

Euathlus and Crocodile paradoxes: dialectic solution's advantages

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Abstract. The paper is devoted to two ancient legal cases which, to date, have had no uniform solution: The Euathlus paradox and The Crocodile paradox. The aim of this work is not only searching logically faultless solution of both problems, but also developing the general approach to solving any similar cases without involving principles other than formal logic and the primary contract between litigants. The central problem of the research is that of incompleteness of this problem provisions, resulting in a set of various treatments the same questions. In the paper the following problems are solved: four exhaustive approaches to the problem of legal cases, which are called formal, authoritative, liberal and dialectic, are specified; the solution of the Euathlus paradox, which is inevitable with all the four approaches in the condition of their consistent application, is obtained; the solution of the Crocodile paradox, which is true with the dialectic approach, but impossible with three others, is obtained; it is proved that the dialectic approach not only combines the advantages of the first three approaches, but it is without their disadvantages that makes it a unique worthy applicant for the role of the universal approach.

1 Introduction

The paper is devoted to two ancient legal cases which, to date, have had no uniform solution: The Euathlus paradox and The Crocodile paradox. The aim of this work is not only searching logically faultless solution of both problems, but also developing the general approach to solving any similar cases without involving principles other than formal logic and the primary contract between litigants.

In spite of the fact that the known solutions of the paradox called in literature Rhetor's Dilemma, Paradox in Court, Protagoras-Euathlus paradox or The Contract of Protagoras, are offered by Lorenzo Valla (1406-1457) and by G. W. Leibniz (1646-1716) in his doctoral dissertation [1-3], however, so far, this problem continues to be considered by researchers from different sides [4-6]. Jankowski asserts that Leibniz's way of dealing with the dilemma is more juridical than most solutions, using principles of law to find a way out of the seemingly paradox situation [7], which, however, does not mean it the best one. It is impossible to solve this paradox without using the logic apparatus. Many authors seek to

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use it for explaining logic bases to future lawyers [8-10], that fulfils the conditions of modern education [11-13], however, especially, demands a deep logic analysis of the problem.

The Euathlus paradox (1) is connected with the real story how the sophist Protagoras started to teach the art of winning court cases to Euathlus for money. Then the contract was concluded, on which account Euathlus was to pay Protagoras 10,000 drachmas for the instruction *after the first case won by him*. According to Goossens' formulation, he will pay Protagoras when and only when he first win a case [15].

The problem is that Euathlus did not intend to commence trials, i.e. the contract provisions threatened to pay nothing to Protagoras. When, having realized that, Protagoras sued Euathlus, the views differed:

1) Protagoras declared, if Euathlus loses the case, he will be obliged to pay the rest of the fee, because of the verdict of the judges; but if Euathlus wins, he will also be obliged to pay this time because of his contract with Protagoras [16]. In both cases, Euathlus *should* pay.

2) Euathlus, on the contrary, declared, if he loses the case, he will not be obliged to pay, because of the contract; and if he wins, he will not be obliged to pay, because of the verdict of the judges. In both cases, Euathlus *should not* pay.

The legend says that the judges refused to try the case, having considered the dispute on payment to be insoluble. However, it is enough to pay casual attention to the problem specification in order to understand: it is not the question, whether Euathlus was to pay *because of the contract*, which is disputable. For the contract answers this question quite definitely, though in the conditional form: *yes, he was to, if had already won the first case; no, he was not to, since he had not won any case*.

It is also obvious that both sophists, if desired, *could* have respected the contract, not falling in any paradoxes. Protagoras is obliged to wait for Euathlus to win any case, and have not to claim for the payment *before that*. Euathlus should just have declared that he will pay Protagoras, but not before the court and as soon as he wins, because of the contract. If the judges had confirmed the fidelity of *such* argument, they, thereby, would have acknowledged Euathlus's victory, which would have followed the instruction payment at once both because of the contract, and because of the verdict of the judges.

However, the problem is that both sophists *do not wish to respect the contract*. Everyone insists on his respecting where it is beneficial for him, but, for some reason, demands the contract cancellation where it is beneficial for his opponent:

1) Protagoras demands that the contract be respected only if Protagoras defeats, but for some reason, be cancelled in his victory so that in both cases he could receive the money.

2) Euathlus, on the contrary, demands that the contract to be respected only at Euathlus's defeat, but for some reason, be cancelled in his victory so that in both cases he acquired the right to pay Protagoras nothing.

Thus, both sophists insist on partial cancellation of the contract, and there is an exclusive dispute when the contract is to be cancelled: at the victory of Protagoras or Euathlus? At first sight, it seems strange that such question has arisen! For, on the one hand, no item in the contract demands its cancellation because of the verdict of the judges. On the other hand, *no* item in the contract also *disallows* to think that such cancellation is to take place! As everything, that is not disallowed, is usually considered to be *allowed*.

2 Methods

The problem is solved by a dichotomous method, with which the exhaustive system of all possible treatments is deduced, and the only solution is approved, which at all assumptions follows with equal necessity, i.e. this solution is identically true.

Some researchers consider that this problem specification is incomplete for its unambiguous solution. They also refer it not only to the question on the contract cancellation. There is also an unclear question, how “the first case won by Euathlus” is understood, after which, because of the agreement, the payment is to be made:

1) Some, like A. Akhvlediani [17] and Aqvist [9], assure that it is the first case with Euathlus’s participation; that if he loses this first case, Protagoras will not be paid even if, in future, Euathlus starts to win.

2) The others, like E.Lisanyuk [18], consider a more “realistic” treatment: that it is the first case which Euathlus wins, irrespective of the fact how many cases he has lost before.

As *no* item in the contract *disallows* any of these treatments, it may seem as if both of them are admissible. However, it is offered, while choosing any of them, to proceed not from which seems more “probable” or “realistic” but from which in general makes sense, in the light of their necessary relation with already mentioned question on the contract cancellation because of the verdict of the judges. For there is one of the two:

1) If the court cancels the contract after the verdict return, it means the payment problem is solved within the limits of the first case, i.e. other trials of the given case are excluded, so, A.Akhvlediani's treatment is chosen.

2) If the court remains the contract valid after the verdict return, it means, the payment problem is not solved, i.e. its solution is removed to other trials, so E. Lisanyuk's treatment is chosen.

Thus, these two questions are reduced to one. Their unambiguous solution, as it will be shown, is possible by those conclusions, which *inevitably follow at any approach* to treatment of issues not stipulated. Therefore, the obvious incompleteness of this contract does not provide the grounds to judge the problem insolvability.

Besides that, according to the first theorem of K.Gödel, any contract, limited by the system of rules, is always incomplete. For it always contains a number of undefined issues by which all the others are defined.

Hence the conclusion: if it is considered that these undefined issues do not have any content at all, there is no content in the whole contract which is defined by them. If this latent content presents, then within the limits of this contract it is equally both true, and indemonstrable. In particular, the item on the contract cancellation because of the verdict of the judges may *initially be part of the contract by default*, but meanpoint just intuitively; and it is possible to understand this latent content only after solving these two questions:

1) Should the judge while treating the undefined issues of the contract be guided only (A) *by mutual approval of the parties*, or (A') is it possible to involve the treatments which do not cause a general approval?

2) Should the judge consider the treatments offered by the parties (B) *only in the form of the initial contract*, or (B') is it possible to consider also the opinions, stated by them post factum?

As these both questions suppose two answers, there are four exhaustive approaches to the problem solution (AB, A'B, A'B' and AB'), each of them should be assessed for its validity.

The formal approach (AB) is that (A) is to be guided only by the mutual approval of the parties, and (B) only in the form of the initial contract, not involving the new treatments stated post factum for solving any other principles.

It is this approach, that is considered by some mathematicians (G. W. Leibniz, R. Smullyan, etc.) to be applied to the Euathlus paradox. Here is their opinion: “The Court should enter the judgment in the pupil’s favor, i.e., the pupil is not to pay Protagoras as by the beginning of the trial the pupil has not won his first case yet. When the trial is over, the pupil, because of the contract, is to pay Protagoras some money. Therefore, Protagoras should return to the court and open another case against his pupil. This time, the court

should enter the judgment in Protagoras's favor as by the beginning of the second trial the pupil have already won his first case" [19], writes R. Smullyan.

The given solution, for the first time offered by G. W. Leibniz, can seem faultless leaving aside the fact that Euathlus just denies it! Euathlus's thesis at the court just says, that he *is not be obliged to pay at all: neither now, nor after the case won*, which equally contradicts both G. W. Leibniz's solution, and the contract language. Therefore, it contradicts also the formal approach principle. How can the formal court give the win to the one who denies its principle, i.e. Euathlus?

Researchers have already criticized G. W. Leibniz's answer: "Essentially, G. W. Leibniz suggests to replace backdating the formulation of the contract and to stipulate that the first case of Euathlus which will solve the payment problem should not be Protagoras's claim. This idea is deep, but does not concern the concrete trial. If there were such a reservation in the initial contract, the trial would not be necessary at all» [14], - considers A. Ivin. Thus:

1) If G. W. Leibniz tried to eliminate the specified contradiction, he did it by introducing the new reservation in the contract, which is not compatible to the principle (B) of the formal approach.

2) Even accepting the specified reservation does not rescue G. W. Leibniz's solution; after all, if Euathlus wins *at this trial* and it is not considered the payment basis, then Protagoras cannot demand it at the following trial.

Some supporters of this solution, however, tried to remove this contradiction *differently*. For example, due to the legislation because of which Euathlus, if he wins, has ostensibly the right to demand indemnification from Protagoras in the claim sum: "In this case Protagoras will pay Euathlus 10,000 thousand drachmas because of the verdict of the judges, and Euathlus will pay Protagoras the same 10,000 thousand drachmas because of the contract <...>. Thus, as a result of the court decision, Protagoras *will formally receive the fee* from Euathlus with his own money, *and he will not receive the money really earned* for teaching Euathlus" [17], - writes A. Akhvlediani, from here concluding: "From the point of view of legal proceedings Protagoras's argument *is formally executed, but really is not*. Euathlus's argument *is executed really, but formally is not*" [17]. However, this attempt to remove this contradiction through ambiguity causes two objections:

1) Whence A. Akhvlediani deduced, that Protagoras receives the payment with "his own money"? After all, as soon as he pays it to Euathlus as indemnification, the money will become Euathlus's; and Protagoras will receive the money as not that of "his own".

2) Even if it is neglected and recognized, that Euathlus pays Protagoras *formally, but really will not pay*, all the same, it is unclear why the court should take into consideration only the second one and ignore the first one.

After all, if the court considered both of these, it should have recognized that Euathlus *has won really*, and Protagoras *has won formally!* But for some reason A. Akhvlediani insists that "<...> from the formal and real points of view *Euathlus will win the case*" [17], i.e., for some reason, the court should define the payment *not on formal remittance* from Euathlus to Protagoras, but *on real profit* which Protagoras *will not receive* as a result. No references to the legislation will support it for two reasons:

1) Usually, the payment fact is registered upon formal remittance, but not on someone's real profit, i.e., the legislation, which would support A. Akhvlediani's solution, just does not exist.

2) But if it existed, it would allow taking any honest person to the court for non-payment of the income tax; on the ground that he *pays this tax formally, but does not pay it really*.

In fact, if the tax is subtracted from the salary automatically, the tax bearer does not really receive this money; so, (s)he cannot really pay. However, whoever heard of someone being on trial for that?

It is obvious that A. Akhvediani, as well as G. W. Leibniz, proceeds not from the legislation and the contract language, but from free treatment of its latent content that respects the principle of *the authoritative approach (A'B)* which will be considered in detail further. The formal approach demands to draw conclusions only from the contract language, not asserting any treatments in its latent content, which is possible to be understood in two ways:

1) Either all possible treatments of the latent content *are supposed equally*, though not any is affirmed; then, in particular, it is admissible also that the contract can be cancelled at any moment.

2) Or, on the contrary, any intuitive treatment is not considered admissible, i.e., *all of them are ignored as nonexistent*, so, they cannot cancel the conclusions directly following from the contract language.

The first one is excluded, as an assumption, that a certain contract can be cancelled at any moment, makes its use impossible; and to find out the fidelity of this assumption, asking the contract participants' approval for it, contradicts the principle (*B*) of the formal approach.

Therefore, it is necessary to choose the second one: just to ignore the latent content of the contract and, so, any its problems. Then, the formal approach would oblige the judge to make an absolutely other decision. Just because this approach demands to ignore the latent content (and, in particular, the latent assumption that the contract is cancelled because of the verdict of the judges), i.e., it follows *only the contract language*, and both sophists violate it equally:

1) Protagoras violates it bringing his pupil the unfair, premature claim for non-payment though he knows that his pupil has not won any case yet, and, because of the contract, he is not obliged to pay.

2) Euathlus violates it not wishing to pay Protagoras in advance even after his victory at the trial, though he knows that exactly in this case, because of the contract, he is obliged to do it.

Thus, the consecutive formal approach would force the judge to recognize both sophists, because of the contract, as *equally wrong*, and to award the defeat to *the both*. As to the payment problem, it would be solved: since Euathlus defeated equally as Protagoras did, after the trial he *is not obliged* pay Protagoras. However, the contract, according to the formal approach, should be remained valid, since there is no item on its cancellation necessity. It means that after the trial Protagoras can receive Euathlus's fee, but only not before Euathlus win any other case.

The problem is that *the latent content* of the contract, as already mentioned, defines its *primary sense*. Ignoring the first, the formalistic approach thereby deforms the second, and its disadvantage is in it. Besides, it is just inapplicable on the occasions where paradoxes follow not from different treatments of the latent content, but directly from the contract language.

For example, see the Crocodile paradox, where such problem just takes place, further. If this problem is considered a formal reason to cancel the contract, without taking into account its latent content, the problem will appear to be insoluble at all.

Therefore, only one of three substantial approaches, which treat the latent content of contracts, could be considered *universal*, guided by either authoritative or non-authoritative principle.

The authoritative approach (A'B) is that (*A'*) the judge has the right to involve the treatments which are not approved by the parties, but thus (*B*) all treatments offered by the parties should be considered only in the form of the primary contract.

In practice it means that the judge has the right to solve any question, which has no answer in the contract text, how (s)he *wants*, not seeking the approval of the parties. Even

if, as a result, the primary sense of their contract appears completely deformed by it, nobody would have the right to challenge the authoritative judge, since “<...> the verdict of the judges should be stronger than the private contract of two people” [14]. Moreover, it is reasonable in the sense that the court is due to make a final decision.

It can even seem that such approach does not limit the judge to anything, allowing him or her to award the victory to any party on any bases (e.g., “Any work should be paid”, so, Protagoras wins; or “Make way for young talents”, therefore, Euathlus wins, etc.). However, that is not true as “<...> the condition of all our judgements in general is that they are not to contradict themselves” [20], - marks I. Kant.

It means that the consistent authoritative judge, at least, should not make the decisions contradicting his or her other decisions. In particular, (s)he has no right to award the victory to the one who *challenges the judge's decision in advance*, for it contradicts the authoritative approach principle. That is how both sophists behave:

1) Protagoras in advance challenges the verdict, which will relieve Euathlus from his obligation to pay, and he recognizes only such decision by which he would receive his money; otherwise, he prefers the contract language.

2) Euathlus in advance challenges the verdict which will oblige him to pay, and he recognizes only such decision, which would relieve him from this obligation; otherwise, he also prefers the contract language.

Thus, the consistent authoritative approach, as well as the formal one, would force the judge to recognize both sophists *as equally wrong*, and to award the defeat to *the both*. However, not for breaching the contract language, but for contesting the judicial authority.

As to the payment problem, it would be solved like this: since Euathlus lost as well as Protagoras did, after the trial he *is still not obliged to pay* Protagoras yet. However, according to the authoritative approach the contract should be remained valid, since other opinion of the judge would contradict his or her former decision. After all, if the court, recognizing both sophists wrong, cancels the contract, Euathlus is not obliged to pay Protagoras *either at this defeat, or at the first victory in any other trial*. Then Euathlus will appear the winner, for its position (according to the both items) will become a true reflexion of the verdict post factum, and not an attempt to challenge it:

1) Euathlus's basic thesis in the court is that *neither at the defeat, nor after the victory he is not obliged to pay*. It is true, if the court cancels the contract at the defeat of the both.

2) Euathlus's latent thesis is that at the victory of his basic thesis the contract should be cancelled by the court decision. Moreover, it will also appear true if the court cancels the contract, having confirmed Euathlus's basic thesis.

If the court, having cancelled the contract, considers Euathlus right and awards the victory to him at the trial, there will be another contradiction: after all, it is post factum the verdict that Euathlus will appear *right*. Whereas Euathlus's thesis was made *before this verdict*, i.e. at the moment when it *was not true* neither de facto, nor de jure yet, and it was only an attempt to challenge another possible verdict, contrary to the principle (B) of the authoritative approach.

Thus, the consistent authoritative approach, as well as the formal one, would remain the contract, according to which Protagoras can receive Euathlus's fee, valid; but not as early as Euathlus wins another case.

The disadvantage of the authoritative approach is that, though it removes any incidents, quite often it completely deprives the judicial-contractual system of its meaning. After all, it has the only meaning: *to bring any violator of the contract to respecting it by the trial*. But if the authoritative approach allows the judge to change the contract content with new treatments, then (s)he has the right to change it in favor of the violator as well.

The only case, when the authoritative approach is completely free from this disadvantage and is rather pertinent, is when the judge interprets laws as either the

legislator, or the scientific expert appointed by the legislator. However, it is not pertinent where the judge interprets the content of *the contract of other people*: “The court should make the decision regarding it and on its basis” [14], - marks A. Ivin.

Therefore, it is possible to define as *universal* only one of two remained egalitarian approaches which consider the parties’ opinions: the purely liberal or illiberal principles.

The liberal approach (A'B') is: (A') it is possible to involve the treatments, which do not cause the general approval of the parties; and *(B')* it is possible to consider the treatments offered by the parties not only in the form of the primary contract, but also in the form of the opinions stated by them post factum the contract.

In practice it means, that any item, which is not defined by the contract language, can be treated by each participant *how (s)he wishes, not asking the opponents’ approval*. This equal right of each participant to one’s own treatment defines the egalitarianism of this approach.

The first one, who selected this approach to settle disputes, was a participant of this story Protagoras from Abdera. He taught that any opinion is true for those who trust in it, and is false for those who deny it: “Man is the measure of all things – existence of the existent and non-existence of nonexistent” [21], - taught Protagoras.

At the first sight, it seems that this dead-end axiom will not allow solving Euathlus’s case. If divergent treatments of both sophists are considered equally competent (i.e., being part of the contract by default), it will appear that “<...> the contract, despite its quite innocent appearance, is internally inconsistent” [14], - writes A.A. Ivin.

However, this contradiction, as seen now, consists not in the contract itself, and not in the liberal approach to its treatment, but only in inconsistent application of this approach.

For, if the treatment of each participant *is correct for him, but it is incorrect for his opponent*, then the both should apply their treatments only where they will appear correct, i.e., *only concerning themselves*. However, thus, nobody has the right to impose the own treatment on those for whom it is incorrect:

1) Protagoras, for example, can think that the contract is cancelled if Protagoras wins, and it remains in force at his defeat; but he has no right to impose it as a correct one on Euathlus.

2) Euathlus, on the contrary, has the right to think that the contract is cancelled only if Euathlus wins, and it remains in force at his defeat; but he also has no right to impose this treatment as a correct one on Protagoras.

Meanwhile, both sophists just *impose the treatments on each other at the trial*, for, if they wished to impose nothing on each other, there would be no trial at all. Therefore, the consistent liberal approach, like the formal and authoritative ones, would force the court to recognize both sophists *as equally wrong* and to award the defeat *to the both*. However, not for breaching the contract language and not for contesting the judicial authority, but for intolerance to each other’s treatments.

As to the payment problem, it would be solved like this: since Euathlus lost as well as Protagoras did, after the trial he *is still not obliged to pay* Protagoras yet. However, according to the liberal approach the contract has to be remained valid, since each of sophists insisted on its cancellation *only at the victory*; and at the defeat they demanded the contract to be guided. It means, at the defeat of the both, the contract remains in force *according to both treatments*, i.e., the liberal judge will decide that Protagoras can receive the payment from Euathlus; but not as early as Euathlus wins another case.

The disadvantage of the similar approach is that it, even more, rather than the authoritative one, deprives the judicial-contractual system of its meaning. After all, it allows any violator of the contract to completely change its content with his new treatments, i.e., to justify violation by his ostensible interpretation of the contract in contrast to his opponent’s.

Therefore, among all four approaches it is possible to consider as a *universal one* only the approach called *dialectic*. Since it unites the advantages of the three approaches, described above, opposite to it, but it has, thus, no specified disadvantages. Even if no legal problem is solved with its help, there is nothing better, all the same.

The *dialectic approach* (*AB'*) is (*A*) to be guided by the mutual approval of the parties anywhere, and (*B'*) it is possible to consider the treatments offered by the parties not only in the form of the primary contract, but also in the form of the opinions stated by them post factum the contract.

In practice, it means that any question, which has no answer in the contract text, should be solved basing on those treatments which all participants of the discussion accept. Only *these* treatments should be considered a part of the contract by default. The other treatments, which are not approved, should be either proved logically from the first ones, or excluded as incorrect ones.

In particular, the question on the contract cancellation because of the verdict of the judges should be solved also basing on the mutual approval. And since *the approval can be direct or indirect*, the dialectic approach means, in the latent content of any contract, only two amendments, which allow to cancel this contract on its very basis:

1) The indirect approval can be ascertained where no possible action of the contract participants results in its respect; then its cancellation approval is guaranteed, per se, even if someone objects in word.

2) The direct approval can be ascertained where both parties either directly declare the unwillingness to respect it, or just do not object its cancellation, i.e., accept it by default.

Neither of these amendments, however, can be applied in Euathlus's case. Firstly, both participants *had* possibility to respect the contract, as mentioned above. Therefore, it is impossible to cancel it basing on the first amendment. Secondly, though both participants accept that, because of any verdict, the contract is to be cancelled, but there is no approval *which exact case* it will be. Therefore, it is impossible to cancel the contract basing on the second amendment *in any real case*. Therefore, the consistent dialectic approach will oblige the court to remain the contract valid at any outcome of the trial.

Then the court is obliged to recognize both sophists *equally wrong* and to award the defeat *to the both*. Only not for breaching the contract language, contesting the judicial authority and absence of tolerance, but for the requirement to cancel the contract contrary to the principle (*A*) of the dialectic approach.

As to the payment problem, it would be solved like this: since Euathlus lost as well as Protagoras did, after the trial he *is still not obliged* to pay Protagoras yet. However, the contract should be remained valid. Therefore, Protagoras can receive the fee from Euathlus; but not as early as Euathlus wins another case.

So four exhaustive approaches to this problem solution were considered, and it was found that all of them oblige the court to make the same decision, though on different bases. Only one of these approaches, called dialectic, solves the other, more difficult, paradox of the Crocodile.

The Crocodile Paradox (2) is connected with the legend how a certain Crocodile stole a certain Woman's child and concluded with her the contract according to which she will receive her child back if she truly answers the question whether he will give her the child or not? If the Woman answered, "Yes, you will", she would give the Crocodile carte blanche in any actions:

1) The Crocodile could give her the child; then the Woman's words would be *de facto true*, so, *de jure* she *should* receive her child, i.e., the Crocodile, having given her child, would act correctly *de jure*.

2) The Crocodile could not give her the child; then the Woman's words would be *de facto false*, so, *de jure* she *should not* receive her child, i.e. the Crocodile, not having given

her child, also would act correctly *de jure*.

However, if in both cases the Crocodile acts correctly *de jure*, it is simple to guess which choice he will make *de facto*. Moreover, in order to reserve her child or the right to demand it back, the Woman answered: “No, you will not”. Then the participants’ opinions diverged:

1) The Crocodile declared that he would not give her child; for if he *gives the child*, the Woman’s words will be *de facto false*, so, *de jure* it would be wrong to give her the child.

2) The Woman objected that, if he *does not give* her child, then her words, on the contrary, will be *de facto true*, so, *de jure* she *should* receive her child, that is, the Crocodile would be wrong all the same.

Thus, in both cases the Crocodile is wrong *de jure*. Moreover, which choice he will make *de facto* is clearly told by him himself. Therefore, the question is not: how should the Crocodile act, because of the contract, but which decision should the judge make if the Woman complains to the latter about the Crocodile? Which approach should the judge apply?

The authoritative and liberal approaches are excluded at once, because their application, as already mentioned above, deprives the judicial-contractual system of its meaning. As to the formal approach, it demands to follow the contract language where nothing says about necessity of its cancellation because of the verdict of the judges. It means, according to the formal approach, the contract should be remained valid *both to, and after* the trial. In addition, since the Crocodile is wrong at any choice of his, the formal court cannot oblige him to choose any, i.e., the problem will appear insoluble.

Something between the formal and authoritative approaches is shown by A. Akhvlediani’s research, which, by means of extraordinary difficult logic transformations, proves, that “<...> the Crocodile, according to his own demands, has grounds not to give the mother her child” [22]. However, it is true only with two reservations:

1) It was not necessary to prove these grounds; directly stated by the Crocodile in the problem specification, which says that, if the Crocodile gives her child, he will violate the contract.

2) These grounds are not obviously sufficient; for if the Crocodile does not give her child, all the same he will violate the contract, as the Woman mentioned it in the same specification of the problem; and it is here where this paradox is.

Hence the conclusion: if A. Akhvlediani, nevertheless, prefers the Crocodile’s position, and not because it is better suited to the contract language, but basing on absolutely other principles, confirming quite authoritatively.

For example, he proves, that “<...> the formula of the mother’s answer in the context of conjunction of formulas of the Crocodile’s provisions appears logically inconsistent” [22], which “<...> in any way we cannot confirm concerning the Crocodile’s formulas” [22]. However, it is thus forgotten that in the problem there is not the question whose position is less inconsistent, but who will receive the child, because of the contract. In addition, the formal approach cannot answer this question in favor of the Crocodile who is wrong at any choice.

Now the solution of this paradox by the *dialectic approach (AB’)* is investigated. The solution consists in the answer to two questions, the same as in Euathlus’s case: to whom the judge awards the victory, and whether the contract will be cancelled by the court decision, or it will remain valid after the trial.

Because of the contract, the answer to the first question depends on whether the Woman told the truth. In addition, it depends on whether the Crocodile will give her child or not. However, the saying “The Crocodile will give the child” causes disputes: does it mean that the Crocodile will give the child *voluntarily*, without compulsion, or the Woman *will receive her child*, no matter how?

Variant one. It can be assumed that the saying “The Crocodile will give the child” means the *voluntary return of the child*. Though it was found that the Crocodile will violate the contract in any case, but he can choose the way of violation:

1) If the Crocodile gives the child voluntarily, and the Woman receives her child voluntarily, the violation will occur by the mutual approval, so, the contract will be cancelled before the court decision, according to the second amendment.

2) If the Crocodile does not give the child, the Woman’s words will appear true, so, the court will be obliged to give her the child by force; and in any way, it will not contradict the fact that the Crocodile has not given her child voluntarily.

Therefore, in the latter case, the contract is not violated at all, and in the former case, it is violated only formally, but the violation is not real. In both cases, the Woman will receive her child.

Variant two. Now it can be assumed that the saying “The Crocodile will give the child” means not the way of the child’s return, but the fact of *receiving the child* by the Woman, no matter how. Then the problem becomes complicated a little. For if the Crocodile does not give the child voluntarily, the Woman can *receive* her child only by force, because of the verdict of the judges. Before the court decision, she *will not receive* her child exactly. Moreover, if it is assumed that the contract remains valid both before, and after the verdict, then the problem will appear insoluble, as already mentioned above:

1) If the judge recognizes that the Woman *will not receive* her child, her words will appear *true de facto*, so, de jure she should receive her child, i.e., the decision of the judge is incorrect de jure.

2) If the judge, on the contrary, recognizes that the Woman *will receive* her child, her words will appear *incorrect de facto*, so, de jure she *should not* receive her child, i.e., the decision of the judge is incorrect de jure, all the same.

It can be avoided with the first amendment, which says, that in the situation when no possible action of the contract participants results in its respect, the contract is cancelled basing on the indirect approval of the parties. As such situation arises only when the contract remains valid after the verdict, it is concluded that just after the court decision, whatever it is, the contract is cancelled, basing on the first amendment. However, it means that the contract remains valid only in the range from the beginning of the trial to its end. Then, there is one of the two:

1) If the Crocodile gives the child voluntarily, and the Woman receives her child voluntarily, the violation will occur by the mutual approval, so, before the court decision, the contract will be cancelled, according to the second amendment.

2) If the Crocodile does not give the child, it means that the Woman will not receive the child before the end of the trial, i.e., during the contract period, it will be true to return her the child, and then the contract will be cancelled at once, according to the first amendment.

So in both cases, the contract is violated formally, but the violation is not real basing on either direct or indirect approval of the parties. Actually, it means basing on the contract itself. It is also pleasant that in both cases the Woman will receive her child.

3 Results

Thus, the following problems were solved:

1) Four exhaustive approaches to the problem of legal cases, which are called formal, authoritative, liberal and dialectic, are specified.

2) The solution of the Euathlus paradox, which is inevitable with all the four approaches in the condition of their consistent application, is obtained.

3) The objective disadvantages of the first three approaches, which make them inapplicable for solving many other similar problems, are exposed.

4) The solution of the Crocodile paradox, which is true with the dialectic approach, but impossible with three others, is obtained.

5) It is proved that the dialectic approach not only combines the advantages of the first three approaches, but it is without their disadvantages that makes it a unique worthy applicant for the role of the universal approach.

4 Discussion

The importance of the problem is defined by the fact that during last decades the most dangerous of all known opinions on this issue has become most popular. Namely “<...> the dispute is insoluble and there will be no winner in it. It is only necessary to accept the present and to make sure of the future. This requires to reformulate initial contracts and rules so that they will not put anybody in such a desperate situation anymore” [14], writes A.A. Ivin.

However, he as though forgets that it is impossible to deduce logically from the consistent system of rules its consistency, according to the second theorem of K.Gödel. It means that the system of rules, even well thought over, *is not immune to revealing latent paradoxes in it*. Therefore, the only thing to do for the future is to develop the general approach to removing similar problems in the process of their revealing. As long as some scientists consider it impossible, and others simply ignore the problem, settling the disputes will depend only on the judges' arbitrariness.

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