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# GUARANTEE THE GENETIC DAMAGE RESULTED FROM THE PEACEFUL USE OF ATOMIC ENERGY: (COMPARATIVE ANALYTICAL STUDY)

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**Abstract**

The first approach is the laws of criminalization the medical intervention that compromises the integrity of the human genetic map unless the purpose is therapeutic. As for the second approach, it subjects any cause of harm (a harmful act) affecting the genetic formation, to responsibility for its illegal action, which is relating the damage that occurs to the human genome outside the contractual relationship, especially the damages resulting from the harmful act resulting from the peaceful use of atomic energy, which is the subject of the current study. The study scope is determined in identifying the legal problems raised by the subject of the human genome and its genetic map as an attempt to reach legal solutions to them, whether by referring to the traditional legislation in civil law, and if the latter does not meet this, new legal rules are adopted that are consistent with the special nature of the information included in the genetic map.

## INTRODUCTION

### *A general idea of the study essence:*

With its significant impact on the map of the human genome and the damage it causes, the genetic damage resulting from the peaceful use of atomic energy is one of the most important multiple damages that affect the genetic map outside the scope of the contractual relationship. The legislator has taken two approaches to protect the human genome, because it constitutes the basic foundation of the human personality with its biological characteristics linked to distinguishing the person's self and the infallibility of his body. The first

approach is the laws of criminalization the medical intervention that compromises the integrity of the human genetic map unless the purpose is therapeutic. As for the second approach, it subjects any cause of harm (a harmful act) affecting the genetic formation, to responsibility for its illegal action, which is relating the damage that occurs to the human genome outside the contractual relationship, especially the damages resulting from the harmful act resulting from the peaceful use of atomic energy, which is the subject of the current study.

***The Problems**:*

In order to define the legal basis that regulates the provisions of the human genome map, it is important to stop at the problem of determining the legal nature of the human genome map, which will pave the way for resolving legal problems raised by the subject of the human genome and its genetic map represented by three axises: The first is the relationship between the human genome map of an individual and the medical interventions that are made. The second is the extent to which the information derived from the genome map can be used in the field of civil or criminal evidence. As for the third, it is the relationship of the human genome map to legal responsibility, any attack by third parties against a person's right to the integrity and safety of his human genome arises from it criminal and civil liabilities. The most prominent case of abuse of the human genome is exposure to radioactive materials used for peaceful purposes of atomic energy that affect the genetic formulation of the individual, leading to congenital malformations in his later generations or progenies.

***The study scope**:*

Is determined in identifying the legal problems raised by the subject of the human genome and its genetic map as an attempt to reach legal solutions to them, whether by referring to the traditional legislation in civil law, and if the latter does not meet this, new legal rules are adopted that are consistent with the special nature of the information included in the genetic map.

***The study purpose and importance**:*

Is to fill the legislative gap and create a legal system, an alternative to the traditional systems. As well as recognizing the legal nature of the human genome and its genetic map and the relationship between the latter and the tort liability in order to prepare the legal protection of the genetic map of the human being from the harms of the peaceful use of atomic energy, which leads to the change of the phenotype of the human being (Phenol type) and the protection of the interest of society, which leads, as a result, to change the genotype of the human race in general. We hope that this study will be a stepping stone to drafting an integrated Iraqi legislation that regulates the legal aspects of the human genome as it is the most important discovery in the twentieth century.

***The study methodology and plan**:*

A comparative analytical approach was followed, combining induction and deduction. In order to cover the study goal which is guaranteeing the harm of the affected person resulting from the harmful act that affected the genetic map of the genome, the research was divided into four topics. The first topics examined the legal nature of the human genome map, while the other three topics dealt with the tort liability' (guarantee) elements: error, damage and causal relationship. The second topics examined the error that led to the occurrence of the damage in the genome map, while the third topics concerned with the damage resulted from this error that affected the genome map and the importance of this element in establishing the tort liability (guarantee). The fourth topic went to the establishment of the causality relationship between error and damage. The research was concluded with the most important findings and recommendations that emerged from the study.

## *The first topic*

## *The legal nature of the human genome*

The legislator should not drop or neglect the scientific experiments resulting from the accelerated scientific progress, so that the scientific efforts would not be unregulated or unrestricted, so the legal rules expressing the meaning of the human genome were established. Jurisprudence, with the support of the judiciary, tried hard to discover the legal nature of human genome. The opinions of jurists focused mostly on ascribing this nature to the right to privacy. A Man has his own human genome that carries his genetic map, and there is a mechanism by which his traits and characteristics are transmitted to future generations. Dr. Al-Kuwaiti(1) defines the human genome map as a set of coded biological codes that reveal the biological characteristics and attributes of an individual that distinguish him from others, regardless of the degree of kinship between him and them. Every individual has genetic information, a right that stems from his right of privacy as the genetic map forms the inner side of the person's personality, and some of them described this right as the genetic privacy right. A part of the French jurisprudence support that, in defining the right of privacy as that every human being has a scope or a field in life; must be personal and limited to him, no other person is allowed to enter it without permission(2) The rights that the law grants to the human being, financial rights such as personal and real rights, and non-financial personal rights, perhaps the most prominent of which is the right of the human being to distinguish himself socially by taking a personal name(1). The map of the human genome appears to be part of the personality and its characteristics, which harmonies with Iraqi legislation and with some views put forward in the German judiciary (2). By the foregoing it appears: the deviation of the individual right of the infallibility of his body, to the map of the human genome and the consequent legal provisions related to this map, as it is a part that could not be cut from the human body and his physical entity, and it is a copy of the individual right in his physical being infallibility.

## *The second topic*

***The Error***

To guarantee [3] the damage for the harmful act that affected the genetic map of the genome, it is necessary to have this responsibility (guarantee) elements including error, damage and casual relation between error and damage, so the subject of this topic was error, that is, the first element of the establishment of tort liability, an error that causes the harm or the damage resulted in the emergence of the genetic damage. The provisions of this responsibility are either determined by the criminal law, this is criminal liability, or civil law, this is civil liability, and the last one whether it arises from a breach of an obligation arising from a contract and this is the contractual liability or for an act that causes harm or damage to others, that is, outside the contractual relationship, and this the tort liability for illegal act, which concerns us in this research. Within the scope of tort liability, the English law approved a group of unlawful acts that are based on the idea of negligence, which are represented in the Iraqi civil law acts of rape, destruction and assault on persons and include acts of killing and wounding of individuals and public and private harm[1]. However, the English law called for the necessity of adopting strict liability (Strict Liability) as a basis for liability (guarantee) for the damages inflicted on the human genome resulting from the peaceful use of atomic energy. And the rule that must be followed, according to what was called by the English jurists and the English judiciary, in the legislation is that any person brought or gathered something for his benefit and this thing could cause harm to the other if it escaped or leaked (Does mischief if it escapes), then he must take the necessary precautions otherwise, he shall be held liable for presumptive liability for damages that are a natural consequence of this outflow or leakage. In this direction, the English legislator has acted according to the atomic energy legislation issued in 1954 and the legislation issued in 1959, establishing this responsibility on the basis of strictness, moving away from the idea of neglect[2] where Article (3) of Chapter One of 1954 Legislation( the Atomic Energy Authority Act) stipulates that: ((The authorities supervising the atomic institution must ensure that no radioactive materials leak from the atomic institution or its accessories under their possession or any nuclear waste whatsoever its appearance if its leakage may cause harm to people in their bodies or properties, and it is equal that these persons are working inside or outside the atomic institution)). In the same vision and orientation, the legislator proceeded in 1959 legislation - the Unclear Installation- Licensing and Insurance Act - Article (1) From Chapter One in "In all cases in which a permit is granted to exploit an atomic site, the authorized person must ensure that there are no ionizing materials that may have been leaked during the period in which the person is subject to liability, whether these materials are in such form or in the form of radioactive materials, and he is also responsible for the leakage of radioactive nuclear fuel during its transportation to and from the atomic institution". In addition, the Royal Commission on Civil Liability and Personal damages has been heavily responsible for programs and projects, and applies it to specialized activities in which risk emerges with a high degree of clarity [1]. American jurists have protested, in establishing strict liability for unlawful action in negligence, that the atomic facility inflicts a great deal of dangers that its impact extends beyond the surrounding geographical area to include large and vast areas, as

well as the enormity of the damage it causes. Based on the foregoing, the legislator in America had founded for liability for unlawful work for damages resulting from the use of atomic energy, in legislation Price Anderson Act1957, basing on the strict liability, thus taking the same steps advocated by the English jurists and judiciary, and the approach of the English legislator.(2)

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***Third Topic***

***The Damage***

Damage is the most important element of responsibility as there is no responsibility if there is no damage. It is damage who gives the right to compensation, and he who justifies the ruling by it, not the mistake. It is not sufficient that there is a mistake in the determination of responsibility, but rather harm must arise from the mistake. The harm is of two types, material and moral. Material damage (3) is what afflicts an individual in his money or himself, or in one of his rights, or in the interest of his project for him, in other words it is what afflicts a person in one of his financial rights.

Moral damage is what afflicts a person in his feeling and affection, in his dignity, in his honor, or in other matters of moral importance, in other words, it is what afflicts a person in a non-pecuniary rights(1).It seems that the English law jurisprudence divided damage into two types: pecuniary damage and non-pecuniary damage, and this jurisprudence did not adopt the term of the physical damage, within the material damage that afflicts the individual in himself, but went to the fact that bodily harm sometimes is pecuniary as in the loss of the ability to earn or non-pecuniary damages or moral as in the aesthetic damage that affects the individual as a result of using atomic energy during the course of the study(2). Damages arising from the peaceful use of atomic energy are inflicted on either the individuals working inside the mortgage facility or the individuals outside it, or both. These damages vary according to the nature of the individual exposed to radiation; the most apparent type, including what affects the human genome of the affected individual (exposed to radiation), which leads to harmful changes (to harm him) to his genetic map. The study finds from the foregoing that it is very important to determine some of the characteristics of genetic damage that are characterized by several characteristics, perhaps the most important of them:
**First/**Since it affects the individual in his genetic map, which is one of the most important foundations of personality, then he is considered a physical harm (3)because it afflicts that who suffers hereditary diseases, including blood cancer, thyroid gland cancer and other diseases affecting the lens of the eye, as well as other diseases that have a negative impact on reproduction, as it leads in cases of severe exposure to sterility(4).

***Second***

Genetic damage is characterized as recurrent damage, that is, damage that occurs to someone other than the direct victim of the harmful act (5) The study supports what Dr. Sulaiman Markus said, in that it is considered personal damage to those it have recurred (1). It does not violate the human right of

solitude and integrity of his genetic map only, rather, it extends to his offspring after him, such as their mental deficiency or lack of head circumference[2], in more precise terms that the irresponsible's mistake - in the case of atomic hazards - violates the right or legitimate interest of the child, which is the unity and integrity of his genetic map, this damage is a recurrence or a reflection of the damage that affected the person who gave birth to him[3].The study finds that genetic damage, as a recurrent damage, besides infringing on the human right of the integrity of the human genome (his genetic map), it goes beyond that to his children after him, such as their mental deficiency or lack of head circumference. In other words, the damage resulting from using the atomic energy infringes the damage caused to the child's right or legitimate interest represented by the safety of his human genome (his genetic map), and that this damage is a reflection of the damage suffered by his parents. The Iraqi legislator referred to the recurrent damage in showing the cases in which the accident leads to the death of the injured. This was mentioned in Article (203) of the Civil Code: "in the case of murder and death due to the wound or any other harmful act, the person who caused the damage shall be responsible for compensating the persons who were the dependents of the injured and were deprived of dependence because of murder or death." In Article (2/205) of the same law he permitted "to decree compensation for spouses and relatives of the family for the moral damage that they suffer as a result of the death of the injured [4].From the foregoing, and according to the characteristic of recurrent damage, two types of lawsuits appear before the damaged party in order to obtain the appropriate compensation, to repair the damage resulting from this exposure to the understudying use and restoring its economic balance, from the real cause of the damagethe holder of the atomic facility, as the responsible for the original and recurrent damage caused to the affected person as a result of the peaceful use of atomic energy; they are the suits of the first damaged person( the original) and his sons after him.[1] According to this principle the judiciary confirms that the damage affects a certain person may results in another damage that befalls other individuals of his direct progeny, thus generating a personal right of compensation for him independently and distinguish basing on the recurrent damage rather than the original one[2].The summary is that the origin is that compensation is obligatory for who affected with the material and the moral damage. Law does not have any text that prevents someone other than the person who was the victim of the harmful act from claiming compensation for the damage he suffered as a result of this act[3].

***Third***

There is no doubt that the atomic radiation resulting from the peaceful use of atomic energy in the majority is not determined within a specific geographical area, which is called the spatial circumstance, rather that its effect extends spatially to vast and wide areas, representing thousands of kilometers. Accordingly, it can be said that the geographical area in which the damage occurs and the effects of genetic damage arising from the hazards of atomic energy are international [4].

***Fourth***

The genetic damage takes a long time, that it is characterized by being permanent in terms of time; the effect of atomic radiation resulting from this peaceful use continues for long periods, which raises issues that are subject to dispute in the field of the case's statute of limitations and the time that is legally permitted for its establishment besides the applicable law [(5)]

***The Fourth Topic***

***The Causal Relationship***

To achieve liability, for damages resulting from the peaceful use of atomic energy, it is not enough to have an error and a damage, but the damage must arise from the error, that is, that the causal relationship between the error and the damage is established, so the error is a cause and the damage is a effect, if there is no casual relation, there would be no liability. This causal link is interrupted by two things, the first is if the foreign cause is the one that caused the damage, and then it must (exclude) the fault of the perpetrator of the damage. And the second if the damage was not a direct result of the errorthat is, if the damage is indirect [(1)].So, that who had damaged genetically, by exposing to the radiation resulting from the peaceful useof atomic energy, would have the suitable compensation by which he can repair the damage,if he initiateprove that the damage he suffered is a result of exposure to radiation (radioactive materials) resulting from the peaceful use of atomic energy. Then he had to prove that these radioactive materials have leaked from a specific atomic facility. It seems that the nature of the characteristics (i.e. the characteristics of genetic damage) constitute some difficultiesfor the establishment of the causal relationship between cause and effect, and consequently, these characteristics prevent the genetically affected from obtaining compensation that repair his damage and restores his economic balance as it was before exposure to radiation resulting from the peaceful use of energy.As we note in the previous topics concerning the characteristics of genetic damage; of these characteristics, which constitute an obstacle to the victim todemand for adequate compensation [(2)]:The genetic damage appears after a relatively long time from the exposure of the victim to the radiation resulting from the use under study, i.e. The genetic damage signs and symptoms take a long time to become apparent.

A person exposed to radiation of these materials can get rid of it very slowly, it may settle in the human body throughout his life to spread to his entire body, which is the so-called cumulative effect of the damage resulting from exposure to radioactive materials.

1- In addition to the aforementioned characteristics of genetic damage, the similarity or convergence of traits between the radioactive effect, the thermal effect and the chemical effect constitute another obstacle in addition to the above obstacles, resulting from the difficulty involved in the possibility of separating the mentioned above effects.

2- In order to facilitate the damaged person in his endeavor, to obtain adequate compensation for the damage he had suffered; a jurisprudential

approach established responsibility, assuming the error. In most of the modern techniques, the legislator responded to this important trend, thereby removing from the shoulders of the claimant the burden of proving the error of the damage committer (the responsible), making it easier for him to obtain reparation for the damages. However, the person responsible for the damage cannot pay this responsibility except proving the foreign cause. It is not sufficient for him that he did not commit error by himself;because everyonewas responsible for something that requires special care to prevent harm or damage, would be able to deny his liability for the damages resulting from that thing, as it is proven that he took sufficient care to prevent the damage(1). Therefore, the German judiciary, supported by a side of jurisprudence, went to consider the affected or the damaged side, establishing a judicial presumption(evidence): if an individual suffers genetic damage resulting from exposure to radioactive materials resulting from the peaceful use of atomic energy from a particular facility, then the action of the latter would be the effective cause of creating the damage, so(the atomic facility that causes the damage) has the burden of proving what contradicts this presumption (evidence). That is, the aforementioned judiciary adopted the course of the assumed error that subject to provingthe opposite, the course that the Iraqi legislator has followed in its civil law and the majority of the judiciary, while the French legislator considered the assumption of error a formal and final, that is, it does not subject proof of the opposite (1)

It appears from the foregoing that: the legislator transferred the burden of proof from the responsibility of the affected or damaged to the responsibility of the one who is responsible for the damage and empowering the latter, denying his responsibility by proving that he does not commit a mistake, if the legislator adoptsthe assumed error that subject to proving the opposite. Moreover, he can avoid the liability if he proved that the damage occurred due to foreign cause (2).The study finds: In both cases, the affected person, due to exposure to radioactive materials as a result of the peaceful use of atomic energy, will lose the opportunity to obtain the appropriate compensation that helps in repairing his damage restoring his economic balance, which means that the affected person will struggle and suffer alone from his damage.

The summary is:

* The research tends towards the legislator adopting the normal and traditional path of tort liability to ensure the genetic damage resulting from the peaceful use of atomic energy, by compensating the damaged person with an adequate and just compensation to repair his damage, that was compatible with the dangers to which the individual is exposed at that time in certain social and economicsconditions, so we find few cases in which the affected person cannot obtain appropriate compensation with specified amount within the personal error course.

* In light of the electronic informational development since the middle of the twentieth century, with the increasing number of dangers and hazards to which individuals are exposed, as well as the exacerbation of pollution problems and the problems of atomic energy and its peaceful use, Man used to coexist with a

tangled wave predicting upcoming dangers, it seems thatfollowingtort liability can cover the imminent risks and the resulting compensation for those affected persons.

## CONCLUSION

After the researcher has dealtwith the topics of the study according to its plan, some results and recommendations have been nominated, in order to complete the scientific purpose, and are listed as following:

***First/ The results:***

- Some scientists find that the right to dispute revolves around with life, existence and absence, while the information contained in the human genome map remains close to humans and do not leave him, no matter how long it takes.
- There is nothing in the law that prevents someone other than the person who was the direct victim of the harmful act from claiming compensation for the damage he suffered as a result of this act.
- Everyone has his own genetic information, a right that stems from his right of privacy, as the genetic map forms the inner side of his personality.
- Genetic damage not only violates a person's right of the integrity and safety of a genome map it also extends to his progenies after him.
- The judiciary took the course of the assumed error that can prove the opposite, especially with the responsibility for the genetic damage caused by radioactive materials for the use of atomic energy, which is what the Iraqi legislator has adopted; it transferred the burden of proof from the shoulders of the affected person to the one who is responsible for the damage and enabling the latter to deny responsibility.
- It seems that following the traditional system of tort liability does not cover the imminent risks and hazards and the resulting compensation for the affected person. Accordingly, the damaged person cannot obtain adequate compensation.

## RECOMMENDATIONS:

- We hope that the legislator will seek new means that create an appropriate situation to ensure the compensation for the affected person, by organizing new compensation legislation based on the principle of distributing risks and responsibilities in a comprehensive manner, especially compensation for damages resulting from the Peaceful use of atomic energy.
- It is very important for the legislator to realize the urgent need to expand the concept of recurrentdamageto include the understudy genetic damage under discussion.
- The legislators are called to upgrade the legal protection of the integrity and safety of the human genome map, to the level of a constitutional text.
- We hope the legislator, especially the Iraqi legislator; begin issuing special legislation dealing with the human genome, taking into account the international agreement.

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