REISM: ISSUES AND PROSPECTS

Tadeusz KOTARBINSKI

I feel obliged to begin with an explanation of the term "reism", which I introduced in 1929 into my book on gnosiology, logic, and methodology. Although the book, which had its revised second edition in 1961, also appeared in English in 1966 as *Gnosiology, the Scientific Approach to the Theory of Knowledge,* I have no reasons to believe that the term in question is well known to my colleagues philosophers outside Poland. As I know that it has already caused misunderstandings, by being identified with the term "realism", which is completely at variance with my intentions, I have been trying for a couple of years to replace it by the term "concretism", to which I impart the same meaning.

But what that meaning is ? Whom do I intend to call a reist or a concretist ? Here is my reply which I make as concise as possible. He, and only he, is a reist, or concretist, who goes to the utmost in putting into effect the following intention: for every declarative sentence (statement) that includes abstract terms he tries to find an equisignificant statement including no such terms. By abstract terms I mean here all those which are not concrete, and by concrete I mean all, and only those, terms which are names of things. Thus, the name of a thing is a proper name of a single individual that is a thing, for instance "Vesuvius", or a description that has only one designatum, e.g., "the volcano near Naples", or a general term that has more than one designatum, but on the condition that each of them is a thing, e.g., "a stone", "an overcoat", or a term that has no designatum but has such a meaning that its analytic definition could be: «N is such and such a thing"; for instance, the term "Pegasus" could be defined as "Pegasus is a winged horse". I do not hesitate to give this example, since by a thing I mean any physical body, living organisms included (which automatically includes human beings), or a totality consisting of physical

bodies, or any component part of a physical body, or any microphysical particle or any totality consisting of such particles.

Thus it is obvious that reism, or concretism, is a variation of nominalism. The explanations to follow will show in what it differs from its other better known forms. But even now, on the strength of what has been said so far, it can be seen that we have to do here with an ontological approach, and that this approach is physical in nature or, to use a slightly different terminology, materialistic. And perhaps the most pertinent formulation would be to use the term "somatism" in order to bring out the predilection, inherent in reism, i.e., concretism, to single out and to describe bodies: in Greek "soma" means "a (physical) body". I would not feel surprised if some one expressed his astonishment at the fact that a person has come upon the idea of engaging in analyses concerned with a description of reism. In statements and theorems belonging to the various disciplines reference is made incessantly to abstract ideas by means of abstract terms, and people are inclined to believe that this belongs to the very essence of scholarship. Those statements and theorems abound in such terms as property, relation, dependence, point, number, function, etc. Can we do without them without at the same time renouncing the pursuit of scientific activity ? And if so, what induces reasonable people to reformulate statements including abstract terms as equivalent statements devoid of such abstract terms ?

Several fairly weighty arguments can be adduced in favour of such a programme. First of all, it seems almost natural to resort to such a reformulation in those simple cases when a statement comprising an abstract term proves to be a metaphorical paraphrase, which can be comprehended only indirectly, of a directly comprehensible statement free from an abstract term. If we say that "the diamond has the property of extraordinary hardness", does it not mean just that "the diamond is extraordinarily hard" ? We have here successfully eliminated the terms "property" and "hardness". The former has disappeared completely, and the latter has been replaced by the term "hard". But whereas "hardness" is an abstract term, "hard" is a concrete term since it names things: it is certain things, including the

diamonds, that are hard, and not the properties. Likewise, if we have the statement "the goat belongs to the class of horned ruminants", we are right in interpreting it as a learned equivalent of the simpler formulation, devoid of abstract terms, which is "the goat is a horned ruminant". In this way we have smoothly eliminated the abstract term "class". The same term can also be eliminated from the statement "the class of joiners is included in the class of artisans" if we say simply "every joiner is an artisan».

But there is one reason more why we accept the reistic programme, namely the very reflection on the essence of cognition as expressed by declarative sentences (statements). What is human knowledge, if not a continuation of animal knowledge, improved by the use of language ? And does not animal knowledge reduce to responding perceptively to stimuli in forms of things ? We, human beings, also respond perceptively to things, and all our knowledge possibly is nothing else but an intricate structure of fragments of ourselves as beings that respond perceptively to stimuli in the form of things, with the only essential difference in comparison with the animals that in our case the world of the stimuli is accompanied by language signs shaped not only phylogenetically, but mostly historically, by an imitative transmission of language signs that had developed in human communities. But it seems obvious that when we perceive something we always respond to a stimulus in the form of a thing: a thing struck or moved in some way acts on our ears by air waves which result from the fact that the said thing had been struck or moved, and then we hear somehow. It is likewise in other cases, with the difference that it is a vibrating electromagnetic field, and not vibrating air, that is the intermediary between the stimulus, which is the thing perceived, and the eye. Then we see somehow. This applies to all sensory perceptions (introspective perceptions will be discussed later); the simplest case is that of tactile perception, when a stimulus in the form of a thing directly presses the receptor organs of the perceiving individual. From the empirical standpoint adopted here, a standpoint suggested by man's situation in nature and in history, the tentative reduction of all statements to those which do not

include abstract terms becomes a tentative satisfaction of an urge which reaches very far, but is not devoid of rational justification.

Here we have for a moment to consider what has been said above. Now "urge", "reduction", "intention", "cognition", all these are terms which are not names of things, and yet they have been used above. The question arises whether the present author is consistent when he propagates the reistic programme and at te same time uses abstract terms in his statements. The reply is evident: the reistic programme only demands the reducibility of all statements comprising abstract terms to equivalent statements free from such terms, but does not in the least demand that statements with abstract terms be boycotted, for it is obvious that such statements are merely concise replacements for statements free from abstract terms. Avoiding all abstract terms would make our statements very clumsy, lengthy and complicated, and on certain occasions just unbearable. Without statements including abstract terms any expostiion of reism would go on terribly long, and would have to estrange even those who are most friendly to its basic ideas. The positions of statements in this case is like the position of the means of payments in a system based on the gold standard. Every banknote, cheque, and promissory note must be exchangeable into gold on demand, which does not mean that all payments are made in gold. Exactly the inconvenience of such transactions is one of the reasons why banknotes, cheques, promissory notes, and other similar substitutes for gold are in circulation.

As we now revert to the main issue of this paper, feeling free to use abstract terms in discussion of reism, I shall take the liberty to suggest an aphorism that summarizes the essence of that theoretical approach. That aphorism is: "Abstract terms have been made not to state truths about themselves, but only to help state truths about things." To formulate this idea in a more precise manner we shall say: "Abstract terms do not serve to state truths about abstract terms, but only help make abbreviated true statements about things." These formulations comprise a negative and a positive element. The requirement to avoid abstract terms in final statements that need no further

reductions is negative. The requirement that every final statement should include at least one name of a thing is positive. For whenever we assert something, we speak about something, and that latter something always is a thing. But I must admit that so far I have always struggled almost exclusively with the problems resulting from the first, negative, requirement, although the defence of the second, positive, requirement, also forms part of the programme. In taking up the second issue we would have to demonstrate that the counterexamples used do not stand examination. And the counterexamples are not to be treated lightly, since they are provided in large numbers by theorems of the sentential calculus, for instance the theorem stating that $p \rightarrow p$ (if p, then p). I shall revert to this problem, but now, after all these introductions and explanations, it is high time to say how reists try to free statements with abstract terms from such abstract terms in those cases when they believe they can succeed in doing so.

Let us begin with statements about sensory perceptions. "The poppies are of a red colour, while the forget-me-nots are of a blue colour." This is merely an elaborate way of saying much more simply that "the poppies are red, while the forget-me-nots are blue." The abstract term "colour" has been eliminated from the statement, while the predicates "red" and "blue" have stayed; they are names of things, because we can make true statements about certain things by saying that they are red or blue. The same holds for relational terms. "Castor and Pollux were linked by friendship" is just a more literary form of stating that "Castor and Pollux were friends". In the latter formulation the term "friendship" vanishes, and the term "friends" appears, the latter is a concrete term, since it names Castor, Pollux, and other persons friendly to each other, and persons are things. And what about such a statement as "The relation of seniority is transitive" ? Here, for all the appearances, reference is not made to a relation, because the entire statement means the same as: "If a person is older than some other person, and that other person is older than a third person, then the first person is older than the third." Here again the terms "relation" and "seniority" have vanished, and the term "older than" has appeared; the

latter is predicated about persons, when we say that, for instance, John is older than Peter. Likewise, we can do without the abstract terms which are names of states of things, also called by the German term "das Sosein". Consider, for instance, the following compound sentence: "The fact that ice is lighter than water explains why the surfaces of the ponds freeze." Here "the fact that ice is lighter than water" is considered an abstract term which is a name of a state of things, of a "Sosein". But the entire compound sentence merely means the same as another compound sentence, namely "Ice is lighter than water, and since ice is lighter than water, the surfaces of the ponds freeze." We have got rid of "the fact that ...", and the terms that have remained, "ice", "water", "surface", "pond", "lighter than", are names of concrete things. The same applies to terms referring to processes: the sentence "There has been a considerable improvement in the patient's condition" means just the same as "The patient has improved considerably".

These examples are to demonstrate that the reistic elimination of names of properties, relations, states of things, and processes can easily be achieved in many cases drawn from colloquial speech. Emboldened by these achievements the concretists are testing their possibilities in confrontations with doctrines of the various philosophers. And it must be said that their attitude was partly shaped by a systematic opposition to the approach represented by Berkeley. In his system everything is based on statements which allegedly are statements about sense data, termed ideas, whose examples are coloured patches, tunes, tastes, tactile sensations, etc. Now in our polemics with Berkeley we resort to the same operation which was used when reference was made to a hard diamond or a red poppy. From the concretist standpoint Berkeley makes the cardinal error of taking those statements about coloured patches, tunes, tastes, tactile sentations, etc., to be the fundamental statements, as if such alleged objects were the stimuli causing cognitive responses in men. But they are not any stimuli working on our receptors. What Berkeley ascribes to the subjects of the sentences in question, a concretist ascribes to the predicates (or subjective complements). Instead of seeing a lemon as an object consisting of

a yellow colour, a soft tactile quality, and a specific sour taste, a concretist says that he faces a thing which is yellow, soft, and sour. In this way he describes reality without resorting to abstract terms. One illustration more may prove to the point, namely the difference between the various approaches to what happens when a person watches himself in a mirror. In Berkeley's approach the object seen is the image of one's own person consisting of coloured patches, light spots, shades, visually given shapes, etc. In the concretist approach the object seen is the very person who sees himself in the looking-glass. He sees himself somehow as such and such, for instance, as pale or ruddy, bald or curly-haired, etc., and he realizes how he sees himself by using for that purpose predicates that are names of his own body, and not names of his reflection in the mirror.

Many people listen to all this with impatience, ready to show apparently notorious cases of speaking about images. This is believed to happen whenever a person dreams: he sees then, for instance, an image of snow-covered mountains, a mountain landscape which is, as it were, internal, immanent, and when he describes his own dream he speaks about that image, and not about the mountains which he sees neither directly, as when a person faces an object, nor indirectly, as when a person sees himself in a mirror. Now the reist replies that that person sees the mountains also when he dreams. This is as in the case of recollections. When I recollect the mountain I saw yesterday then the same mountain which I saw yesterday is the object which I see, to which I respond visually. It is only that my perceptive response to it is delayed and in some way echo-like, copy-like, reproductive. All this does not arouse any lively protests. Objections are raised, on the contrary, when it comes to imaginary vision, because then no thing is just so as we see it. But this case does not differ essentially from that when we see things in a crooked mirror: we see then things as deformed, and our description of things seen in such a way would be false, if the true description would be that of things seen in a smooth mirror. Nevertheless what we see in a crooked mirror, i.e., that to which we respond as to a stimulus, is a thing, and not its image. Now the same applies to fantastic dreams. We

always see in them some things, which act as stimuli on our receptors. But we see them somehow distorted and how we see them we explain by means of properly selected predicates. Popocatepetl is cone-like, slender, and white, and I dreamt of it as stocky, cap-like, and red. Accordingly, when describing how I dreamt of it I shall refer to it as stocky, cap-like, and red, and I shall refer to that mountain, and not to its image.

Let us now revert to observations, but not to those which are responses to external stimuli. Our experience includes observations which are not extraspective, but introspective, for instance, those of a toothache, itching of our own skin, pressure in the respiratory tract, tension in the muscles, etc. Here, it is said, that of which we speak is content of some experiences, and not any things. But the reist will defend his standpoint here, too. Consider, for instance, a cramp of the calf muscle, which probably everyone knows from his own experience. Now it is that muscle which is the thing observed, the stimulus acting on the receptor system of the person in question. The difference between that muscle and a pinching shoe is that the shoe is outside the body of the person in question, whereas the muscle belongs to his body and acts on proprioceptors (and not exteroceptors), that is receptor fibres that are in contact with a part of the person's own body, and not with an external thing. An adequate formulation of such an observation would be the statement: "The muscle of my left calf is cramped", where the term "cramped" describes that muscle qualitatively in the same way as the term "hard" qualitatively describes an oak board on which a person happened to lie. Hence it is not a quality which is referred to in the observation statements of this kind, but a definite thing — the muscle — which is described qualitatively by an adequate predicate that is concrete and not abstract.

Have we, by settling the issues of the statements supposed to be statements about images and statements about contents of purely internal experiences, thereby demonstrated the method of reistic, concretistic reduction of psychological statements in general ? Not in the least. In our opinion neither a description of the mountains seen in a dream nor a description of parts of our own body, which we characterize qualitatively at the

moment of responding perceptively to them, is a psychological statement, in the same way as the statement of a child which points to a flower on the meadow and exclaims "What a yellow flower, and how green the grass", is not a psychological statement. All these are various perceptive statements about things, which describe those things qualitatively. They might be termed phenomenological if that term had not been used earlier by the phenomenological schools of philosophy for quite different purposes. On the contrary, psychological statements are those about experiencing persons; they inform that those person have experiences. Such statements are commonly treated as statements about a person's experiences. Here are some examples of psychological statements: "John is hungry", "Last night I felt as if I were suffocating", "Peter is ashamed of what he has done", "It seems to John that he is made of glass", "People are inclined to believe in what they find pleasing", etc. Each of these statements has, as it were, two levels and can be decomposed into two parts, the introductory one and the principal one. The former announces about whom something will be stated imitatively (and sometimes it states what channels of a response to a stimulus are involved): thus, it will refer to John, Peter, or some one else, or even just some person, and it will state that the person in question sees, hears, responds to a condition of his own body, recollects somethings, imagines something, etc. The principal part imitatively expresses what the person in question is experiencing. That second part describes a response to a stimulus, or describes the stimulus itself, but no actual response takes place: we have to do with an imitative response only. Here, by way of example, we give a reistic reduction of the psychological statement: "John dreamt of snow-covered moutains". This sentence corresponds to the whole consisting of the introductory sentence: "John in his sleep imagines so" and the principal sentence: "The moutains in front of me are snow-covered". I have to apologize in this connection that I indicate the method of the reistic interpretation of psychological statements in a very general way. The problem is complex, and the suggested solution controversial. Since I have discussed it on several occasions in English-language publica-

tions, I take the liberty to refer here to my *Gnosiology,* pp. 335-53, and in particular pp. 345-9, my article "On Pansomatism", published in *Mind,* No.64, 1955, pp. 488-500, and my article "Psychological Propositions" in *Scientific Psychology,* 1965, pp. 44-9. Few people have as far declared solidarity with what I have written there, but I have not met with any criticism that would defeat the stubbornness with which I stick to my ideas.

But the most important objections to reism are raised in the field of the exact sciences. The physicists usually claim that their numerous theorems refer to particles, and many particles, even if they are parts of physical bodies, that is things, are themselves no physical bodies, and hence no things. If the concretist replies that for him a thing is a physical body or a part of any such body, the physicist refers to what is termed field matter, that is something which fills the barometric vacuum and undulates, although in the barometric vacuum there are no bodies. Hence the concretist must resort to a potentialization and try to define a thing as a physical body or its part or as something that can be part of a body, in doing which he risks the assumption that field matter consists of particles that can become component parts of bodies. But this is not enough. The physicists often say that mass changes into energy, which many people interpret so that from time to time here and there some bodies or their parts vanish, and are replaced by motion, which, obviously, is neither a body nor a part of a body. But the reist tries to interpret this in a different way. He supposes that some bodies or their parts become less massive and somehow specifically more movable, so that the change consists not in a change of the subject that is a name of a thing into a subject that is not a name of a thing, but in a change of predicates (subjective complements) that describe the things in question on one occasion as being more massive, and on another occasion as being more specifically movable.

While he usually has to defend his standpoint, a concretist can also attack. There is no conflict if he does not consider time and space to be things, and the names of places and the names of moments to be names of things, and hence possible subjects of final sentences that are not liable of any reistic reduction.

He is not blamed for this by the physicists. But he feels bound to protest when a physicist claims that a photon is at the same time a particle and a wave. To claim that means to risk a syntactic nonsense, since in ordinary physical descriptions of moving liquids and/or gases the term "wave" does not occur as a name of a portion of a liquid or a gas, but as part of the statement describing how they move. Fortunately, few people interpret empirical data in this way. It is rather said that in some forms of observations it seems as if a particle moved, whereas in some other forms of observations it seems as if something undulated. A more difficult problem arises in the case of extreme energeticism, in which the various forms of energy are considered to be motions, but it is at the same time assumed that these are not motions of anything that moves without being itself a motion. The reist cannot stand that, for he thinks that any formulation of the type "there is a motion of something" is simply an abbreviated form of the statement "something moves", where in the final formulation "something" is a name of a thing. But, fortunately, this is a discussion not so much with physicists as with some philosophers who engage in the philosophy of physics. And the controversies among philosophers are not so dangerous as controversies between a philosopher and a competent spokesman of physics. The latter controversies, too, are not mortally dangerous, for the conflict is neither with experimental data, nor with the computational aspects of physics, nor with the technological achievements of that discipline, but rather with the various hypotheses in the field of theoretical physics, hypotheses which apparently are not free from inconsistencies.

Most headaches are caused by mathematics. Do what you can, it is said, but numbers are not things, and arithmetic is a set of theorems about numbers. Likewise, points, straight lines, curves, surfaces, etc., are not thnigs, and geometry is a set of theorems about such objects. The reist can only mention shyly that primitive arithmetic just consisted in numbering persons, tools, or other things. Two apples, three apples, etc., can be interpreted as a thing: it can be placed in a basket, it can be weighted, etc. Do then not all computations, intricate as they may be, reduce to descriptions of such wholes, recorded in an abbreviated

substitutive manner ? Moreover, it has been demonstrated that the term "two", which is the name of a number, can easily be eliminated from such a sentence as "In this basket there are two apples". This sentence means the same as: "A thing is an apple in this basket, and some other thing is an apple in this basket, and if something is an apple in this basket, then it is identical either with the former or with the latter thing." In the same way we can eliminate the term "three", and if a person lives long enough and is willing to pay the price of lengthiness and clumsiness of formulation, he can eliminate the name of any natural number, and that, of course, applied not only to apples, but also to any kind of things. And it is common knowledge that all kinds of numbers as used in arithmetic are by definition reducible to natural numbers.

When it comes to geometry, it is known that the rise of abstract geometry was preceded by concrete geometry, where reference was made not to dimensionless points, but to "traces of punctures" (since such is the original meaning of the Greek "στίγμα" and the Latin "punctum"), and not to one-dimensional straight lines, but to rods, etc. Even now, when we want to visualize to a person an object of abstract geometry we very often resort to a model made of rods and knots or a drawing consisting of lines and round patches, made by chalk or pencil. Hence it may turn out, on closer investigation, that all abstract geometry may be interpreted as an enormous abbreviation of a system of truths about things, in accordance with the origin and the applications of that discipline. Is it a prospect of a rest in an oasis, or just a fata morgana ?

But let us now turn to the summit of mathematical abstraction, since it is there that the decisive battle is to be thought between reism and reborn Platonism, very self-confident and so far triumphant. The conflict focuses on the concept of set, fundamental in contemporary set theory. There have been endeavours to do without that concept. Leśniewski constructed his mereology as a system expected to be a rival of set theory. Similar systems were constructed by Goodman and Leonard and termed the calculus of individuals. In those systems a set may be interpreted as a thing. For instance, in mereology an

organism is a set of its organs, and also a set of its cells. And if, whenever a thing is a set of some M's, then each of those M's is its element, then it always happens that not only the M's, but also certain N's which are not M's, are elements of the set of M's. For instance, the organs of an organism, although they are not its cells, turn out to be elements of the set of the cells of that organism, since here the organism as the set of its own cells is identical with the set of its own organs. In this way Leśniewski tried to solve Russell's antinomy, by questioning that step in the reasoning in which from the assumption that something is an element of a set of M's it is concluded that that something is an M.

But neither mereology nor the calculus of individuals have proved viable and fertile. On the contrary, Cantor's set theory, in which a set is interpreted so that if something is an element of a set of M's, then that something is an M too, has proved a great success in mathematics. In that theory, a set is not a thing, and "to be an element of a set of M's" means the same as "to be an M", but it does not mean to be a fragment of that set, as mereology assumes. Consequently, if something is the set of M's, then it is not the set of N's, if the term "N" is not co-extensional with the term "M".

Now the sets interpreted in this way cause much headache to the reists. If the term "set" is not a name of a thing, then they ought to be able to eliminate it just as any other abstract term. This can be done in some cases, but in some only. We have mentioned one such case at the beginning, when reference was made to the term "class", which means the same as the term "set". For instance the sentence "The set of selfcontradictory things is empty" can easily be replaced by the formulation "No thing is selfcontradictory". But the statements which include an iteration of the term "set", even in the simplest form as "a set of sets", have so far defied all reistic reduction. And in the arithmetic based on set theory the power of a set, that is its cardinal number, is defined as "the set of the sets equinumerous with the set in question". This is why unless the concretists overcome this obstacle, they cannot consider their fundamental claim to have been proved satisfactorily.

Finally logic itself, although it has prompted the ideas of reism (concretism), presents puzzles that have so far found no solution. For instance, the sentencial calculus questions the claims of radical reism that not only should the final formulations include no abstract terms, but that every final formulation ought to include at least one name of a thing to which that formulation refers. The theses of the sentential calculus, such as $p \rightarrow p$, $p \wedge q \rightarrow q \wedge p$, $(p \rightarrow q) \rightarrow (\sim q \rightarrow \sim p)$, $\sim(p \wedge q) \rightarrow (\sim p \vee \sim q)$, do not include any names at all. The connectives which occur in them are not names at all, and the variables are not names either; in particular, they are not names of sentences, they are not predicates (subjective complements) referring to the sentences which they stand for. Such theses do not cause alarm of the reists if it is assumed that they are not any statements subject to verification as to their truth and/or falsehood, but merely schemata of sentences, constructed so that they yield true sentences whenever any sentences are substituted for the variables, provided that the like sentences are substituted for the like variables. But this argument fails when it comes to those theses of the sentential calculus which have no free variables, namely the theses accepted by certain logical systems, in which the sentential variables are bound by quantifiers. We obtain then such theses as $\wedge p\,(p \rightarrow p)$, $\wedge p \wedge q\,(p \vee q \rightarrow q \vee p)$, $\wedge p \wedge q\,[(p \rightarrow q) \rightarrow (\sim q \rightarrow \sim p)]$, $\wedge p \wedge q\,[\sim(p \vee q) \rightarrow (\sim p \vee \sim q)]$ or theses in which the existential quantifier occurs: $\vee p \wedge q(p \rightarrow q)$, $\wedge p \vee q(p \rightarrow q)$, etc. Such theses are universally believed, and probably rightly so, to be declarative sentences (statements) liable to verification as to truth and/or falsehood. And yet experts in logic say that they are sentences without names of things, since those sentences do not include any names at all. The reist could try to argue that these are merely abbreviated and substitutive statements which stand for their final equivalents that include names. Consider, for instance, the sentence $\wedge p(p \rightarrow p)$. It is read "for every p, if p, then p". But this does not mean anything else than an abbreviated statement of a lengthy formulation: "If any sentence is substituted for the letter p, then the inscription $p \rightarrow p$ always yields a true sentence." And this formulation includes such names as "sentence" and "the

letter p", which usually are names of definite linguistic phrases. But the critics of reism consider this argumentation to be inadequate, which, as they claim, can be proved by the following example. Consider a logical thesis that belongs to that branch of logic which includes individual variables, and not to the sentential calculus. Let that thesis be: $\bigwedge x(x = x)$, which is read: "For any x, x is identical with x." Now it is claimed that this thesis may not be interpreted as an abbreviated substitute of the sentence: "Whatever name of an individual is substituted for x, the inscription x = x always yields a true sentence." It is so because the first of these sentences is supposed to refer to a nondenumerable set of individuals, whereas the second refers only to a finite set of the names substitutable for x, because the operation of substitution, finite by its very nature, can yield only a finite number of substitutions.

If these objections of the opponents of reism are justified (which for the time being I would not like to settle once and for all), then the reistic reduction of those sentences which do not explicitly refer to words, sentences, and other linguistic entities, to sentences including names of such entities, fails at least as a general method when applied to certain categories of sentences. In logical terminology, this means a lack of an association, by the relation of equisignificance, between statements in the object language and statements in the metalanguage, that is in the language that comprises names of expressions belonging to the object language. This resembles the relationships encountered previously: the reistic reduction can be performed in certain very simple cases, but it fails in more complicated ones. Here is a case in which such a reduction can be made. Consider the sentence: "Divisibility by 6 is a sufficient condition of divisibility by 2." It seems that there will be no objection to treating this sentence as an abbreviated but equisignificant form of the sentence: "The formula 'x is divisible by 2' can be deduced from the formula 'x is divisible by 6'." The terms "divisibility" and "condition", which are not names of things, have vanished; we have instead other names, such as "formula", "deducible", "x is divisible by 2", "x is divisible by 6", but these are simple or compound names of linguistic entities,

and hence of certain things, since inscriptions are physical bodies, that is, things. But a reduction of object-language expressions to metalinguistic expressions is, as is asserted by authoritative logicians, not always possible, as was demonstrated above, when we tried to cover by it the cases in which quantifiers occur.

When in logic reference is made directly to linguistic expressions, that is in metalogical research, semantic problems arise. The issue is, what is denoted by the expressions of the language in question. The reist willingly uses such a relation of denotation which links a name with a thing about which it can truly be predicated; those logicians who are not reists and who now form an overwhelming majority, also admit the relation of denotation between certain expressions and properties ascribed to things, between certain other expressions and relations between things, etc. Now properties, relations, etc., are not things. Moreover, nonreistic semantics willingly uses the concept of set as borrowed from set theory, the concept which is causing so much headache to the concretists.

I am drawing to the end of my paper on the universal claims and so far limited achievements of reism (concretism). By way of conclusion I shall say a few words about the essential modification of the fundamental issue. At first, the problem was formulated very firmly and very ontologically: only things exist or, in other words, every object is a thing. This was, obviously, a claim, and the problem was to demonstrate that if a person thinks that not only things exist and that there are objects which are not things, he is basically mistaken. But then the issue was how to understand the terms "object" and "thing" and the word "exists". Endeavours were made to define "object" as the most general term, co-extensional with the term "something", and to define "thing" as "something which is extensive spatially and temporally, and resistant (in the physical sense of the word, as resisting a physical pressure)". To the question, what the word "exists" means, the reist replies that "A exists" is the same as "$\bigvee$x (x is A)", or "for some x, x is A". "There exists at the most one A" is the same as "$\bigwedge$y$\bigwedge$y [(x is A) $\wedge$ (y is A) $\rightarrow$ (y is y)]", and "there

exists one and only one A" is the same as "A exists" and "there exists at the most one A". "A is an object" would mean the same as" "there exists one and only one A". With these definitional assumptions it was further stated that every object is a thing, that is, that if A is an object then A is a thing, or, in still other words, that only things exist.

But with such a logical structure of the system the scope of permissible substitutions for x remained puzzling. Should that scope be confined to names of the various things, then reism would boil down to the trivial tautology stating that every thing is a thing. But logic admits quantification of variables belonging to various logical categories. Hence if x could be interpreted as standing for individuals belonging to categories other than names of thnigs, for instance, names of the various situations represented by declarative sentences, then in the formulation "A is an object" "A" would be a sentence, and the situation it describes would be a thing, if we insisted that every object is a thing. But it would be absurd to state that a situation is a thing. Thus the reists had to choose between being spokesmen of triviality or spokesmen of an absurdity. Fortunately, those difficulties could be eliminated when one realized that the main intention of reism could be formulated without any reference to the word "exists". Reism states simply that every declarative sentence is a statement about things and about things only, in other words, that if abbreviations and substitutions are eliminated, then all the names that are not names of things vanish, and at least one name of a thing remains. We continue to say that only things exist, meaning by a thing a physical body or its part (as mentioned previously), and when we say about something that it exists we merely state that it acts physically on something else. In addition to this interpretation of the word "to exist" we admit its other logical interpretations, be it as many interpretations as many syntactical categories there are in a given logical system. Nor do we renounce the formulation that every object is a thing, but we mean by it that that of which we speak always is a thing, since it is always a close or remote stimulus, direct or indirect, to which our cognition is a response. Formulated in this way, the claims of reism may be erroneous

or illusory, but they probably are neither a triviality nor a logical nonsense.

Thus reism, from an ontological doctrine with a semantic spicing, has evolved into a semantic doctrine with an ontological spicing. But it has also evolved in one more respect: at first it was claimed that any declarative sentence which cannot be freed from abstract terms, is a nonsense; now it is less radical, it does not challenge those who think otherwise, but merely suggests a programme. It persuades to try to do without names that are not names of things, when one describes reality, and always to leave in such a description some name(s) of things. In its present stage reism is still unable to cope with certain difficulties offered by the exact sciences, especially by logic and mathematics. Its hope that its programme may still be carried out rests in the fact that it must oppose not the theses of those disciplines, but their cognitive and ontological interpretations. Let it be borne in mind that differential calculus has survived during our lifetime, but there is no longer any necessity to interpret it as a discipline concerned with infinitesimally small quantities; that the symbols of the imaginry numbers have survived, but a geometrical interpretation of the symbol $\sqrt{-1}$, which was formerly believed to be a kind of legalized absurdity, a symbol of imaginary existence, has been found. Be it as it may, whether we expect a complete or only a limited success, we feel in our right to recall the sound of the Occam's razor. Repetamus ergo: entia non sunt multiplicanda praeter necessitatem.

Warsaw Tadeusz KOTARBINSKI