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Turkhan Ismayilzada

A Framework for AI-Made Mistakes in German and English Contract Law

A Legal, Psychological and Technical Inquiry

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To my lovely big family. . .

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Contents

Chapter 1
Introduction

The role of advanced technologies, such as Artificial Intelligence (AI), in the contract formation process, is steadily increasing and the latter is becoming more autonomous than before. This raises many doctrinal questions, one of which is the issue of AI's potential mistakes in the contract formation process—the subject of the current research. It is necessary to tackle the issue of contractual mistakes in AI-made contracts with the autonomous character of the underlying decision-making process in mind. This approach might enable us to better assess the real impact of such technological evolution and propose an adequate response. This, in general terms, is the aim of the current research, i.e. to develop and propose a framework for AI-made mistakes in contract formation.

1.1 Aim and the Scope of the Research

Contracts are essentially social instruments that recognize the highest decentralized level of free exercise of individual autonomy and subsequently enable the participants of the civil turnover to make binding interactions with each other to meet their individual needs.[1] Contract law, in its turn, evolved as a mechanism to honour the binding commitments of the contracting parties by placing their respective consent at the centre of the contractual obligations, either as a promise or as a declaration of intent.[2] Since international trade has become a major driving force of the global economic growth in the nineteenth–twentieth centuries,[3] contracts make

[1] Suchman (2003).

[2] Granieri (2017), p. 412.

[3] Ortiz-Ospina and Beltekian (2018) talk about two waves of trade globalization, first in the nineteenth century due to the technological advances of the industrial revolution, and second in twentieth century after World War II; Nayyar (2006), p. 138.

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multijurisdictional subjectivity of legal relationships easier. This extrapolation has even increased more with the introduction and development of the Internet as a tool driving electronic commerce forward.[4]

In this sociological sense, modern-day technologies are similar to contracts, in the fact that they also allow individuals to solve their problems by exercising their free choice, however without possessing immediate legal nature. One of such technologies that stormed the mid-twentieth century computer science landscape and continues its evolution as one of the most disruptive and futuristic technologies is AI. Its rapid development as a separate research field and the huge number of investments driving the constant innovation have made it possible that almost every one of us encounters AI, in one form or another, in our daily and professional lives.[5] The area where the development of AI has still not reached its true potential but is steadily moving in that direction is autonomous contracting. This similarity in the character of contract and AI as social instruments allows their combined usage to optimise individual decision-making.[6] This is also backed up by the fundamental principle of contract law—freedom of contract.

The freedom of contract entails not only the freedom to conclude a contract but also the freedom to choose the means of doing so. In this regard, the individual participants of the civil turnover are free, as long as not explicitly prohibited by the law, to commission AI for contract formation purposes, including the possibility of AI itself concluding the contracts and the legal systems are compelled to guarantee the exercise of the freedom of contract in this way.[7] However, the task of guaranteeing this is not as easy and as simple as it might seem.

Until now, the legal systems and international harmonisation initiatives have offered partial solutions to the emerging problems in electronic contracting, e.g. acceptance of these as contracts as such.[8] This approach might have sufficed until now. However, going forward, the technological advancements and the increased learning capabilities of AI pose serious challenges to almost all the underlying fundamental pillars of contract law.[9] This, in its turn, necessitates a holistic approach and throughout consideration of the norms regarding AI contracting.

There are already numerous articles, books and policy papers written on some of the crucial doctrinal aspects of AI contracting, such as granting personality to AI,[10]

[4] Berman (2002), p. 332.

[5] Mou (2019).

[6] Cerf et al. (2020) demonstrate in the example of Blockchain technology, how smart contracts can contribute to more accurate capturing of individual preferences.

[7] Schulz (2015), p. 99.

[8] Granieri (2017), p. 410.

[9] Linarelli (2019); Grundmann and Hacker (2018); Ismayilzada (2019); Martin-Bariteau and Pavlovic (2021) argue that, in the opposite, common and civil law systems offer good doctrinal solutions to the use of AI for contracting purposes, when seen from a functional perspective.

[10] See Sect. 4.2.1.2.

attribution mechanisms of the legally relevant communications made by AI to its user,[11] and responsibility for AI-made damages.[12] These once more indicate an ongoing academic and policy debate over the potential problems that the legal system could encounter due to AI contracting. One of the issues that gets less attention than it actually deserves is the issue of contractual mistakes in AI-made contracts.

The academic[13] and judicial[14] considerations of this topic are rare and cover mostly the mistakes resulting from automated contractual decision-making by AI rather than autonomous. The problem with this restrictive view is that the technology behind electronic contracting has been evolving from Electronic Data Interchange[15] to blockchain-based "smart contracts"[16] and, lately, to automated AI contracting.[17] Thus, what might seem like a reasonable approach to automated AI will not be sufficient to face the challenges of autonomous AI contracting. Thus, it is necessary to tackle the issue of contractual mistakes in AI-made contracts with the autonomous character of the underlying decision-making process in mind. This approach might enable us to better assess the real impact of such technological evolution and propose an adequate response. This, in general terms, is the aim of the current research, i.e. to develop and propose a framework for AI-made mistakes in contract formation. For achieving this aim, the following research questions need to be considered:

1. What are the general mistake categories in English and German law based on the underlying characteristic of a mistake rather than its operativeness regime?
2. To what extend is the modern-day mistake doctrine based on contemporary psychology? What is a psychologically plausible criterion for the classification of mistakes?
3. What is AI, and what are the legal prerequisites for its participation in the contract formation process?
4. How similar is the human and AI contractual decision-making process and the errors occurring therein?
5. How feasible is a common framework for AI-made mistakes in contract formation in English and German law?

As with every research, however, there are some deliberate general limitations and assumptions in the current research that need to be kept in mind going forward.[18]

[11] See Sects. 4.2.2 and 4.2.3.

[12] See Chap. 4, n 170.

[13] See Chap. 5, n 8.

[14] See Chap. 5.

[15] Baum et al. (1990).

[16] For the practical guide on the implementation of smart contracts in the legal practice, see Levi and Lipton (2018).

[17] For the discussion on the potential of those technologies together, see Lee (1998); Grewal (2021).

[18] Further limitations of the scope of the research will be introduced throughout the main text of the work.

Thus, it is not the purpose of the current research to rethink the contractual mistake doctrine and reformulate its dogmas. Rather, the discussion on the AI-made contractual mistakes is used to revive the foundations of the current mistake doctrine and to consider them from a psychological and technological perspective. This would enable the evaluation of human and AI contractual decision-making processes as equally complex cognitive phenomena and allow the proposition of a legal framework that can be applied to AI-made mistakes based on the doctrinal primacies of the modern-day mistake doctrine. It is necessary in order to assess the legal problems that will result from the use of AI for autonomous contracting and understand how it will change the balance of interests protected and guaranteed by the law.[19]

The contract law is constantly adjusting to meet the needs of society, and the increased globalisation of e-commerce leads to the convergence of those needs across the legal systems.[20] AI's autonomous participation in the contract formation process is one of such needs of society, and it questions the doctrinal foundations of the contract law itself. Consequently, this issue needs throughout consideration before the number of contracts concluded this way skyrockets, as so does the number of cases that will land before the courts waiting resolution.[21] It is important to initiate the discussion on the challenges that the legal systems will face as a result of the advancements in technology and ways to overcome those challenges before the resilience of the legal regimes is questioned by their inability to deliver doctrinally justifiable results or the law itself is changed due to the consequences of technological pressure.[22]

This research aims at enlightening one of the many doctrinal issues that AI contracting raises—the issue of contractual mistakes. Considering that the AI contracting is going to entail international participants in a globalized economic schema of the world and that the participants of the civil turnover are likely to increasingly extrapolate the effects of their legal relations outside of the national boundaries, it would be beneficial to have a common framework for AI-made mistakes.[23] Further research and cooperation between legal systems on devising technologically neutral laws will still be needed to ensure that future challenges can be faced with an adequate regulatory response.

[19] Roßnagel (1997), p. 223.

[20] Markesinis et al. (2006), p. 5.

[21] European Parliament Resolution P8_TA(2017)0051, 16 February 2017, with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)) p. 2 considers the development of intelligent machines with the capacity for independent learning and decision-making as a cause for a variety of concerns about the direct and indirect consequences for the society, aside from the potential economic benefits; for the description of one of the first internationally debated cases in this area, see Chap. 5.

[22] Roßnagel (1997), p. 222; Ballell (2019).

[23] Granieri (2017), p. 413 argues that varying regulation of electronic contracting at n national levels can offset the benefits that this technology offers.

1.2 Methodology and the Structure of the Research

The methodological aspects of the current research can be divided into two components: comparative law and interdisciplinary research.

1.2.1 Comparative Legal Methodology

The reason why the research is done in the form of comparative legal analysis is the fact that the use of AI for contracting purposes, as all other cases for that matter,[24] poses universal problems, in the same or comparable way, in all the legal systems and the response to these problems may only be provided with a comprehensive analysis of the respective existing legal regimes in those legal systems.[25] However, proposing a framework that applies to every legal system around the world is an almost unachievable task and presents a counterproductive approach to solving the challenges. Also, it needs to be kept in mind that despite the general commonalities within the families of legal systems, each legal system has its own legislative and doctrinal culture, which cannot be ignored or disregarded for the sake of unification. In this regard, the current research will cover two prominent representatives of the common law and continental law– English and German legal systems accordingly.[26] This selection should allow other legal systems to benefit from applying the general framework laid down in this research without compromising the inapplicability of certain phenomena which are inconsistent with their legal culture.

Adopting a genealogical approach to the comparative law tradition,[27] before analysing the current stand of the law on contractual mistakes, the historical background of the legal development in this area will be considered in order to present the reader with a complete picture when it comes to the modern-day doctrines in English and German law.[28] It will be argued that even though those countries have considerably different legal cultures and legal scholarship traditions, their contractual mistake doctrines have a common historical background—Roman law of mistake.[29]

[24] Larenz and Canaris (1995), p. 15; Zweigert and Kötz (1996), p. 13.

[25] Granieri (2017), p. 410.

[26] Zweigert and Kötz (1996), p. 41 acknowledge that when comparing "classical" issues in civil law such as contract law, it makes sense to take English and German law as the representatives of the two big law families in the world. However, there will be seldom references to a US common law for illustrative and comparative purposes.

[27] Samuel (2014), p. 57.

[28] Gordley (1993), p. 9 argues that modern-day legal doctrines were founded originally on the same philosophical ideas; Markesinis et al. (2006), p. 2 note that the underlying basic principle of both legal systems is the free market system, and thus their roots are economically tied to the same market ideology, although later developments might vary.

[29] Buckland et al. (1952) suggest that the practical rules of Roman and common law show astonishing similarities.

One of the main reasons for such historical heritage is that Rome, due to its span across cultures and territories, was successful at ruling large populations, which made its law more easily applicable universally.[30]

However, similarities in historical origins do not necessarily translate into the practical and legislative developments later down the temporal line. So, it is crucial to assess the similarities and differences between the contractual mistake doctrines of English and German law using the functional method of comparative legal analysis, which focuses on the problem that the legal instruments in varying legal systems are trying to resolve rather than the instruments themselves.[31] However, the plain consideration of the doctrines is not enough for the comparative legal analysis, and there should be a common characteristic determined by the epistemic interests of the research, which will serve as the common denominator (*tertia comparationis*).[32]

Since the aim, and thus the epistemic interest, of the current research, is to propose a working framework for AI-made mistakes at the end, *tertia comparationis* for the contractual mistake doctrines in English and German law is the characteristic of the underlying mistake rather than its legal operativeness regime. Thus, the comparative analogical inquiry into the respective mistake doctrines is made to understand the law by enhancing the knowledge about the categorization of the mistake types[33] and proposing a general categorization for mistakes applicable to both legal systems.[34] This consideration can be seen as an attempt at systematization—an important step in the functional method of comparative legal analysis—which allows one to devise a more wide-meshed understanding of the mistake phenomenon and propose a unified classification that will embody the mistake types under both legal systems.[35]

1.2.2 Interdisciplinary Methodology

However, a pure legal consideration of the topic of contractual mistakes will not deliver sustainable results for the proposition of the framework for AI-made mistakes and thus requires a thorough consideration of other relevant disciplines, such as psychology and computer science.[36] An interdisciplinary approach can yield a better understanding of the phenomena found in the border of multiple sciences, such as the cases of mistakes and help construct a more theoretically grounded framework

[30] Burdick (2012), pp. 1–2.
[31] Zweigert and Kötz (1996), p. 33.
[32] Örücü (2006), p. 442; Nils (2006), p. 317.
[33] Danneman (2006), p. 405.
[34] Samuel (2014), p. 60.
[35] Zweigert and Kötz (1996), p. 44.
[36] Larenz and Canaris (1995), p. 16.

for AI-made mistakes.[37] Thus, a psychological inquiry is necessary to establish to what extent the mistakes that occur in the contract formation process of humans can be justified through the lenses of contemporary psychology.[38] On the other hand, the mistakes that AI can potentially make while concluding a contract autonomously can only be theoretically identified and comprehended by taking a technical approach to the issue. Thus, the current research uses the following interdisciplinary methods for achieving its aim:

1. *Validating* the applicability of the psychological notions, such as the human decision-making process and human error, to the legal phenomena, such as the contract formation process and contractual mistakes.[39]
2. *Deriving* commonalities based on the analysis of psychological and technical events, such as the decision-making process and errors of humans and AI.[40]
3. *Exemplifying* various contract formation situations to determine the admissibility of the interdisciplinary analysis made throughout the research to propose a common framework for AI-made mistakes.[41]

It should be noted that the current research does not use empirical legal research methodology since the latter concerns mostly the use of quantitative methods to evaluate or prove legal phenomena.[42] What on the other hand the current research does, is incorporating general scientific methods into legal thinking,[43] and thus testing various theories to determine whether they are logically and scientifically sound.

1.2.3 Structure of the Research

The current work consists of four chapters. Chapter 2 describes the historical development of the contractual mistake doctrine starting from the ancient Roman law and continuing to the nineteenth century legal treatise writers of English and German law. It considers the parties' intentions as a necessary legal prerequisite for effective contract formation in both legal systems. At the end of Chap. 2, respective contractual mistake doctrines are considered, and an attempt is made to introduce general mistake categories. Chapter 3 inquires into the psychological foundations of human decision-making in the contract formation process on the example of Ernst

[37] Michaels (2006), p. 342.

[38] Larenz and Canaris (1995), p. 118; Samuel (2014), p. 23 recognizes that cognitive psychology can shed light on fundamental questions of law, especially from a comparative perspective.

[39] Michael (2018).

[40] DiSalvo (2018).

[41] Gisler (2018).

[42] Siems (2009), p. 10.

[43] Siems (2008), p. 162.

Zitelmann's theses and the nature of the errors that occur within that process. As a result, human error classification is considered a plausible criterion for classifying contractual mistakes. A technical overview of AI and the doctrinal questions its use for autonomous contracting purposes raises in English and German law are discussed in Chap. 4 to familiarize the non-technical readers with the terminology and concepts used further in the research. Chapter 5 starts with the comparison of the contractual decision-making process of humans and AI, as well as the potential errors that tend to occur within this process. Subsequently, based on the above findings, the common framework for AI-made mistakes in contract formation in English and German law is proposed, whereas the necessary flexibility is left to both legal systems to adapt the framework to their legal needs and tradition.

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Chapter 2
The Mistake Doctrine in German and English Contract Law

A mistake made in the process of conclusion of a contract enables the mistaken party to free himself from a declaration of intent or promise unless certain conditions have been fulfilled.[1] It would be reasonable to conclude that it is these certain conditions that are essential for discussing mistake doctrine and not what was or is considered a mistake in a legal sense. However, no doctrine can be fully understood without the historical chronology of its development and the ideas manifested behind its canons. It is suggested to start this chapter with a historical introduction to the contractual mistake doctrine taking its roots from ancient Roman law and reaching its peak in eighteenth–nineteenth centuries when the legal treatise writers, jurists, courts, and legislators were confronting serious challenges, especially in instances vitiating consent in contract law.

In the early stages of the development of law, the prevailing view was that in a legal system where the contracts are to be enforced, no relief was given to the mistake made by either party.[2] This philosophy of the law taking its roots from the well-established principle of sanctity of contracts (*pacta sunt servanda*), shifted from barring all and every kind of mistake in contracts to being more flexible in allocating the right of rescission to the mistaken party. Along the lines of positive reforming of the legal doctrines to mitigate the effect of mistake, there has always been ongoing tension between different underlying principles of contract law: risk-shifting, the security of transactions, and rewards to knowledge, skill, and diligence.[3]

Armed with those precursors, legal systems took different paths in devising an actual mistake doctrine and let the mistaken party avoid or rescind[4] its declaration of

[1] Schermaier (2005), p. 39.

[2] Fuller (1984), p. 41.

[3] Eisenberg (2003), p. 1576.

[4] Terms "avoidance" and "rescission" will be used interchangeably, since they describe the same process, the first being a prevailing translation from German term "*Anfechten*" in academia, and the second being a legal term used in English law. For more, see O'Sullivan (2000).

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intent or promise respectively. Although both German and English law recognises the intention to contract as a prerequisite for an effective contract, the approach to a contractual mistake concerning that intention is not uniform. German law divides mistakes mainly according to the aspect of a declaration of intent that the person is mistaken about, whereas English contract law is less clear in its division, as one might expect from a non-codified legal system, and classifies mistakes according to the number of parties who made a mistake. Thus, a mistake mutually shared by both parties is a common mistake, and a mistake committed by only one party is a unilateral mistake. Given that this research analyses possibilities of applying mistake doctrine to the contracts concluded by autonomous AI and not analysing the whole doctrine in the digital age, only the unilateral mistake in English law will be considered.

In English contract law, mistake doctrine is ambiguously regulated between law and equity to add to the complexity.[5] However, the purposes of the current research need the analysis of the development of mistake doctrine in courts of law rather than in courts of equity because the latter was mainly concerned with assessing the fairness of the case and allocation of equitable relief where law failed to do so.[6] Given the distribution of the English mistake doctrine across the non-unified umbrella of cases, the mistake types will be classified based on their common characteristics. This would allow comparing relatively similar mistake types in both legal systems and present general mistake categories of mistakes.

2.1 Historical Development of the Mistake Doctrine

Mistake doctrine underwent multiple rounds of polishing since its foundation in ancient Roman law, given its controversial character. Mostly shaped by the legal scholars and treatise writers of various periods of history, all the way until the nineteenth century, mistake doctrine presents a unique opportunity to assess the development and the impact of the theoretical coordination between conceptually different legal systems. Both common law and civil law mistake doctrines can be traced back to their roots in Roman law. However, due to legal-cultural differences, each took varying approaches.

[5]The English law of equity will not be discussed, since it operates to a limited extent in mistake cases and intervenes only to correct hardship that might result from the narrow notion of mutual mistake of the parties. For such a discussion, see Patterson (1928); Abbot (1910); Story (1853), pp. 123–204; Lubbe (2006), p. 463.

[6]Fry and Scott (1884), p. 361 "Mistake may be of such a character as, in the view of a purely common law court, to avoid the contract on the ground of want of consent. . . But equity requires still more than that the contract should be merely legal. It must not be hard and unconscionable, i.e. it must be free from mistake, for where there is mistake there is not that consent which is essential to a contract in equity".

2.1.1 Ancient Roman Law

The emergence of mistake doctrine can be traced back to Roman law, as enshrined in the Digest[7] of Justinian.[8] As the Roman Empire grew to be more prosperous than a simple agrarian society and have much more sophisticated commerce turnover, doctrines regulating contractual obligations and agreements were being brought up by compilers of *Corpus Iuris Civilus* to meet the challenges.[9]

In ancient Roman law, only the declaration counted, and there was an irrebuttable presumption that the parties' will was correctly and adequately reflected in the contract.[10] It must be noted that because the Romans had a "law of contracts" rather than a "law of contract", it is difficult to outline with precision what the Roman law of mistake was.[11] The four consensual contracts in Roman law that developed due to the economic necessity and increasing number of commercial transactions were *emptio venditio* (sale), *locatio conductio* (hire), *societas* (partnership), and *mandatum* (mandate).[12] As soon as the consent was placed in the middle of the actionability of the contracts, Roman law was forced to allocate regulation where such consent was absent due to error on either party's side.[13]

In Roman law, the following types of mistakes were fatal for the outcome of a contract: mistaken transaction (*error in negotio*), mistaken identity (*error in persona*), mistaken subject matter (*error in corpore*) with the mistake as to the price (*error in pretio*) and as to some qualities of subject matter (*error in substantia*) being runner-ups.[14]

Mistake as to the legal nature of the concluded transaction (*error in negotio*) is a concept that later commentators developed, but one can still see the traces back in the Digest of Justinian.[15] Paul brings an example of money given as a gift and is accepted as an obligation to pinpoint the principle that the parties' intentions need to coincide for a lawful obligation to arise.[16] Julian seems to adhere to the principle when differentiating between loan and gift and holds that importance needs to be given to the parties' actual intentions.[17] The most radical formulation is presented by

[7] All the translations of the Digest of Justinian are taken from: Watson (1998). Further citations of the Digest will omit reference to this translation, and will be presented in the format "D book, part, paragraph, sentence".

[8] Zimmermann (1992), p. 587.

[9] Wauters and de Benito (2017), p. 12.

[10] Zimmermann (1992), p. 587.

[11] Buckland (1912), p. 286.

[12] Burdick (2012), p. 442.

[13] MacMillan (2010), p. 16.

[14] Du Plessis (2010), pp. 255–256.

[15] Mousourakis (2015), p. 193.

[16] D 44.7.3.1.

[17] D 12.1.18.1.

Pomponius, who regards any misunderstanding between hirer/buyer and seller/lender as material for mistake evaluation.[18]

Mistake about the identity of the other contracting party (*error in persona*) was only operative to the extent that the other party's identity was of material significance to the mistaken party.[19] However, it is not distinctly visible from the texts of Justinian that such an error[20] was given separate consideration. Ulpian, touching on the issue from the criminal law aspect, mentions that if A misrepresents B to C as being a very reputable person, and C lends money to B on a mistaken belief, then both A and B are liable for theft.[21] In a loan agreement, an *error in persona* would likely render a contract void, which would not have been concluded but for the error.

Error in corpore in Roman law refers to the mistake as to the identity of the thing which was the object of the contract.[22] For Ulpian, all that mattered was *putara emere* and *putara vendere,* the buyer's and seller's intentions accordingly. He describes the buyer's situation, assuming he is buying Cornelian farm, and the seller assumes he is selling a Sempronian farm. Here, there would have been no sale if the object of the purchase was not there for the inspection (later, he gives the same example with the slaves).[23] According to him, mere disagreement over the name of the object sold (*error in nomine*) is not a ground for rescission of contract based on *error in corpore*.[24]

One mistake did not make it to the distinct essential mistake category but still had seen quite an extensive doctrinal development in Roman law. Regarding *error in pretio*—a mistake as to the price of the object of sale, Ulpian holds that the purchase is not valid if there are disagreements over the price.[25] However, there is one peculiarity when the disagreement is material for the invalidation of the sale—if the seller thinks the price is agreed to be 5, and the buyer agrees to pay 10, then the sale is valid for the price of 5. The reason is that the buyer's willingness to pay a higher amount also includes his[26] willingness to pay a lesser amount.[27] Theoretically, the same argumentation can be made for the opposite case, where the seller thought he had contracted for ten and the buyer thought he had promised to pay five.

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[18] D 44.7.57.

[19] Mousourakis (2015), p. 193; also, see MacMillan (2010), p. 17.

[20] Term "error" and "mistake" will be used interchangeably in this chapter—"error" referring more to the archaic language found in Roman law books, and "mistake" being a newer implementation of that term in the legal systems.

[21] D 47.2.52.21.

[22] Zimmermann (1992), p. 590.

[23] D 18.1.9.

[24] D 18.1.9.1.

[25] ibid.

[26] Gender-specific terms may be used throughout the current work in order to ease the readability. However, it should be understood as referring to all genders, unless explicitly stated or referred to an author.

[27] Zimmermann (1992), p. 591. This approach can also be seen with regards to the mistake in the quantity of the subject matter (error in quantitate) in D 45.1.1.4.