Advances in Social Science and Culture
ISSN 2640-9682 (Print) ISSN 2640-9674 (Online)
Vol. 7, No. 6, 2025
www.scholink.org/ojs/index.php/assc

Original Paper

The Dilemma and Transformation of Paternity Testing from the Qing Dynasty to the Republic of China—Focusing on Blood Kinship Testing

Zihao Wu[1]

[1]Zhejiang Normal University, Jin'hua, Zhejiang, China

Received: August 22, 2025 Accepted: October 29, 2025 Online Published: November 14, 2025

doi:10.22158/assc.v7n6p42 URL: http://dx.doi.org/10.22158/assc.v7n6p42

Abstract

Paternity testing is intertwined with kinship, morality, politics, and economics, and was indispensable in ancient China. Through practice, the ancients developed the blood-drop paternity test, forming a self-consistent mythological narrative that persisted into the Republic of China era. By the Qing Dynasty, intellectuals had questioned the rationale behind this practice. The introduction of Western medicine, based on modern science, further challenged its validity, while the new technological myth was constrained by ethical dilemmas. This article focuses on the blood-drop paternity test, examining its evolution and challenges from the Qing Dynasty to the Republic of China period, and exploring its significance in the history of science and technology and socio-cultural history.

Keywords

paternity testing, blood kinship testing, technological transformation, technological dilemma

1. Introduction

Paternity testing is inherently linked to numerous aspects, including family economics and clan morality. Research on paternity testing technology involves various disciplines, such as biological science research, popular science education, law, and sociology. However, existing research often focuses on a single field, largely confining itself to a simplistic narrative of progress, with little dedicated historical study. This article aims to break away from this singular research approach by exploring the history of technology and socio-cultural history, broadening the perspective of paternity testing research, systematically tracing the development of paternity testing technology, and attempting to explain the reasons and processes behind the selection and rejection of blood-drop paternity testing, revealing the underlying knowledge games and the evolution of cultural and ethical significance. It

should be noted that the author is not limited to the late Qing and Republican periods; rather, a long-term narrative is intended, starting from the birth and application of ancient blood-drop paternity testing to the establishment of modern scientific and technological paternity testing, focusing on the important transitional periods of the late Qing and Republican periods and even after the founding of the People's Republic of China, showcasing the complex social context under the evolution of paternity testing technology. At the same time, it will also take into account the changes in mentality under technological transformation, and use sociological, hermeneutic, semiotic and other disciplines to further explore the mythologizing and demystification of blood kinship testing and strive to analyze the historical structure of technological transformation.

2. The Construction of Myths: The Authority and Continuation of Blood Test for Kinship

2.1 The Necessity of the Emergence of Technology and Traditional Chinese Appraisal Methods

The emergence and application of paternity testing technology is necessary. Firstly, confirming parentage is crucial to the inheritance of political status and power, forming the foundation of the patriarchal system. Secondly, confirming parentage involves property distribution; simultaneously, it embodies ethical and moral practices, with filial piety and benevolence embedded in the establishment of paternal relationships. Therefore, the parentage confirmed by paternity testing links political needs, the basis for property distribution, and ethical values, and the invention and development of related technologies have their own inherent logic. However, nothing is perfect. Throughout history and across the world, there have been cases where kinship was in doubt, involving individuals including parents and children, siblings, and even spouses; thus, testing technology arose in response.

In ancient times, paternity tests were mostly handled by the government, and officials often relied on inferences based on facts. During the Northern Wei Dynasty, Li Chong judged a case based on circumstances. Two people from different counties each claimed a child as their own. Li Chong lied, saying the child had died young. One person was overwhelmed with grief, while the other only sighed. Li Chong thus concluded the former was the true father. (Wei, 1974) During the Song Dynasty, Li Nangong judged a case based on reason. A widow remarried, taking her child with her. Her former husband's relatives came looking for the child, but the mother claimed he was not her former husband's son. Li Nangong, because boys usually lose their baby teeth at eight, and this child had lost his a year earlier, yet his mother claimed he was seven, awarded custody to the father's relatives. (Tuo, 1985) Li Chong's strategy can be summarized as the "common sense method," testing emotional reactions to uncover the truth; Li Nangong, on the other hand, used the "reason method," finding truth within common sense and logic.

In addition to this, ancient China also had a method of blood kinship testing—divided into two types: "blood mixing" and "bone dripping." The blood mixing method involved dripping the blood of the two individuals being tested into a vessel of water; if they mingled, they were considered relatives. The bone dripping method involved dripping someone's blood onto the bones of a deceased person; if the

blood seeped into the bone marrow, they were considered relatives. There are precedents for blood kinship testing during the Wei, Jin, and Northern and Southern Dynasties. For example, there was the case of Xiao Zong, the Prince of Yuzhang, testing his biological father. Xiao Zong suspected his biological father was not his ancestor, and "heard a popular saying that if the living blood is poured onto the bones of the dead, they will be father and son." Therefore, he exhumed the tomb of the Marquis of Donghun, dripped his blood into the bones, and then killed his own son, took his bones, and dripped his blood again, doubly testing the truth of the saying. The result was "verified," confirming that his biological father was indeed the Marquis of Donghun. (Yao, 1973)

The four methods of paternity testing in China are "common sense," "common sense," "bone drip," and "blood matching." In practice, the most accurate and reliable methods undoubtedly stand out, with "bone drip" and "blood matching" being collectively referred to as the blood drip paternity test.

2.2 The Mythical Narrative and Authority of Blood Test for Kinship

It is evident from the cases of Li Chong and Li Nangong, who respectively determined paternity, that in the process of identification based on common sense and reason, the decisive factor often lies in the personal qualities of officials and gentry. The confirmation of paternity stems from the logical reasoning of the judge, which is derived from the testimonies, actions, and emotional attitudes of both parties in the litigation, without forming a set of knowledge-based identification logic or institutionalized identification procedures. Blood paternity testing, however, is different.

Blood is naturally regarded as a bond of kinship. Terms like "bloodline," "flesh and blood," and "blood relatives" all embody the deep affection linked by blood. Blood ties were the order of ancient society. The signifier of "blood" was also broadened. In ancient times, the two parties who swore an oath of blood did not actually have a blood relationship, but after the ceremony, after drinking the blood, they formed a bond of kinship, becoming brothers. This ancient people's reverence for blood was the cornerstone of the blood-testing kinship system.

The veneration of blood has mythologized blood-drop kinship testing, but this alone is insufficient to establish its authority. The ritual of dripping blood during the identification process distinguishes it from legal and ethical methods. Like the ritualistic display of blood in sacrifices, the act of dripping blood has the power to instill trust in the examinee and the audience. The act of dripping blood onto bones or dissolving it in water for testing is itself a ritual, and the concept of "blood" and its religious connotations imbue the ritual with a magical quality. The blood test for kinship can be seen as a ritual myth. The blood test for kinship signifies kinship to the test subjects and helps them understand and accept it, regardless of right or wrong.

The blood-drop kinship test, requiring no government officials or forensic doctors present, was easily disseminated among the public due to its self-initiated nature, making it more accessible to the masses. In contrast, the bureaucratic method of using reason and emotion required a series of procedures, such as interrogation, deliberation, and conclusion. These procedures extended the time and space of the test, lacking the immediacy and witness ability of the blood-drop kinship test, further undermining its

credibility. In the blood-drop kinship test, whether the blood mingled or seeped became the key criterion for determining kinship. Therefore, compared to the reason and emotion method, the blood-drop kinship test was more "scientific" in ancient times.

The mythical effect inherent in blood-drop kinship testing has already surpassed other methods, giving it unique credibility. After Song Ci included blood-drop kinship testing in his *Collected Cases of Injustice Rectified*, its authority was officially established: "The method of blood-drop kinship testing states that if someone is a father or mother, and there are bones, and someone else comes to claim a son or daughter, how is this verified? Have someone prick themselves and bleed a little, dripping it onto the bones. If they are biologically related, the blood will seep into the bone; otherwise, it will not. This is what is commonly called 'blood-drop kinship testing.'" (Song, 2023) Blood-drop kinship testing thus embarked on a path of institutionalization, being incorporated into the ancient Chinese forensic medical system. Subsequently, blood-drop kinship testing gradually evolved into official technology. The Qing court devoted all its resources to compiling the *Collected Cases of Injustice Rectified*, published during the Qianlong reign, which standardized the knowledge of kinship testing in the Qing dynasty. A section of this volume retained Song Ci's "blood-drop" section, making it a standard technique practiced by Qing officials. This will both further promote the application of blood-drop kinship testing technology and strengthen the unquestionable nature of the technology with its authoritative credibility, but it will also put a constraint on the development of ancient kinship identification technology.

2.3 Questioning and Continued use of Blood-drop Kinship Testing in the Qing Dynasty

Song Ci's *Collected Cases of Injustice Rectified* has always been regarded as a judicial standard. The blood-drop kinship test technique has been further consolidated after being mythologized and authoritative, but voices questioning the accuracy of the blood-drop kinship test have never stopped.

Before the publication of *The Corrected Records of Wrongful Convictions of the Legal System*, Huang Liuhong had raised doubts: "The matter of blood dripping cannot be relied upon entirely. I have noted this here so that a wise person can decide whether to dismiss it." (Huang, 2018) Even though *The Corrected Records of Wrongful Convictions of the Legal System* included and preserved Song Ci's blood dripping technique, it also made a blood dripping test based on it, pointing out that fresh blood will always coagulate when it comes into contact with salt and vinegar, and that blood dripping to verify kinship is not a complete solution. Ji Xiaolan also recorded something similar: "However, I heard from old officials that 'blood from flesh and blood will always coagulate, which is normal. But if you place a vessel on ice and snow in winter to freeze it to extreme cold, or wipe the vessel with salt and vinegar in summer to give it a sour and salty taste, then the blood that is dripped into the vessel will coagulate immediately, even if it is from a close relative.' Therefore, a drop of blood is not enough to establish a reliable diagnosis." (Ji, 1980) Later, the *Xiangxue Congbian* (Collection of Hunan Studies) offered more angles of doubt: "There is also the method of blood coagulation by dripping water. However, according to Western medical books, the principle of blood coagulation varies depending on temperature, movement, smoothness, and humidity, as well as concentration." (Hunan Provincial

Education Inspectorate, 2012) The author specifically pointed out the effects of concentration; when there is more blood than water in the vessel, even the blood of a stranger can coagulate; when there is less blood than water, even the blood of a parent or child will not coagulate. Furthermore, he believed that bones have the property of attracting blood, therefore human blood could seep into the bones of pigs and sheep. The author explains the causes of blood coagulation from five aspects: cold and warmth, movement and stillness, smoothness and roughness, wind and atmosphere, and thinness and thickness, and refutes the claim that kinship is the cause of coagulation.

Wang Muyou, in his questioning, specifically applied knowledge of modern science. In his annotation of Wang Yu's *Wu Yuan Lu* from the Yuan Dynasty, he wrote: "For example, in the section on determining blood kinship, it says: 'According to the principles of modern science, hot blood dripping into flesh and bone can penetrate anyone, regardless of who they are. This is because bones contain electrical currents, which are heated by friction and absorb the hot blood. If the blood dripped is not hot, and the bone is not heated by friction, even relatives cannot have it dripped in. Therefore, the method of blood dripping is unreliable.'" However, one of the reasons he gave was precisely the explanation offered by Xu Lian and Shen Jiaben: "If blood dripping does not penetrate, it is because the method of drying is unknown." (Shen, 1985) In other words, after Wang Muyou proposed that electrical friction and temperature are the real factors determining blood penetration and that blood dripping for kinship testing is unacceptable, Xu Lian and Shen Jiaben took the temperature, which many scholars questioned, as a prerequisite, meaning that if blood dripping for kinship testing were to be used correctly, then the bones would need to be dried. Temperature was transformed from a questionable argument into reliable evidence, weakening Wang Mubo's doubts and providing a supplement to the blood kinship test. Electrical properties remained undisputed, and Shen Jiaben's selective elaboration reinforced the accuracy of the blood kinship test. Wang Mubo's insights seemed too weak, and the blood kinship test was still considered a viable solution.

In summary, some shortcomings of blood-drop kinship testing have already been discovered through historical practice. Even before the introduction of Western medical science and technology, there were internal doubts about the technique. This wasn't limited to learned figures like Huang Liuhong and Wang Mubo; as recorded in Ji Xiaolan's writings, officials and coroners involved in actual testing also discovered its inadequacies. Although the process and results of the technical verification were subject to certain variables, it was still included in the authoritative legal examination work, *The Corrected Records of Wrongful Convictions.* The publication of the *Law and Regulations Bureau* acknowledged the feasibility of this method, prompting its implementation—as an official technology. Blood-drop kinship testing became an official measure for officials to verify kinship. In other words, the underlying logic of blood paternity testing remains correct in mainstream understanding. The connection of bloodlines confirms kinship. However, due to various reasons, errors can occur in the practical application of this technology. This is precisely why blood paternity testing has been questioned. Investigating officials need to combine diverse evidence and avoid the interference of blood paternity

testing. Therefore, the blood paternity testing technique continues to be used.

In summary, blood-drop kinship testing was commonly used in paternity disputes and the identification of remains. When Li Hongzhang was ordered to exhume Kang Youwei's ancestral tomb, he stated in his memorial that "although there are no relatives present to identify him by blood," the ancestral tomb was confirmed based on oral testimonies from relatives and physical evidence found in the tomb. (Li, 2007) From the emperor to powerful officials, the authority of this official technology was recognized. Blood-drop kinship testing held a high priority, and if it was not available, other physical evidence could be used as evidence. If physical evidence was conclusive, blood-drop kinship testing was not necessary. Despite numerous doubts, without concrete physical evidence, Qing Dynasty officials could not escape the constraints of blood-drop kinship testing, representing a compromise. On the other hand, the lack of official authority in blood-drop kinship testing itself limited its further development, yet the technique was still used in the Republic of China era.

Therefore, the blood-drop kinship test has multiple reasons for its continuation, including technological, cultural, and political factors. Firstly, its inclusion in historical records such as the *Xi Yuan Lu* (Records of Injustice Rectified) and the *Law and Regulations Bureau Corrected Records of Injustice Rectified* institutionalized it, ensuring its continued existence as an official technology. Secondly, technological compromises meant that few other reliable methods existed besides blood-drop kinship testing. Thirdly, blood-drop kinship testing has become part of collective memory and is difficult to erase; the mythical narrative of blood ties enhances its credibility. Fourthly, due to the need for a stable ethical order centered on filial piety, the birth of a child outside the clan was considered a disruption of the lineage, making a successful blood-drop test a celebrated story. Finally, the continued use of blood-drop kinship testing, driven by the necessity of paternity testing technology, responds to the practical humanistic and emotional needs of finding and recognizing relatives. Before the myth of blood-drop kinship testing was dispelled, its function was also a necessary consequence of its existence.

Despite the multiple factors that underpin the blood-drop kinship testing technology, the skepticism it faces has not diminished, and opponents will point out its fundamental flaws from a more scientific perspective, ultimately making its abandonment inevitable.

3. Technological Reinvention: The Game between Blood Test for Kinship and Blood Type Identification in the Republican Era

3.1 The Birth of Paternity Blood Type Testing Technology

Before discussing the interplay between blood drop kinship testing and blood typing technology, it's essential to first examine the history of blood type discovery, which is also the prerequisite for the development of paternity blood typing technology. In 1900, Austrian scientist Karl Landsteiner discovered that the red blood cells of certain individuals agglutinated with serum. Through comparative experiments, he discovered the three blood types: A, B, and O. His students further developed this system by discovering a fourth type—AB—thus forming the first human blood type system. In 1930,

this naming principle was adopted by the Permanent Standards Committee of the World Health Organization (WHO), which named the A and B agglutinins anti-A and anti-B, respectively. (Jia, 2000) The ABO system was officially established.

More importantly, Dungern and Hirszfeld proved that human blood types conform to Mendelian laws of inheritance. Sergei Natanovich Bernstein further defined the exact mechanism of inheritance in 1925. (Wiener, 1948) This revealed the genetic relationship between offspring's blood type and their parents, making another avenue for paternity testing a reality, thus leading to the development of new technologies for blood type paternity testing. By the 1920s , blood typing technology was widely used for paternity testing abroad.

3.2 Introduction of Blood Type Identification

Technological advancements spread rapidly to China. In 1921, Chinese intellectuals somewhat dismissively pointed out that the blood-drop method used in the United States to determine paternity was considered a "latest invention" by modern Western medicine, while it was already recorded in China's ancient medical text, *The Washing Away of Wrongs*. (Liang, 1921) Two points are noteworthy here: First, if the method used in the United States was indeed a recent invention, it was undoubtedly blood typing, and information about the emergence and application of this new technology had already reached China; second, upon receiving this information, some people presumptuously claimed that China already possessed this method, mistaking modern blood typing technology for the Western version of blood-drop paternity testing—likely because the specific procedures for blood typing were not simultaneously introduced, reflecting their confidence in blood-drop paternity testing.

Conversely, skepticism regarding blood-drop kinship testing persists within academia. As early as 1913, some argued that while blood-drop kinship testing contributed to forensic medicine in the Middle Ages, it should now be relegated to the dustbin of history. (Yi, 1919) The author of this article merely asserted that abandoning the ancient method was inevitable, without explaining its flaws or pointing to new directions for kinship identification.

In the context of the eastward spread of modern forensic knowledge, these scholars who have embraced this new knowledge believe that blood-drop kinship testing is no longer sufficient to effectively determine paternity. Professors F. Oppenheim and Du Keming of Tongji University argued that blood-drop kinship testing is one of the errors in the historical text *The Washing Away of Wrongs*, pointing out that the methods of "blood mixing" and "bone dripping" are inapplicable, as the blood of any two individuals will inevitably mix in the container, resulting in agglutination. While discussing the errors in blood-drop kinship testing, Oppenheim and Du also pointed out that while modern forensic medicine can still determine kinship from a negative perspective, confirming a non-biological relationship, it cannot definitively establish a parent-child relationship. (F. • Oppenheim & Du, 1924) What Oppenheim and Du are referring to is blood typing. Although they explain its shortcomings, blood typing, based on modern science, is clearly superior to the much-criticized blood-drop kinship testing. The former is limited by the practical bias of positive results, while the latter is a substantial

error.

During the same period, Lin Ji, a pioneering figure in Chinese forensic medicine, made groundbreaking contributions to the introduction and dissemination of blood typing technology. In 1924, Lin Ji wrote an article detailing the methods of blood typing, explaining that this technology could be used for paternity testing and to help with blood transfusions for wounded soldiers on the battlefield. After studying in Germany, Lin Ji published more in-depth insights in 1926. He not only provided more detailed tables for study and reference but also explained the genetic basis of blood clusters, the invariance of blood clusters, and whether standard serum loses its sensitivity and ability to react, attempting to strengthen the trust of domestic readers. Subsequently, Lin Ji wrote many articles, each time adding new knowledge about blood typing. Through Lin Ji's efforts, the complete picture of blood typing was outlined and presented to Chinese scholars and the public. Although Lin Ji vigorously promoted blood type identification technology, he was also aware of its shortcomings, too many classifications and the difficulty in making definitive judgments with a single type of examination. He advocated for a multi-faceted approach to identification. First, studying the genetic characteristics of skin texture; second, paying attention to the time of conception and delivery; and third, examining the physical appearance of the parents, as children's appearances are inherited from their parents but also vary, allowing for comparison to verify parentage. Lin Ji applied all these examination methods simultaneously, making a comprehensive judgment to demonstrate the inadequacy of blood type identification. (Huang, 1995) In an era before highly accurate technology for paternity identification existed, and facing the societal demand for reform in forensic medicine, Lin Ji integrated knowledge from multiple disciplines to propose a more feasible identification method, a truly pioneering contribution. Lin Ji's method has also been applied in practice.

1932, the Institute of Forensic Medicine under the Ministry of Justice was officially established, and Lin Ji was appointed as its first director. He subsequently oversaw the founding of China's first publicly distributed forensic medicine journal, *Forensic Medicine Monthly*, which published numerous cases of examination conducted by the institute. Cases fourteen through eighteen are all paternity testing cases transferred from various regions to the Institute for further examination. Without exception, the institute first examined the subject's conception time and gestation period, making inferences based on common sense, and then conducted blood type tests to deduce the possibility of paternity, thus eliminating the unlikely paternity among multiple suspects. However, according to the laws of heredity, it was difficult to confirm that the subject was definitely the parent, so the institute also compared the subject's physical characteristics, including eyebrow length, nostrils, and ear shape, to compare the similarities and differences between the child and the parents. Combining the results of all the above tests, a conclusion was reached regarding whether the child was the parent. Case nineteen involved the identification of two packages of cremated bones, including whether the bones were human bones, the age of the owner, the time of cremation, and whether bone drip paternity testing was reliable. The examiners first dripped their own blood into the bones to be burned, then dripped human

blood into the bones of the animal being burned, and then dripped animal blood into the bones. They found that both human and animal blood could be dripped into either human or animal bones, thus proving that the bone-drip kinship test was unacceptable. (Lin, 1934) Therefore, the "mythical" bone-drip method was debunked.

3.3 The Game between Blood Drop Kinship Testing and Blood Type Identification

It believes that the 1930s were a crucial period of transformation for paternity testing technology. Blood typing technology was introduced at this time, and through the advocacy of intellectuals like Lin Ji, it shifted academic thinking. Simultaneously, intellectuals like Lin Ji also facilitated the establishment of new systems, further enabling blood typing. However, blood-drop paternity testing continued to be used.

Firstly, traditional forensic medicine held that experience was more important than theoretical knowledge. Veteran coroners, represented by Yu Yuan, insisted on using the knowledge derived from the *Collected Cases of Injustice Rectified*, based on experience, as their method of identification. He opposed the prevailing trend of favoring Western theories and attempted to inherit traditional classics such as the *Collected Cases of Injustice Rectified*, along with his own accumulated practical experience. Yu Yuan used this theory to train new coroners, thus ensuring the continued circulation of traditional forensic knowledge.

Secondly, there are economic factors. The appendix to the “Interim Measures for Identification and Testing” lists prices for paternity testing and genetic diagnosis at ten to thirty yuan, with individual serological tests costing even four to ten yuan. (Lin, 1936) Thirty yuan is enough to cover a family’s expenses for one or two months, making this testing fee a heavy burden for most lower-class people involved in paternity disputes. In contrast, blood paternity testing requires no special equipment or reagents, only a bowl of water and a silver needle, making the cost negligible. This stark economic disparity forces many people to choose the lower-cost, traditional method.

Furthermore, it believes that the simplicity and cultural inertia of blood-drop kinship testing still play a role. From an operational perspective, blood-drop kinship testing requires no professional laboratory environment or technical training; even county coroners and village elders can perform the procedure. In remote areas with inconvenient transportation and scarce medical resources, this simplicity makes it the only feasible option. From a cultural perspective, the concept of "blood kinship" is deeply ingrained in the national cultural fabric. Blood-drop kinship testing is not only a method of verifying kinship but also embodies the public’s understanding and emotional attachment to "legitimacy of bloodlines."

The interplay between blood-drop kinship testing and blood type identification reflects the trajectory of forensic knowledge transformation at the time. Pioneers like Lin Ji promoted not only the practice of a technology, but also a revolution in the cognitive system of forensic medicine. The reason this revolution was so difficult was that it needed to overcome not only technical barriers, but also traditional inertia deeply rooted in all levels of society.

4. Presentation of Impact: The Complex Landscape of Technological Transformation

4.1 Sociocultural Conflicts in Technological Transition

Technological transformation leads to the optimization of a series of work indicators such as efficiency and accuracy, inevitably causing changes in the forensic profession. In the theater of family reunion, the ancient blood-dripping method is gradually marginalized. With the introduction and repeated performances of what is considered "modern" Western science and technology, the protagonist of the ritual has shifted to modern technology. Like the audience, they are all shocked by the time-space dislocation of tradition and modernity, although as viewers they cannot perceive the different stakeholders behind the characters' involvement and struggle over technology.

In the early 20th century, forensic medicine in China still relied on coroners for autopsies. The coroner was a traditional forensic doctor established in ancient China, and their forensic system, as evidenced by ancient forensic books like *Collected Cases of Injustice Rectified*, was outdated and unscientific. Therefore, the introduction of blood typing technology facilitated the transformation of traditional coroners into modern forensic doctors. Through understanding society and recognizing the drawbacks of the old autopsy system, Lin Ji's determination to dedicate himself to forensic medicine was further strengthened. He believed that forensic medicine uses medical knowledge to identify and study legal issues. The essence of law is the conviction of punishment. Forensic medicine is one of the medical applications of the state. Legislation, the judiciary, and administration all require forensic doctors. This process of career transformation also encapsulated the insignificant life of a small figure.

Secondly, the failure of blood-drop kinship testing shocked the public's subconscious, refreshing their cultural and Western medical perspectives. Blood-drop kinship testing, as a traditional mythological narrative, encompassed both blood ties and indigenous technological identity. The late Qing Dynasty was an era of struggle and modernization for the Chinese nation. In terms of national salvation, the narrative of blood symbolized national cohesion and identity; indigenous technology was one source of national confidence. However, the myth of blood-drop kinship testing, carrying this dual meaning, was shattered and overturned by Western forensic technology. New scholars embraced and learned modern medical techniques, moving towards empirical scientists. Paradoxically, the connotation of blood in blood-drop kinship testing continued to be used.

In addition, trust is the foundation of a family. When the authenticity of the parent-child relationship is questioned, the crisis of trust between spouses and parents and children can have a devastating impact on the family. Whether in ancient times, the Republic of China era, or even in modern times, there are always families facing the ethical dilemma of paternity testing. The parties involved will inevitably fall into the tug-of-war and contradictions of family ties, and feelings of doubt and anxiety will arise.

4.2 The Myth of New DNA Technology and the Ethical Dilemma

In the latter half of the 20th century, DNA technology advanced rapidly, achieving a 99% or higher success rate in confirming parentage through DNA testing. Undoubtedly, this is a modern technological marvel. However, the very nature of paternity testing dictates that it will inevitably touch upon ethical and moral boundaries. Qian Guangrong pointed out new ethical issues arising from paternity testing :

First, it reinforces the significance of male parental rights while neglecting the significance of female parental rights, contradicting the civilized and progressive direction of modern society's "gender equality" in marriage and family ethics; second, it induces and fuels distrust between spouses, easily leading to a crisis of trust in marriage and family; third, it strengthens the physiological and bloodline ethical significance of sexual relationships while weakening their social ethical significance, which is inconsistent with the modern civilized trend of marriage; fourth, it deprives the embryo of its right to normal growth, infringes upon the child's legitimate developmental rights, and demonstrates a certain contempt for the right to life and development. From blood-drop paternity testing to DNA, the scope of discussion on ethical dilemmas will inevitably expand. (Qian, 2006) Family ethics, human rights, bloodline recognition, and national identity remain the underlying ideological themes behind technological development.

Ethical dilemmas arise, much like the crucifixion that binds paternity testing. However, the resurrection of Jesus undoubtedly symbolizes love and redemption, and paternity testing technology can also bring about reunions and the deep bond of blood ties. Therefore, it is necessary to view and apply it dialectically.

5. Conclusion

The century-long transformation of paternity testing technology from blood-drop kinship testing to DNA testing is essentially a historical process of interaction between technology and socio-cultural factors. Within the construction of mythology, blood-drop kinship testing not only symbolizes traditional blood ties but also serves as a connecting link in clan ethics. Its rituals reinforce the authority of the myth, thus creating a continuously reinforcing cycle. Even after Qing Dynasty intellectuals questioned its scientific validity, blood-drop kinship testing persisted into the Republic of China era due to political ritual needs and cultural inertia.

During the Republican era, the introduction of blood typing brought about a technological transformation, resulting in a complex localized landscape: a reinterpretation of the meaning of blood, occupational conflicts, and the reconstruction of ethical order. However, blood-drop kinship testing continued to be used, encompassing economic, cultural, and institutional factors, until the emergence of more scientific HLA and DNA technologies.

From blood-drop kinship testing to DNA testing, we can see it as the deconstruction of an old myth and the construction of a new one. Technological transformation is a reconstruction of myths. The rituals and operational logics of the two myths are quite different, but their underlying ethics are largely the same. The relationship between technology and society deserves further reflection, and a balance should be sought between technological rationality and humanistic concern. At the same time, it should be recognized that construction is an eternal process.

Acknowledgments

This paper was supported by Provincial Undergraduate Training Program on Innovation and Entrepreneurship (Number: S202510345143)

References

F.·Oppenheim, & Du, K. M. (1924). Views of Tongji Medical School Professors on Collected Cases of Injustice Rectified. *The Law Review*, *63*, 18-20.

Huang, L. H. (2018). *Complete Book of Blessings and Benefits*. Yangzhou: Guangling Press.

Huang, R. T. (1995). *Forensic Sage: The Life and Work of Lin Ji*. Beijing: World Publishing Corporation.

Hunan Provincial Education Inspectorate. (2012). Collected Essays on Hunan Studies, Changsha: Yuelu Press.

Ji, X. L. (1980). *Notes from the Thatched Abode of Close Observations*. Shanghai: Shanghai Ancient Books Publishing House.

Jia, J. T. (2000). *A History of Forensic Medicine and Forensic Science in the World*. Beijing: Science Press.

Li, H. Z. (2007). *Complete Works of Li Hongzhang*. Hefei: Anhui Education Press.

Liang, G. (1921). The United States Also Uses the Blood-Drop Method to Determine Authenticity. *The Chinese Illustrated New*s, *8*(7), 13.

Lin, J. (1934). Special Issue on Forensic Case Studies (Vol. 1, pp. 43-105). Forensic Monthly.

Lin, J. (1936). Provisional Measures for Forensic Identification and Inspection: With Classification Tables of Identifiable Cases and Fee Schedules. *New Medicine*, *4*(7), 213-217.

Qian, G. R. (2006). Paternity Testing: The Moral Paradox of Technology Safeguarding Family Ethics. *Studies in Ethics*, *4*(4), 101-102.

Shen, J. B. (1985). *A Study of Criminal Laws Through the Dynasties* (Vol. 4). Beijing: Zhonghua Book Company.

Song, C. (2023). *Collected Cases of Injustice Rectified*. Beijing: Zhonghua Book Company.

Tuo, T. (1985). *History of the Song Dynasty*. Beijing: Zhonghua Book Company.

Wei, S. (1974). *Book of Wei*. Beijing: Zhonghua Book Company.

Wiener, A. S. (1948). Chapter I: introduction. In *Blood groups and transfusion*. Springfield: Charles C. Thomas publisher.

Yao, S. L. (1973). *Book of Liang*. Beijing: Zhonghua Book Company.

Yi, M. (1913). On the Blood-Drop Controversy. *Shanghai Judicial Journal*, *11*, 27-29.