nominal phrases) and the description of language whose starting point is with semantic structures (the introduction of different "cases" — semantic roles).

It seems, however, that despite these objections (and others, e.g. treating both verbs *see* and *show* as elementary predicates, in spite of a clearly more complex semantic structure of the latter, which encompasses, among others, the meaning of the verb *see*), Fillmore's model is a valuable tool to analyze the semantic and formal structure of linguistic utterances. However, Fillmorean "deep structures" cannot be treated as basic linguistic structures, but as structures that are results of applying some transformational rules[7] to semantic structures which are more basic and described by means of predicate calculus that is extended on account of special properties of natural

[6]Shaumyan 1971; Chafe 1970; Platt 1971. A similar direction, though inconsistently, is taken by Pieter A. M. Seuren (1969) *Operators and Nucleus: A Contribution to the Theory of Grammar*, Cambridge: Cambridge University Press. The term "semantic role" itself is adopted also here as in Bellert, Saloni (1973); also Bellert 1972: 92-103.

[7]Some of these rules, among others, would cause the segmentalization of complex semantic structures, that is, the clustering of some derived (transformed) semantic structures into syntagmatically inseparable elements of the deep structure of the sentence (into sets of semantic and syntactic features).

language.

In the following paragraphs I attempt to present a description of relations between the semantic and formal (morpheme) structure of certain types of motivated nouns, assuming as a starting point the case grammar though in a detail modified version.

2.1. I assume the following set of semantic roles of arguments (the semantic roles which are insignificant from the point of view of an analysis of derived nouns, which can be, however, distinguished in a more detailed description of the semantic structure of the utterance of natural language, are omitted in this set):

Ag — the agent of the action named by the predicate (usually, a living being, but also a natural phenomenon, a mechanical device, e.g. *The WIND broke the tree*, *The TRACTOR pulls the plough — The HORSE pulls the plough*);

Pt — the carrier of the state, or the object that receives the action caused by the agent, or the object that undergoes a process, e.g. *THIS BIRCH is high*, *JACK sleeps*, *A horse pulls the CART*, *The GRASS grows*;

Exp — the living being that has specific sensuous or intellectual experiences, e.g. *JOHN freezes*, *It seems to JOHN*, *a* CAT *smells a mouse*, *JOHN knows the way*, *JACK remembers about it*, *the teacher teaches CHILDREN*, *MARY likes cats*;

Ben — the being for whom the action is taken, or a being that benefits from the existing state (named by the main predicate of the sentence), e.g. *John gives ME the book*, *A letter to EVE was written*, *The house belongs to YOU*, *JOHN has a pencil*;

Res — the object that is a result of an action or process, e.g. *The HOUSE was built in two years*, *A shoemaker made SHOES*;

Instr — the instrument or the tool that is used to do the action, e.g. *To pound nails with a HAMMER*, *To clean teeth with TOOTHPASTE*, *To ride a HORSE*;

Loc — the place where the action described in the sentence takes place, e.g. *He works in a MINE*, *She walks THROUGH the FOREST*, *It is warmer THERE*;

Temp — the piece of time that defines how long or when the action takes (took) place, e.g. *She read the WHOLE NIGHT*, *They met ONE HOUR AGO*, *It is 3 YEARS OLD*, *It has lasted for 3 YEARS*;

Ob — the neutral object that elaborates on the meaning of the predicate, e.g. *The wagon weights 15 TONS*. I would also include here expressions that occur to the right of the verb (in the surface structure) in sentences

with the so called symmetric predicates of the type *x is similar to y*, *x is the same as y*, *x connects with y*.[8] In my opinion the structure of sentences of this type is: the predicate — the patient — the object.

Probably, even on account of the needs of the description of word-formation facts discussed in this article, the set of semantic roles of arguments proposed here will turn out to be insufficient. However, I hope that as an attempt to apply a specific generative model to describe these facts, the article may have a useful role in the situation when issues of morphology in general, and word-formation in particular are the least analyzed set of issues within generative grammar.[9]

2.2. What can occur as arguments in deep structure are names and descriptions (Reichenbach 1948); what correspond to the latter in the Polish language are nominal phrases, nominal phrases with restrictive relative clauses or motivated nouns (Judycka 1971). In the course of this article I shall discuss descriptions that are represented in the Polish language in surface structure by deverbal and denominal motivated nouns.

Basing on the distinction between the syntactic and semantic derivation introduced by Jerzy Kuryłowicz (1960), there are three types of derivation singled out today: transformation, mutation and modification (Dokulil 1962).[10] Transposition consists in a change of the syntactic function of the lexeme (a shift to a different part of speech, e.g. *biały* "white" — *biel* "whiteness" — *bieleć* "to whiten"), mutation consists in a change of the connotation of the motivated word in relation to the motivating word (e.g. *las* "forest" — *leśnik* "forester," *kawa* "coffee" — *kawiarnia* "coffee house"), modification consists in narrowing the scope of the motivated word in relation to the motivating word (e.g. *dom* "house" — *domek* "small house") or giving the motivated word an emotional overtone (e.g. *nos* "nose" — *nochal* "big nose,

[8]Despite Bellert (1972), and Platt (1971), but in concordance with Fillmore's conception, I assume that in the deep structure an argument with a given semantic role (a given "case") can occur with a given predicate only once. This assumption not only simplifies transformations of appropriate deep structures into surface structures, but (more importantly) remains in concord with the so called theme-rheme distinction. However, the term "symmetric predicates" is justified here as both arguments may change their roles when the perspective of the utterance (the theme-rheme distinction) is changed: *y is similar to x*. However, in the first case, something is asserted about *x* when it is compared to *y*, in the latter case — the other way round.

[9]One of the most eminent representatives of transformational-generative grammar Halle writes: "In spite of its obvious importance morphology [...] has up to the present remained relatively unexplored" (1974).

[10]Also, Heinz, though using a different terminology, introduced the distinction at first for nouns in (1957). And also, independently, Günther, Günther (1960).

conk," *Ewa* "Eve" — *Ewusia*, which is a tender version of the name *Ewa*).

From the point of view of the semantic analysis of natural language presented by Reichenbach (1948), nominal phrases with nouns that are the result of transposition correspond to event arguments (e.g. *catching fish* is an event argument of the sentence *(somebody) catches fish*); nouns that are the result of mutation correspond to descriptions (definite or indefinite — depending on the context use), e.g. *hunter* = somebody who hunts (an object which is the agent of the action *hunts*), *blood-donor* = somebody who donates blood (an object which is the agent of the predicate *donates* and the patient *blood*). Last but not least, it seems that nouns that are the result of modification of the type *domek* correspond to more complex descriptions of the form $(\eta \mathrm{x})\varphi(\psi(x))$: something that is a *small* object which is a *house*.[11]

Using any of the mentioned semantic structures goes beyond word-formation. For an event argument of e.g. *(somebody) catches fish* in specific contexts is also *that (somebody) catches fish*, *to catch fish*; the indefinite descriptions that correspond to the noun *hunter* are e.g. *a person who hunts*, *somebody who hunts*. The descriptions semantically equivalent to the noun *domek* "small house" can be *a house which is small*, and also *a small house*.

Thus, transposition consists in the transformation of a sentence into a nominal phrase, while mutation and modification — univerbization of the structure consisting of a linguistic sign which indicates a class of objects (a living being, person, object, part of space, part of time) and the phrase that assigns a specific property to a given object (e.g. being the agent in relation to *hunt*); the phrase can always be substituted within deep structures by a restrictive relative clause of the type *(somebody) who hunts*.

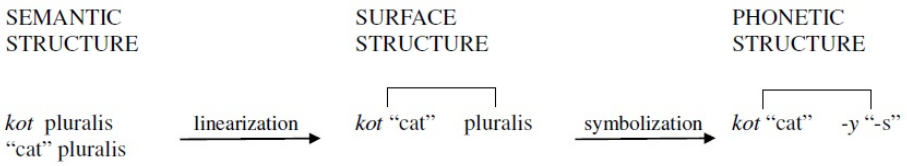
2.3. Before I proceed to the presentation of a specific model of description of the grammar of the word-formation subsystem, I would like to signal three types of approaches to the issue of elementary (so to speak initial) structuralization of content (the structuralization of relations between objects of the world that is the subject of linguistic utterances).

In the standard version of transformational-generative grammar this problem solved through the introduction of: a) "pre-terminal strings" which determine the grammatical categories of elements of the deep structure of the sentence and the syntactic relations between these elements, b) "lexical entries" (substituted for the slots opened by particular categorical symbols of the pre-terminal string) which consist of a set of syntactic features that

[11] An analysis of semantic structure of e.g. hypocoristic expressions of the type *kawusia* — which is a tender version of *kawa* "coffee," etc. would be more complicated, for it would involve introducing pragmatic operators.

determine the collocations of each lexical entry with other elements of the type; each such set of syntactic features is assigned with a specific phonological representation. Thus the notation of the deep structure of the sentence consists of a string of linearly ordered elements whose mutual relations are determined by the so called "derivational tree" or "bracket notation." Part of these elements (lexical morphemes) has specific phonological representations assigned already in deep structure, while part (grammatical formatives) has phonological representation assigned in further stages of generating the sentence.

What is the starting point in the model of generative semantics of Chafe (1970)[12] are complex semantic structures which undergo linearization (that is, the elements become ordered linearly), and only linear strings of elements undergo symbolization (that is, have their phonological representation assigned). For example:



However, James D. McCawley's (1970a) hypothesis seems to be the most attractive. It takes the description of semantic structures and applies the extended predicate calculus as the starting point. Besides the ordinary type of transformations, McCawley also has PRELEXICAL TRANSFORMATIONS, and one of their effects is "to group semantic elements together into word-sized units" (1970a: 291). Such an approach to the problem allows us to explain cases when semantic structures that are identical (or of the same degree) are sometimes expressed by means of morphologically-simple unmotivated words, sometimes by means of morphologically-complex words, and sometimes by means of word phrases (cf. *łania* "hind" — *samica jelenia* "the female of deer," *gołębica* "a female pigeon" — *samica gołębia* "the female of pigeon").

In the course of this article I shall adopt McCawley's hypothesis and assume that the lexical elements that occur in the notations of deep structures proposed here (the elements that represent lexical categories which appear in the notations of the internal structure of arguments) are admittedly

[12] A similar approach can be found in e.g. Postal (1970).

the effect of specific prelexical transformations, however, on a given level of the notation of syntactic-semantic structure they constitute elementary (inseparable) units.

3. I treat the model by means of which I would like to describe certain types of relations that exist in the word-formation system as part of a model of the grammar of the Polish language. However, I focus here on selected issues of word-formation.

A generative model of language would consist of a set of grammatical rules and a dictionary (however, see 2.3. above). Both the set of grammatical rules and the dictionary would have a complex structure.

3.1. In the proposed approach the set of rules would consist of four components — subsets of rules which would be included one by one in the course of generating a given linguistic utterance. The first subset of rules determines the types of deep structures (syntactic-semantic structures) possible in the language; the remaining ones would function as translators that translate structural notations of utterances, which were generated by the previous component, into structural notations of a new type. The output strings of a given subset of rules i are at the same time input strings for the next subset of rules $i + 1$ ($1 \leqslant i \geqslant 3$).[13]

I. The syntactic-semantic component, which is presented here in a simplified version, transforms the distinguished initial symbol Σ (= the utterance + the attitude of the speaker to the utterance content) into strings of symbols that determine types of syntactic-semantic structures possible in the language. This component needs to include e.g. rules:

(G 1) $\Sigma \rightarrow M\ S$[14]

where M — the indicator of the speaker's attitude to the content expressed in S; S — the utterance (without the indicators of the speaker's attitude to the utterance content); in the course of the article I shall use the term SENTENCE to distinguish S.

The structure of the sentence (understood as above) is determined by the rules of the type:

(G 2a) $S \rightarrow P_i N_{Ag}$ (e.g. *somebody comes*)

[13]The terms "input," "output," "input string," "output string" used here are understood in accordance with the meanings assigned to them in cybernetics.

[14]This and the following generative rules of the type, in accordance with the notation adopted in linguistic works, stand for a relation between a main category (the symbol to the left of the arrow) and categories directly subordinate to the main category (the string of symbols to the right of the arrow). A rule of the type $X \rightarrow A\ B$ can be read as follows: "rewrite symbol X as the string of symbols $A\ B$" or "substitute category X with category A and category B."

(G 2b) $S \rightarrow P_j N_{Exp}$ (e.g. *John freezes*)
(G 2c) $S \rightarrow P_k\ N_{Ag}\ N_{Pt}$ (e.g. *a boy chops the wood)*
(G 2d) $S \rightarrow P_l\ N_{Exp}\ N_{Pt}$ (e.g. *a cat smells a mouse*)

(the symbols used are: P — the predicate, N — the argument; the subscript next to P indicates a type of the predicate — see below, the subscript next to N indicates the semantic role of the argument).

Possible types of sentence structure depend on: a) the number of obligatory and facultative arguments that occur with a given predicate, b) what semantic roles of arguments are required by a given predicate. For example, a predicate expressed in surface structure by means of the verb *bić* "to hit" obligatorily requires N_{Ag}, N_{Pt} (each of these arguments may not occur, in specific conditions, in surface structure — then the agent or the patient of the activity is indefinite) and facultatively N_{Instr} (and alternatively other arguments). The predicate represented by *mieć* "to have, posses" obligatorily requires N_{Ben} and N_{Pt}, etc.[15]

It is worth noticing here that the (obligatory and facultative) occurrence of an argument with a specific semantic role together with a given predicate is always equivalent to establishing a set which needs to contain the object whose name occurs as the argument:[16] what can substitute N_{Exp} is only a name of a living being; N_{Instr} — a name of an inanimate object (concrete object or substance); N_{Loc}— a name of part of space. Thus, even in the sentence *John hit Jack with something*, the pronoun *something* is an idefinite description: (ηx) inanimate object (x).

Returning to the possible types of sentence structures: types of sentence structures possible in a given language depend on the classes of predicates which occur in the language and which are distinguished on the basis of the above mentioned criteria. The number of rules of type (G 2) correspond to the number of classes of predicates.

Component I also needs to determine the internal structure of predicates and arguments. It is known that in different context uses the same expressions can occur either as predicates or as arguments (Pelc 1971). In the work repeatedly referred to here, Bellert shows that what can occur in the function of argument in the sentence are only the phrases that are bound with a quantifier (Bellert 1972: 40; Sampson 1969).

[15]See an attempt to classify Polish verbs from a similar point of view in Irena Bellert (1972, appendix); for English verbs appropriate information can be found in Platt (1971); cf. also Fillmore (1968), Chafe (1970).

[16]The necessity to highlight this fact is due to Stanisław Karolak whom I would like to thank here.

In the course of this article I shall ignore the problem of internal structure of the predicate, in order to determine the basic types of arguments. Because in concrete utterances, motivated nouns may occur either as definite or indefinite descriptions (that name either individual objects or sets). I shall not deal with the problem of quantifiers that bind arguments. The rules that determine the basic types of syntactic structure of arguments can be presented as follows:

(G 3)

$$N_x \rightarrow \begin{cases} \text{a) } Npr_X \\ \text{b) } [Nom'\ S'\ ]_X \\ \text{c) } S_X \end{cases}$$

where x stands for a type of the semantic role of the argument;

Npr — an individual name (a proper name in its primary function, personal pronoun, demonstrative pronouns in a deictic function)[17].

Nom — a general name, e.g. *person*, *child*, but also the so called indefinite pronoun that occurs as an indefinite description (cf. above).

S_X — an event argument that occurs in the sentence in the semantic role X.

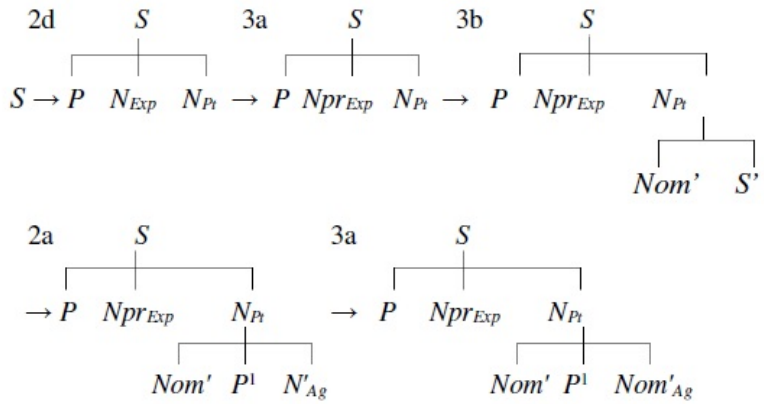
The sign *'* next to symbols S and *Nom* in (G 3b) signal that one (or the only) argument that occurs in this context of S is co-referential with appropriate *Nom'*. Joining symbols [*Nom' S'*] here is a syntactic notation that corresponds to a description (more precisely — to an expression which together with a quantifier omitted in the notation is a description). This joining is only a concatenation of two symbols which is a convenient starting point for a model that generates the surface structures which are represented e.g. by motivated (non-action nouns) nouns. The presence of symbol S to the right of rule (G 3) allows us to apply rules (G 2-3) cyclically, which results in the possibility to generate an unlimited number of types of syntactic-semantic structures.

For example, the following string of rules is possible:

[17]Thus, not in the expression e.g. *ten, kogo wczoraj spotkałem* "this/ the one (masculine, singular) whom I met yesterday," where the definite pronoun is equivalent to operator *j*.

$$S \xrightarrow{2d} PN_{Exp}N_{Pt} \xrightarrow{3a} PNpr_{Exp}N_{Pt} \xrightarrow{3b} PNpr_{Exp}[Nom'S']_{Pt} \xrightarrow{2a} PNpr_{Exp}[Nom'P^{1}N'_{Ag}]_{Pt} \xrightarrow{3a} PNpr_{Exp}[Nom'P^{1}Nom'_{Ag}]_{Pt}$$

or in the for of "trees":



The syntactic-semantic structure which is the final result of the above string of rules can be realized by the following expressions:

John sees { a person / somebody } { who swims / who rides / a swimmer / a rider }

II. The transformational component translates (transforms) deep structures (syntactic-semantic structures) into surface structures. In surface structures, particular elements of the string that constitutes the surface structure of a given utterance are still devoid of phonological representation — they are only sets of syntactic and semantic features that are realized by applying lexical rules as morphemes.

In the course of this article I shall further discuss some transformational

rules by means of which surface structures that correspond to motivated nouns directly through the so called mutation are generated (see 2.2.).

III. The lexical component assigns the symbols generated by the transformational component, through sets of rules, with phonological representation which corresponds to a given symbol in the dictionary. The symbol occurs in surface structure in a specific context. In the so called standard version of transformational-generative grammar, lexical morphemes have already obtained a phonological interpretation in the base, that is — before applying transformational rules and before a semantic interpretation of given deep structures, while symbols that represent grammatical functions obtain a phonological interpretation only through applying the so called readjustment rules (Chomsky, Halle 1968).

However, a model in which phonological representation is assigned to all morphemes only after applying transformational rules seems to be simpler. For, on the one hand, the phonological shape of a morpheme in no way influences transformations of the structures that contain a given morpheme, on the other hand, a series of morphemes, both word-formation morphemes and inflectional endings as well as whole words, occur in surface structure as a result of specific transformations. It is, however, apparent that in a lexical component of generative grammar that was distinguished in such a way, the first to obtain a phonological interpretation are morphemes, which are here conventionally called lexical (their phonological form depends only on the semantic context), then word-formation morphemes (the choice of phonological representation depends on the word-formation base), and only then — inflectional endings, which are word-boundary morphemes (the choice of which depends e.g. on the phonological structure of the inflectional stem of a given word, no matter if the stem consists of only a lexical morpheme, or also of a series of suffixes).

Phonological representation, which is assigned to particular elements of surface structures that were generated by the transformational component, is the so called "ideal representation" that does not take into account the influence of context on the phonological structure of a given string (Bloomfield 1933).

IV. Phonological component: a) introduces the ultimate linear ordering of the string of elements that constitutes the meaning of a given utterance; it is here that boundaries of words and accents are established, b) introduces context-conditioned changes in the phonological structure of a string, it predicts the rule that deletes *l* in between consonants e.g. in the word *jabłko* "apple" which is pronounced as *japko*.

3.2. The dictionary is a repository of elementary linguistic signs. It consists of:

I. The dictionary of lexical morphemes — each lexical morpheme is represented in the dictionary by a set of syntactic, semantic and morphological features as well as phonological representation or a set of phonological representations (in the case of suppletive forms e.g. *be* — *am*). Among morphological features of some morphemes there needs to be information, for example, that the morpheme contains elements of foreign origin; this may affect the applicability of some phonological rules to a given morpheme; e.g. the change of *t* into *c* is typical of all words of foreign origin, cf. *arystokrata* "aristocrat" — *arystokracja* "aristocracy."

II. The dictionary of word-formation morphemes. It seems that this part of the dictionary is organized as either a) or b):

a) the word-formation morpheme is defined similarly to the lexical morpheme, but differs from it in the number of context-conditioned phonological representations (Wurzel 1970). This approach assumes an unbelievably extended homonymy and synonymy of word-formation morphemes.

b) A description of semantic and syntactic properties of particular word-formation morphemes consists in reconstructing the set of unchangeable functional features of a given element. A basis for establishing such sets of distinctive functional features is an analysis of functional oppositions in a given word-formation subsystem, e.g. in the subsystem of nominal word-formation formants.[18] The set of unchangeable functional features that belong to a given word-formation morpheme can be more or less numerous, the set can even be empty, while the scope of usage of a given morpheme is inversely proportional to the number of the morpheme's invariant functional features.[19]

III. The dictionary of inflectional morphemes, which assigns particular grammemes, that is sets of grammatical functions which constitute the content of an individual morpheme, with "ideal" phonological representations.

4. Some types of deep structures that correspond to deverbal and denominal motivated nouns.

4.1. What are the bases of all nouns that were motivated through mutation, that is nouns whose formants are, in Adam Heinz's terminology, in the function of the subject, are deep structures of the type [*Nom' S'*]

[18]The starting point of such an analysis can be the analysis of morphological functional oppositions introduced by Jakobson (1936).

[19]An attempt to implement such an analysis (though with different methodological assumptions) can be found in Laskowski (1971: 138-147).

which can be interpreted as expressions composed of a name (but not a name that designates only one object) and a distinguishing sentence. Applying appropriate generative rules of component *I*, these structures can be extended into strings of the type: $[Nom'\ P\ Nom'_X(\mathrm{Nom}\binom{1}{y}...)]$.[20]

Structures of this type can be transformed by means of transformational rules into constructions composed of a noun or a definite pronoun and a restrictive relative clause, into nominal phrases of different types that do not have a restrictive clause in surface structure, or into derived nouns. The transformations which cause that a motivated noun appears in the surface structure instead of deep structure of the above type, I shall call UNIVERBIZATION TRANSFORMATIONS. In the further course of the article, I shall focus only on some simple univerbization transformations.

What is introduced to the structural notation of utterance, as a result of any univerbization transformations, instead of the element *Nom'* that occurs in deep structure and its coreferential Nom'_X that occurs as an argument of the distinguishing sentence, is a complex symbol, which is treated as an elementary component of the string obtained from the transformation, and which is a set of syntactic-semantic features: $\begin{bmatrix} +Der \\ +X \end{bmatrix}$, where the semantic feature $[+Der]$ indicates that a given element is represented in surface structure by a word-formation affix, while the semantic feature $[+X]$ ($X = Ag$, *Pt*, *Exp*, *Ben*, *Res*, *Instr*, *Loc*, *Temp* or *Ob* — cf. 2.1.) shows the semantic role of a component of the deep structure *S'* that is the base of the structural notation that was obtained through univerbization transformation. The above elementary transformation can be presented in the form:

$$Nom' \ldots Nom'X \rightarrow + \begin{bmatrix} +Der \\ +X \end{bmatrix}$$

.

The sign + placed before the symbol of derivational morpheme signals that the morpheme appears to the right of the word-formation base in surface structure.[21]

Although univerbization transformations themselves are of a facultative nature (because a given deep structure can be represented by surface structures, e.g. with all components of the string that constitutes the deep structure explicated), the above elementary transformation is obligatory in

[20]Symbols in round brackets stand for facultative elements of the string.

[21]By analogy, the notation for prefixes is of the form $\begin{bmatrix} +Der \\ +X \end{bmatrix} +$.

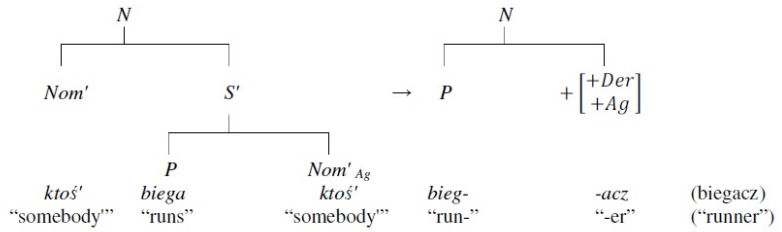
the case of applying a univerbization transformation, and does not depend on the structure of sentence *S'* that occurs in the transformed deep structure. The remaining elements (except for Nom'_X) of deep structure of the distinguishing sentence (P, $Nom\binom{1}{y}$, $Nom\binom{2}{z}$...) are represented either by a morpheme(s) of word-formation base, or part of them is deleted from the string and thus not represented directly by a component of surface structure; alternatively, this part can be represented in this structure by elements of the nominal phrase whose head is a derived noun.

4.2. The simplest case is the one of univerbization transformations of deep structures of a one-argument distinguishing sentence. The function of word-formation base in a derivative, which is a result of univerbization of such a deep structure, is fulfilled here by a morpheme that represents the predicate.

Here, the transformation is of the form:

(T 1) $$Nom' P\ Nom_X \rightarrow P + \begin{bmatrix} +Der \\ +X \end{bmatrix}.$$

For example:



4.3. A few possibilities emerge in the case of univerbization of deep structures of two- (and more) argument distinguishing sentences:

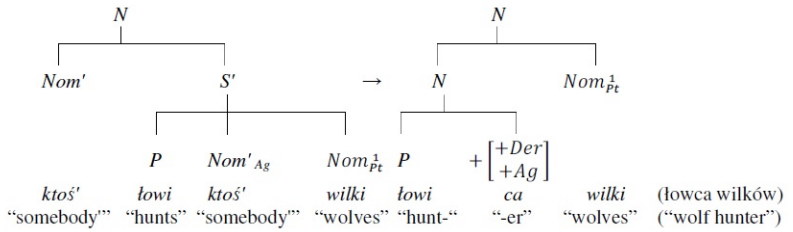
a) what undergoes univerbization is the PART of deep structure that consists of $Nom'\ P\ Nom'_X$according to the principle given in 4.1., the remaining arguments of *S'* become elements of the nominal phrase that is governed by the noun that was created due to the univerbization of the mentioned part of deep structure. The transformation is of the form (T 2) — cf. below.

If arguments of *S'* other than Nom'_X are not specified (that is, can be represented by indefinite pronouns in the "extended" surface structure that corresponds to a given description), then, in the case of univerbization transformation, these unspecified arguments undergo ellipsis, and the surface structure that represents a given description is externally identical to the structures that are the result of the transformation discussed in 4.1. For example, *łowca* "hunter" (externally identical with *biegacz* "runner" in terms

of structure) has, however, a two-argument predicate and comes from the deep structure that can be explicated e.g. as the expression "somebody who hunts *something* (some objects which are not referred to here)."

$$\text{(T 2)} \quad Nom'P\ Nom_X Nom\binom{1}{y}(\ldots) \rightarrow P + \begin{bmatrix} +Der \\ +X \end{bmatrix} Nom\binom{1}{y}(\ldots).$$

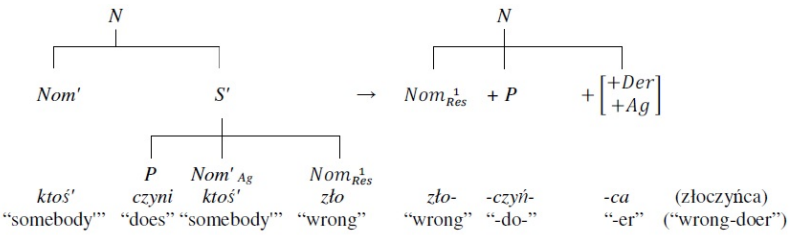
For example:



b) In the case of a two-argument *S'*, the whole deep structure may undergo univerbization, and a complex word, whose word-formation base is composed of P and $Nom\binom{1}{y}$, appears in the surface structure:

$$\text{(T 3)} \quad Nom'P\ Nom'_X Nom\tfrac{1}{y} \rightarrow \binom{a)}{b)} \left\{ \begin{array}{l} P + Nom\frac{1}{y} \\ Nom\frac{1}{y} + P \end{array} \right\} + \begin{bmatrix} +Der \\ +X \end{bmatrix}.$$

For example:



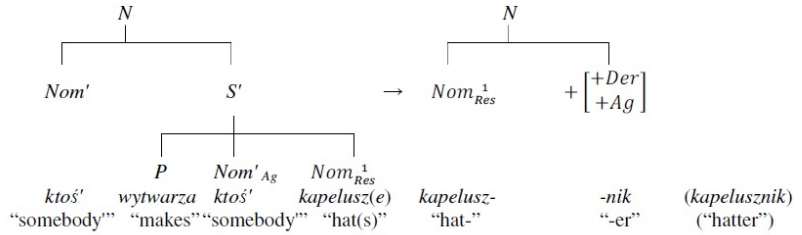
c) at last, in the case of a two- (and more) argument *S'*, P is very often eliminated, while what is represented in surface structure (of the derived noun) in the function of word-formation base is $Nom\binom{1}{y}$ (where $i = 1, 2, \ldots$). The clarity of such word-formations from the point of view of the reader is the most difficult, since they are the most ambiguous, on the other hand, in practice the familiarity with extra-linguistic reality limits the choice of possible semantic interpretations of such structures to two or three, and sometimes it happens that the choice is completely unambiguous. For example, the noun *kapelusznik* "hatter," which structurally has the meaning "somebody who does an activity (has a relation) connected with hats," and thus e.g. *hat lover*, *hat seller*, *owner of a hat*, etc., is usually unambiguously understood as *hat maker* because of the familiarity with the extra-linguistic situation (although, it is always possible to use this formation humorously

in the meaning "somebody who wears a hat").

Transformations that introduce formally denominal nouns that are of interest in this article have the following form:

$$\text{(T4)} \quad Nom'P\ Nom'_X Nom\binom{1}{y} \rightarrow Nom\binom{1}{y} + \begin{bmatrix} +Der \\ +X \end{bmatrix}.$$

For example:



Here again arises the problem of elimination (ellipsis) of arguments of *S'* other than Nom'_y and $Nom\binom{i}{y}$, which is the word-formation base of surface structure of the motivated noun.

It seems that two principles are valid here: 1) ellipsis of unspecified arguments (cf. 4. 2a), e.g. *rybak* "fisherman", is a surface structure of the type $Nom\binom{1}{Pt} + \begin{bmatrix} +Der \\ +X \end{bmatrix}$, which derives from deep structure in which at least one more argument needs to be adopted, that is $Nom'P\ Nom'_{Ag}\ Nom\binom{1}{Pt}\ Nom\binom{2}{Inst}$, and the argument $Nom\binom{2}{Inst}$is not specified (in other words, the deep structure can be explicated as "somebody who catches fish by means of *something*"). 2) Ellipsis of certain components of deep structure occurs obligatorily in the case when an argument of *S'*, which is represented in surface structure as the word-formation base of a derivative, contains the information that is also conveyed by the eliminated elements of deep structure. For example, the noun *wędkarz* "angler" is unambiguous because the word that is its word-formation base *wędka* "fishing rod" contains both — the predicate *łowić* "catch" and the patient of the activity — *ryby* "fish" (*fishing rod* - "a tool for catching fish"). Ellipsis of some arguments (and the predicate) of *S'* here is therefore a sign of linguistic economy.

In a series of cases, however, the rules governing ellipsis of some components (arguments) of *S'* are difficult or even impossible to establish.

4.4. Univerbization rules are applied CYCLICALLY, that is they may be applied to transform structures that are already a result of some univerbization transformations. Hence the possibility of language to have word-formations which contain a number of agglutinative word-formation affixes. It is known, however, that nouns, or motivated words in general, that really

occur in language do not exceed a certain level of complexity. It is not, however, a result of the structure of the grammatical system, but a reflection of specific extra-systematic restrictions that are caused by practical reasons.

The principle of cyclic application of transformational rules requires the rules to be applied starting from the simplest linguistic structures (or to use the terminology of transformational-generative grammar — the most deeply embedded). An example of a slightly more complicated word-formation structure that requires applying univerbization rules in two cycles is e.g. *wędliniarz* "lunch meat maker" whose deep structure can be represented in a simplified form as:

$$Nom'P\ Nom'_{Ag}[Nom^1P^1Nom\binom{2}{Ag}Nom\binom{1}{Res}]_{Res},$$

where $Nom\binom{2}{Ag}$is an unspecified argument. Applying univerbization transformations cyclically — first to the string in square brackets, and then to the whole string, results in:

Cycle 1

$$Nom'P\ Nom'_{Ag}[Nom^1P^1Nom\binom{2}{Ag}Nom\binom{1}{Res}]_{Res} \overset{T4}{\rightarrow} Nom'P\ Nom'_{Ag}[P^1+\begin{bmatrix}+Der\\+Res\end{bmatrix}]_{Res}$$

Cycle 2

$$\overset{T4}{\rightarrow} [P^1+\begin{bmatrix}+Der\\+Res\end{bmatrix}]_{Res}+\begin{bmatrix}+Der\\+Ag\end{bmatrix}$$

where P^1 is represented by the root of the verb *wędzić* "to smoke (meat)," $+\begin{bmatrix}+Der\\+Res\end{bmatrix}$ by the suffix —*lin*(*a*), while $+\begin{bmatrix}+Der\\+Ag\end{bmatrix}$ by the suffix —*arz*(Ø); the element P that occurs in deep structure of this word can be interpreted as *wytwarzać* "to make, produce."

5. Finally, I would like to provide interpretations of various types of deverbal and denominal motivated nouns (however, the examples are rather simple) from the point of view of the model proposed here.

5.1. Transformations of the type (T 1) can be realized by the following detailed transformations:

(T 1a) $\quad Nom'P\ Nom'_{Ag} \rightarrow P+\begin{bmatrix}+Der\\+Ag\end{bmatrix}$

generates deverbal *nomina agentis* of the type *biegacz* "runner," *jeździec* "rider," *pływak* "swimmer," *wróżka* "fortune-teller," etc.

(T 1b) $\quad Nom'P\ Nom'_{Pt} \rightarrow P+\begin{bmatrix}+Der\\+Ag\end{bmatrix}$

generates e.g. *żyjątko* "small creature," *stojak* "stand," *błyszczka* "spoon bait," *śpioch* "sleepyhead," though the last structure is more complex as it also contains a pragmatic operator that expresses emotional attitude to the so named object.

(T 1c') $Nom'P\ Nom'_{Exp} \rightarrow P + \begin{bmatrix} +Der \\ +Exp \end{bmatrix}$

e.g. (Russian *ljubitel'*), *miłośnik* "lover (of something)," *znawca* "expert." It is worth noting that all these words actually undergo transformations of deep structures with *S'* whose second argument is also unspecified, i.e. $Nom\binom{1}{Pt}$.

(T 1d') $Nom'P\ Nom'_{Ben} \rightarrow P + \begin{bmatrix} +Der \\ +Ben \end{bmatrix}$

e.g. *posiadacz* "owner," *oddawca* "postman, somebody who delivers" (similarly to the previous example, unspecified arguments of *S'* undergo ellipsis here).

Also other deverbal nouns discussed below have deep structures with a two- (or more) argument *S'*, and the arguments are not specified. Although the surface structure of this type of noun is identical with the surface structure of nouns derived from deep structures of a one- argument *S'*, I present them here:

(T 1b') $Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom'_{Pt} \rightarrow P + \begin{bmatrix} +Der \\ +Pt \end{bmatrix}$

(in this example, and the following ones, the symbol enclosed in angle brackets stands for an unspecified argument). Words that have such a structure are: *widok* "view," *dawka* "dose," *przesyłka* "delivery package;"

(T 1e') $Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom'_{Res} \rightarrow P + \begin{bmatrix} +Der \\ +Res \end{bmatrix}$

as in e.g. *wytwór* "artifact, product," *wędlina* "lunch meat;"

(T 1f') $Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom'_{Instr} \rightarrow P + \begin{bmatrix} +Der \\ +Instr \end{bmatrix}$

as in e.g. *pisak* "marker," *liczydło* "abacus," *kołyska* "cradle;"

(T 1g') $Nom'P \left\{ \begin{matrix} \langle N_{Ag} \rangle \\ \langle N_{Pt} \rangle \end{matrix} \right\} Nom'_{Loc} \rightarrow P + \begin{bmatrix} +Der \\ +Loc \end{bmatrix}$

as in e.g. *umywalnia* "bathroom" (deep structure with an unspecified agent), *legowisko* "lair," *sypialnia* "bedroom" (with an unspecified patient in *S'*).

5.2. Because of the number and diversity of nominal phrases of the type *łowca wilków* "wolf hunter," *legowisko psa* "dog's lair," *lep na muchy*

"flypaper," I shall ignore this issue here. However, it is worth noting the possible structural types of some complex nouns by means of a few examples:

(T 3a) $Nom'P\ Nom'_{Ag}Nom\binom{1}{Pt} \rightarrow Nom\binom{1}{Pt} + P + \begin{bmatrix} +Der \\ +Ag \end{bmatrix}$

as in e.g. *krwiodawca* "blood-donor," *mężobójca* "husband-killer," *krętogłów* "wryneck;"

(T 3e) $Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom'_{Res}Nom\binom{2}{Instr} \rightarrow Nom\binom{2}{Instr} + P + \begin{bmatrix} +Der \\ +Res \end{bmatrix}$

as in e.g. *maszynopis* "typescript;"

(T 3f) $Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom'_{Instr}Nom\binom{2}{Pt} \rightarrow Nom\binom{2}{Pt} + P + \begin{bmatrix} +Der \\ +Instr \end{bmatrix}$

as in e.g. *śrubokręt* "screwdriver," *korkociąg* "corkscrew," *wodociąg* "water pipe."

5.3. The most represented are surface structures that are of the form of denominal nouns. But their interpretation is also the most difficult. The basic problem, especially in this word-formation group, is to differentiate between motivated nouns (which can be characterized by means of a set of appropriate grammatical rules, e.g. by means of the model proposed here) and nouns which need to be directly incorporated into the dictionary. This frequently discussed problem would require a separate consideration, however I shall not deal with it because of the limited space of this article.

Denominal nouns that are of interest in this article are (as mentioned above, cf. 4.3.c) the effect of ellipsis of the predicate (and often some arguments) of the distinguishing sentence *S'* which occurs as a component of appropriate deep structures.

Among the denominal nouns of the mutation type that are really attested in Polish linguistic material, the following structural types can be distinguished:

(T 4a) $Nom'P\ Nom'_{Ag}Nom\binom{1}{Pt} \rightarrow Nom\binom{1}{Pt} + \begin{bmatrix} +Der \\ +Ag \end{bmatrix}$

as in e.g. *owczarz* "sheep keeper, shepherd," *gołębiarz* "pigeon fancier," *muzykant* "musician," *elektryk* "electrician," *ptasznik* "birdeater," *szachista* "chess player," *biolog* "biologist," *atomista* "atomist;" *efekciarz* "show-off person," *kawiarz* "coffee maker, somebody who prepares coffee," *kobieciarz* "womanizer" (the semantic structure of the last three examples is more complicated);

(T 4a$_1$) $Nom' P\ Nom'_{Ag} Nom\binom{1}{Res} \rightarrow Nom\binom{1}{Res} + \begin{bmatrix} +Der \\ +Ag \end{bmatrix}$

as in e.g. *koszykarz* "basket maker," *kapelusznik* "hatter," *wędliniarz* "lunch meat maker;"

(T 4a$_2$) $Nom' P\ Nom'_{Ag} Nom\binom{1}{Instr} \rightarrow Nom\binom{1}{Instr} + \begin{bmatrix} +Der \\ +Ag \end{bmatrix}$

as in e.g. *saneczkarz* "sleigh driver," *łyżwiarz* "ice-skater," *traktorzysta* "tractor driver," *pianista* "pianist," *skrzypek* "violinist," *wędkarz* "angler" (the latter has also $Nom\binom{2}{Pt}$ in *S'*);

(T 4a$_3$) $Nom' P\ Nom\binom{1}{Ag} Nom\binom{1}{Loc} \rightarrow Nom\binom{1}{Loc} + \begin{bmatrix} +Der \\ +Ag \end{bmatrix}$

as in e.g. *kasjer* "cashier," *kioskarz* "newsagent," *pacierz* "prayer," *aptekarz* "pharmacist." Also the noun *stoczniowiec* "shipyard worker" has an analogous deep structure, however its "derivational history" is different than in the other words: in the generating process there must have occurred a transformation adjectivizing the argument $Nom\binom{1}{Loc}$.

(T 4b) $Nom' P\ Nom\binom{1}{Ag} Nom'_{Pt} \rightarrow Nom\binom{1}{Ag} + \begin{bmatrix} +Der \\ +Pt \end{bmatrix}$

as in e.g. *cesarstwo* "empire," *królestwo* "kingdom" (both interpreted as "object being ruled"), perhaps also *leśnictwo* "forest district" (interpreted as an area). Other deep structures that contain *Nom' ... Nom'*$_{Pt}$ in *S'* with many arguments usually undergo the adjectivization transformation before univerbization; cf. *ojcowizna* "patrimonium, paternal inheritance," *królewszczyzna* "lands owned by the king, crown land" whose deep structure is $Nom' P\ Nom\binom{1}{Ben} Nom'_{Pt}$, or *śmigłowiec* "helicopter," *motorówka* "motorboat" whose deep structure is $Nom' P\ Nom'_{Pt} Nom\binom{1}{Instr}$.

(T 4d) $Nom' P\ Nom'_{Ben} Nom\binom{1}{Pt} \rightarrow Nom\binom{1}{Pt} + \begin{bmatrix} +Der \\ +Ben \end{bmatrix}$

as in e.g. *młynarz* "miller," *aptekarz* "pharmacist" (interpreted as the owner), *rencista* "pensioner."

(T 4b$_1$) $Nom' P\ Nom'_{Pt} Nom\binom{1}{Loc} \rightarrow Nom\binom{1}{Loc} + \begin{bmatrix} +Der \\ +Pt \end{bmatrix}$

as in e.g. *krakowianin* "citizen of Cracow," *Amerykanin* "American, citizen of America," *Kongijczyk* "citizen of Congo," *Tyrolczyk* "citizen of Tyrol," *góral* "highlander," and other names of citizens as well as names of other objects that derive from the place of origin or residence (e.g. *węgierka* "prune"[22]). In the words *południowiec* "southerner," *bagiennik* "Bagiennik,"

[22]In Polish, the word for prune is *węgierka*, while the word for Hungarian female is

which have an identical deep structure, the univerbization transformation was applied before the adjectivization transformation. Also, the words *naszyjnik* "necklace," *podnóżek* "footstool" derive from the same type of deep structures, however, they seem to result from applying transformation (T $4b_1$) later — not directly to the deep structure, but to the derived structure that already has obligatory exponents of the relation between the arguments and between the arguments and the predicate. For these words have a phonological representation of prepositions *na* "on," *pod* "under," etc.

(T 4f) $\quad Nom'P\ Nom'_{Instr}Nom\binom{1}{Res} \rightarrow Nom\binom{1}{Res} + \begin{bmatrix} +Der \\ +Instr \end{bmatrix}$

as in e.g. *sieczkarnia* "straw cutter." The nouns such as: *ręcznik* "towel," *okiennica* "shutter" have in their deep structure the argument of the function $Nom\binom{1}{Pt}$ instead of $Nom\binom{1}{Res}$; however, what perhaps needs to be assumed in their case is not the direct univerbization of appropriate deep structures but also the adjectivization transformation.

The denominal nouns whose word-formation formant represented in surface structure is Nom_{Loc} are relatively numerous:

(T 4g) $\quad Nom'P\ Nom\binom{1}{Ag}Nom'_{Loc} \rightarrow Nom\binom{1}{Ag} + \begin{bmatrix} +Der \\ +Loc \end{bmatrix}$

as in e.g. *piekarnia* "bakery" (in turn, $Nom\binom{1}{Ag}$ is the result of transformation T 1a');

(T $4g_1$) $\quad Nom'P\ Nom\binom{1}{Pt}Nom'_{Loc} \rightarrow Nom\binom{1}{Pt} + \begin{bmatrix} +Der \\ +Loc \end{bmatrix}$

as in e.g. *kartoflisko* "potato field," *kurnik* "chicken coop," *bacówka* "mountain hut;"

(T $4g'_1$) $\quad Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom\binom{2}{Pt}Nom'_{Loc} \rightarrow Nom\binom{2}{Pt} + \begin{bmatrix} +Der \\ +Loc \end{bmatrix}$

as in e.g. *kawiarnia* "coffee house," *bagażnik* "car boot" (in the proposed model these structures would differ from the previous ones only in that 1) the predicate is an action verb, hence 2) the agent (in this case unspecified) is an obligatory argument of *S'*).

(T $4g'_2$) $\quad Nom'P\ \left\langle Nom\binom{1}{Ag}\right\rangle Nom\binom{2}{Res}Nom'_{Loc} \rightarrow Nom\binom{2}{Res} + \begin{bmatrix} +Der \\ +Loc \end{bmatrix}$

as in e.g. *cegielnia* "brickyard," *cukrownia* "sugar factory."

There are several groups of denominal nouns whose interpretation is difficult, e.g. names derived from the material used such as *sernik* "cheese

Węgierka — trans. note.

cake," *wiśniak* "cherry alcohol," *wełniak* "woolly monkey/ a type of fabric," etc. It seems that such words can be analyzed according to the following rule:

(T 4 h') $Nom'P \left\langle Nom\binom{1}{Ag} \right\rangle Nom'_{Res} Nom\binom{2}{Pt} \rightarrow Nom\binom{2}{Pt} + \begin{bmatrix} +Der \\ +Res \end{bmatrix}$.

More doubtful is an attempt to interpret structures with the predicate "be similar to," "be an element of ...," "be a descendant of ..." as $Nom\binom{1}{Pt}$ $Nom\binom{2}{Ob}$ (such structures occur respectively in *wilczur* "Alsatian," *maślak* "boletus;" and *Izraelita* "Israelite," *Dominikanin* "Dominican monk;" and *królewicz* "prince," *Piastowicz* "descendant of Piast the Wheelwright") as in the case when there is a sentence in the surface structure with all these elements, $Nom\binom{1}{Pt}$ is realized by the grammatical subject (*a dog* is similar to ..., *X* is a descendant of ...). However, if this interpretation were adopted, the motivated nouns mentioned above could be analyzed by means of the transformation:

(T 4b$_2$) $Nom'P\ Nom'_{Pt} Nom\binom{1}{Ob} \rightarrow Nom\binom{1}{Ob} + \begin{bmatrix} +Der \\ +Pt \end{bmatrix}$.[23]

6. The generative model to describe word-formation facts that was presented above is not so much imperfect as incomplete. I believe that after fifteen years of thriving development of the linguistic theory called generative grammar, it is beyond doubt that this type of language description is justified and even necessary if linguistics is to be a set of scientific theorems that can be proved. Also, it is beyond doubt that the method itself needs constant improvement. What is a doubtless shortcoming of the generative analyses of language is focusing on syntactic and morpho-phonological issues, while issues of morphology, and especially of word-formation, are clearly neglected.

In such a situation it seems that even if the model proposed here turns out to be completely unsuccessful, the article may have a useful function of clearing the way for further more successful research on word-formation issues within generative grammar.

Bibliography

1. Arutiunova, Nina D. (1968) "O znachimykh yedinitsakh yazyka." In *Issledovaniya po obshchey teorii grammatiki*, Victoria N. Yartseva (ed.),

[23] In these considerations I ignore word-formations that are clearly emotionally marked, including the type *brodacz* "bearded man," *brzuchacz* "somebody with a big belly," which causes a series of interpretive difficulties.

58-116. Moskva: Nauka.

2. Bach, Emmon (1968) "Nouns and Noun Phrases." In *Universals in Linguistic Theory*, Emmon Bach and Robert T. Harms (eds.), 91-122. New York: Holt, Rinehart and Winston.

3. Bellert, Irena (1972) *On the Logico-Semantic Structure of Utterance*. Wrocław: Ossolineum.

4. Bellert, Irena and Zygmunt Saloni (1973) "On the Description of Lexical Entries for Verbs." *International Journal of Slavic Linguistics and Poetics* 16: 43—58.

5. Bloomfield, Leonard (1933) *Language*. New York: Holt.

6. Chafe, Wallace L. (1970) *Meaning and the Structure of Language*. Chicago-London: The University of Chicago Press.

7. Chomsky, Noam (1957) *Syntactic Structures*. S-Gravenhage: Mouton & Co.

8. Chomsky, Noam (1964) "Current Issues in Linguistic Theory." Papers presented at the Ninth International Congress of Linguistics, Cambridge, Massachusetts, 1962. Janua Linguarum 38. The Hague: Mouton.

9. Chomsky, Noam (1965) *Aspects of the Theory of Syntax*. Cambridge, MA: The M.I.T. Press.

10. Chomsky, Noam and Morris Halle (1968) *The Sound Pattern of English*. New York: Harper & Row.

11. Dokulil, Miloš (1962) *Tvoření slov v češtině*, I. *Teorie odvozování slov*. Praha: Academia.

12. Fillmore, Charles J. (1968) "The Case for Case." In *Universals in Linguistic Theory*, Emmon Bach and Robert T. Harms (eds.), 1-88. New York: Holt, Rinehart and Winston.

13. Günther, Erika and Kurt Günther (1960) "Die Haupttypen der nominalen und verbalen Wortbildung im Russischen." *Zeitschrift für Slawistik* 5: 446-461.

14. Halle, Morris (1974) "Morphology in a Generative Grammar." In *Proceedings of the 11 International Congress of Linguists, Bologna-Florence, Aug. 28 — Sept. 2, 1972*. I-II, Luigi Heilmann (ed.), 695-704. Bologna: Società editrice il Mulino.

15. Harris, Zellig S. (1942) "Morpheme Alternants in Linguistic Analysis." *Language* 18: 169-180.

16. Hays, David (1964) "Dependency Theory: a Formalism and Some Observations." *Language* 40: 511-525.

17. Heinz, Adam (1957) *Funkcja egocentryczna rzeczownika*. Wrocław: Ossolineum.

18. Hockett, Charles F. (1968) *The State of the Art*. The Hague-Paris: Mouton.

19. Jakobson, Roman (1936) "Beitrag zur allgemeinen Kasuslehre, Gesamtbedeutungen der russischen Kasus." *Travaux du Cercle Linguistique de Prague* 6: 240-288.

20. Judycka, Irmina (1971) *Syntaktyczna interpretacja struktur słowotwórczych* (*na przykładach formacji z kategorii nomen loci*). Warszawa: Państwowe Wydawnictwo Naukowe.

21. Karcevskij, Sergej (1929) "Du dualisme asymétrique du signe linguistique." *Travaux du Cercle linguistique de Prague*, 1: 88-93.

22. Kuryłowicz, Jerzy (1960) "Dérivation lexicale et dérivation syntaxique." In *Esquisses linguistiques*, 41-50. Wrocław-Kraków: Polska Akademia Nauk.

23. Kuryłowicz, Jerzy (1963) "Le mécanisme différenciateur de la langue." *Cahiers Ferdinand de Saussure* 20: 47-54.

24. Lakoff, George and John R. Ross (1968) *Is Deep Structure Necessary?* Bloomington: The Indiana University Linguistic Club.

25. Lamb, Sydney M. (1966) "Prolegomena to a Theory of Phonology." *Language* 42: 536-573.

26. Laskowski, Roman (1971) *Derywacja rzeczowników w dialektach laskich*, II. Wrocław: Ossolineum.

27. McCawley, James D. (1970a) "English as a VSO Language." *Language* 46: 286-299.

28. McCawley, James D. (1970b) "Where Do Noun Phrases Come from?" In *Readings in English Transformational Grammar*, Roderick A. Jakobs and Peter S. Rosenbaum (eds.), 166-183 Waltham, Mass.: Ginn and Company.

29. Pelc, Jerzy (1971) *O użyciu wyrażeń*, Wrocław: Ossolineum.

30. Platt, John T. (1971) *Grammatical Form and Grammatical Meaning: a Tagmemic View of Fillmore's Deep Structure Case Concepts*. Amsterdam-London: North Holland Publishing Company.

31. Postal, Paul M. (1970) "On So-called Pronouns in English." In *Readings in English Transformational Grammar*, Roderick A. Jacobs and Peter S. Rosenbaum (eds.), 56-82. Waltham, Mass.: Ginn and Company.

32. Reichenbach, Hans (1948) *Elements of Symbolic Logic*. New York: Macmillan.

33. Robinson, Jane J. (1970) "Dependancy Structures and Transformational Rules." *Language* 46: 259-285.

34. Sampson, Geoffrey (1969) *Noun-Phrase Indexing, Pronouns, and the "Definite Article."* New Haven, Conn.: Linguistic Automation Project, Yale University.

35. Seuren, Pieter A. M. (1969) *Operators and Nucleus: A Contribution to the Theory of Grammar*. Cambridge: Cambridge University Press.

36. Sgall, Petr (et al.) (1968) *A Functional Approach to Syntax*. New York: American Elsevier Publishing Company.

37. Sgall, Petr and Eva Hajičová (1970) "A 'Functional' Generative Description." *The Prague Bulletin of Mathematical Linguistics* 14: 3-38.

38. Shaumyan, Sebastian K. and Polina A. Soboleva (1968) *Osnovaniya porozhdayushxhey grammatiki russkogo yazyka*. Moskva: Nauka.

39. Shaumyan, Sebastian K. (1971) *Filosofske voprosy teoretikheskoy lingvistiki*. Moskva: Nauka.

40. Wurzel, Wolfgang U. (1970) *Studien zur deutschen Lautstruktur. Studia Grammatica* 8. Berlin: Akademie-Verlag.