Scientific Research Publishing

Open Journal of Genetics, 2024, 14, 27-36
https://www.scirp.org/journal/ojgen
ISSN Online: 2162-4461
ISSN Print: 2162-4453

Morgan's Mistake Leads to a Revolution in Genetics

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How to cite this paper: Zhou, M.Y. (2024) Morgan's Mistake Leads to a Revolution in Genetics. *Open Journal of Genetics*, **14**, 27-36.
https://doi.org/10.4236/ojgen.2024.142003

Received: March 25, 2024
Accepted: June 4, 2024
Published: June 7, 2024

Abstract

This paper reviews the author's research since 2018 on Mendel's gene assumption. The main conclusion is that Morgan's misreading of Mendel's gene assumption would lead to the inevitable Copernican-like revolution (geocentrism replaced by heliocentrism) in genetics. The evidence for this judgment comes from written records in Morgan's *The Theory of the Gene*. The result of Mendel's experiment proposed the "second question of genetics" (template question), aim at which he assumed the gene was the element controlling individual specification. This led to dualistic genetics (two elements forming the germplasm). However, the gene located by Morgan was germplasm able to give rise to the individual—the answer to the "first question of genetics". It ushered in gene-monistic genetics. The confirmation of the gene as DNA has opened a new era of physical verification of gene intension. The inability of DNA to build 3',5'-phosphodiester bonds revealed that the gene has neither the ability to produce individuals nor is it self-replicating; consequently, the basis of gene monistic genetics completely collapsed. Instead, the universal fact that the egg's transcriptase initiates DNA (genome) transcription giving rise to the individual (unless accidents occur) confirms that Mendelian dualistic genetics is scientific genetics.

Keywords

Mendel, Morgan, Germplasm, Genes, Transcriptase

1. Introduction

The Copernicus Revolution arose from people's mistake in locating the Earth (as the center of the universe). The necessity for a new genetics revolution stems from the mistake in locating the gene (as germplasms). *The Theory of the Gene* is a classic work by Morgan who created Gene theory. In *The Theory of the*

Gene Morgan directly regarded Gene theory as "the modern theory of heredity" ([1], p. 1). "The characters of the individual are referable to paired elements (genes)" ([1], p. 25), "So long as a complete set of units (genome) is present, the power to produce a new whole is potentially given" ([1], p. 28) are the basic ideas of Gene theory. In short, the gene Morgan located is germplasm able to give rise to the individual (all characters included). [Note: The author chose the concept of germplasm here because Weisman's definition of germplasm has a definite and unique connotation, that is, germplasm can produce an individual. Genes, genetic material, or hereditary material do not have such connotations. Genome is equivalent to germplasm in Gene theory, but the author will prove that genome is actually not germplasm, Therefore, it cannot replace germplasm. Weismann did not find germplasm, but germplasm should be an objective concept. Eggs can produce chickens, which proves the existence of individual producers, *i.e.* the existence of germplasm, within the fertilized egg.] However, after the gene was confirmed to be DNA, the inability of DNA to build 3',5'-phosphodiester bonds exposed the truth regarding the gene as a template controlling the individual's specifications. The notion of templates being able to produce individuals is as absurd as blueprints being able to produce airplanes. If a template can create cells, then DNA, which does not consume energy or do work, is a perpetual motion machine. This contradicts the law of conservation of energy and is anti-scientific. In fact, logical reasoning is easy: because the genome is a template, the substances that follow its limitations to perform producing operations on the template should be another element that produces the individuals. The difficulty, however, is that the genetic community does not know what is wrong with Gene theory; similarly, the genetic community does not also know why it should reject the theory and introduce egg transcriptase as another element forming the germplasm. These are the exact topics that will be solved in this paper.

2. Mendel's Experiment and the Gene Discovered from It

"He crossed a tall variety of edible pea to a short variety. The offspring, or hybrids, F_1, were all tall. These were allowed to self-fertilize. Their offspring were tall and short in the ratio of three tall to one short. **If the tall variety contains in its germ-cells something that makes the plants tall, and if the short variety carries something in its germ-cells that makes the plants short**" ([1], p. 2) (Here the "something" is what was later called "the gene"). The first half of the above quote is about the experiment and its results, whereas the bold section that follows is the gene assumption. This is the only text in the entire book *The Theory of the Gene* that defines or locates the gene.

The question raised from such experiment' results is "Why are there always two types of offspring from a cross between tall and short varieties (pea): one being the tall type with the same specification as the tall variety, and the other being the short type with the same specification as the short variety? Even when

the F_1 were all tall, after F_1 self-fertilization, the short type appeared again in the offspring". This question does not ask "What produces the individual" at all, so it is not the "first question of genetics". And its answer should not be germplasm. We refer to it as the "second basic question of genetics". The "second question" usually appears in sexually reproducing species. Because there are two parents (dad and mom), for the producer (fertilized egg) a new question arises: which specification pattern does it follow from its parents (dad and mom) to produce offspring? The "second question" is a matter of pattern or a matter of template [2]. It induced Mendel realize whether the gametes of each variety have hereditary elements controlling the offspring to be own variety specification.

In response to the above question, Mendel proposed his gene assumption: "If the tall variety contains in its germ-cells the gene that makes the plants tall, and if the short variety carries the gene in its germ-cells that makes the plants short". The germ cells involved in the assumption are actually gamete cells, because only gametes participate in hybridization. So, in zygotic cells, *i.e.* fertilized eggs, there will be a set of genes from each hybrid parent. Mendel then assumed that the tall gene is dominant and the short gene is recessive, which successfully explained the phenomenon that F_1 all tall, and F_2 tall and short in the ratio of three tall to one short ([1], p. 3).

It was also on the basis of the gene assumption above that Morgan came to the understanding that "the characters of the individual are referable to genes" ([1], p. 25) and eventually located the genes as the producer of the individual (all characters included). Its error is clearly misreading the above assumption as "if the tall variety contains in its germ-cells something that makes the plants tall (height), and if the short variety carries something in its germ-cells that makes the plants short (height)". Thus, genes and characters (e.g. individual heights) are linked together.

Morgan apparently failed to consider that Mendel was doing a hybridization experiment between two varieties. It is necessary to clearly report to readers what variety hybrid offspring belong to. However, the above quotation did not point the varieties of offspring. Based on the connection between the above and the following text, it can be seen that this is due to the omission of repeated words. After restoring the omitted words, the logical original text of the above quotation should be: "He crossed a tall variety of edible pea to a short variety. The offspring, or hybrids, F_1, were all tall (variety). These were allowed to self-fertilize. Their offspring were tall (variety) and short (variety) in the ratio of three tall to one short. If the tall variety contains in its germ-cells something that makes the plants tall (variety), and if the short variety carries something in its germ-cells that makes the plants short (variety)" (variety in parentheses is the word Mendel thought could be omitted to avoid repetition). That is, in this quote, "tall" and "short" actually refer to "tall variety" and "short variety". Just to avoid unnecessary repetition. At the beginning, the terms "tall variety" and "short variety" were indicated, so the word "variety" was omitted when it was mentioned later, leaving only "tall" and "short".

From this we can deduce the overview of Mendel's hybridization experimental design. It turns out that the two parents he picks each time are very closely related varieties. In the cross between tall and short varieties, plant height is the identification mark of the two varieties, and it is also the only difference between the two varieties. In this way, the character of plant height became the only mark to identify the two varieties. It is also the best tool used by Mendel to count tall or short varieties. Can people imagine Mendel measuring the height of each individual to determine the number of individuals? That is a clumsy, tiring, and error prone method. As the identification mark of the two varieties, the plants' height is a certain specification. In other words, the height of the tall variety plants showed a statistically normal curve distribution. The height of the short variety plants also showed a normal curve distribution. The two curves should not intersect; otherwise, it would be difficult to distinguish the variety of the plants within the intersection. Therefore, as an identification mark, plants height character is only a tool to identify two varieties. Mendel did not have to measure each individual's height at all, he could tell at a glance to which variety any plant belonged.

We can now confirm that the "something" in Mendel's gene assumption refers to a haploid genome rather than gene(s) controlling one character. Because only the genome can control whole individual's specifications (variety). Of course, whether the gene is the pattern or the template controlling individual's specifications or the producer of the individual (all characters included) is ultimately determined by scientific facts, so the proof in this regard must continue in the following text.

So far, we have shown the gene assumed by Mendel is the facilitator making the individual to be parental (tall or short variety) specification rather than the producer of the individual (characters included).

3. The Significance of Mendel's Gene Assumption

3.1. Deriving Mendelian Dualistic Genetics Based on Mendel's Gene Assumption

Mendel did not provide further explanation for his gene assumption. For example, since the gene is the facilitator, then who is the receptor that accepts facilitation? And where is it? Mendel had not even said that the gene assumption implies that germplasm should be formed by two elements rather than only one. This actually created a serious obstacle for the world to recognize Mendel in a timely manner. Fortunately, the gene assumption can at least be easily deduced that the presence of the receptor who is facilitated by the gene. This logical reasoning is as follows: if the specification of a product needs an element to facilitate, then there is no doubt that this product's producer must be formed by the facilitator and the receptor that accepts facilitation; the product is made by the cooperation of these two elements. In short, the facilitator and its recipient are prerequisites for each other's existence. Only when there is a facilitator can there

be a recipient, and vice versa; without its recipient, there is no need for a facilitator. Furthermore, we can infer that since the gene is the element that controls the specifications of products (individuals), another element can only be the producing force element that follows the genome specifications to perform producing operations. Otherwise, without producing force, where would there be a product?

Next, we can infer that the producing force element exists within the fertilized egg. This is because it is a well-known fact that individuals are produced by fertilized eggs (zygotes), such as eggs can give birth to chickens. It can be seen that germplasm exists in fertilized eggs (single cells such as bacteria can also produce new individuals, and they also contain germplasm). So, the producing force elements as one element of germplasm should be within the fertilized egg.

Thus, the implicit logic of Mendel's gene assumption is that the hereditary material (germplasm) is composed of two elements: one is the gene (genome) controlling the individual specifications, and the other is the producing element that accepts the gene (genome) limits to perform the operations. The individual is produced by the producing element in the fertilized egg following the specifications limited by the gene (genome). So, Mendelian genetics is dualistic genetics [2] [3] [4] [5] [6].

3.2. Mendelian Dualistic Genetics Would Inevitably Lead to a Copernican-Like Revolution in Genetics

The difference between Mendel and Morgan in locating the gene is no less than the difference between locating the center of the solar system to the Sun or the Earth. But gene localization errors do not affect the specific research of the gene, just like geocentrism does not affect the specific research of the Earth. Morgan's great achievements in the field of gene research undoubtedly played a great role in promoting Gene theory-modern theory of heredity to be the authoritative genetics in the 20th century. However, the gene localization error has the same serious hindering effect on the establishment of scientific genetics as geocentrism had on establishment of scientific astronomy. If we persist with gene theory, then the near-term goal of artificial life, as well as re-creating dinosaurs, mammoths, and other prehistoric extinct creatures, cannot be achieved, and the further exploration of the origin of life and life materials will go astray.

The greatness of Mendelian dualistic genetics is not only the negation of gene-monistic genetics, but also the complete negation of all monistic genetics in history, such as Preformation, Pangenesis and Germ-plasm theory. Nevertheless, we still need to scientifically verify Mendelian dualistic genetics in the following parts of the paper.

4. Mendelian Dualistic Genetics Has Been Fully Confirmed by Objective Facts

In 1944, Avery *et al.* confirmed that genes comprised DNA, opening the door to physical verification of gene localization [7], and molecular biology was born af-

ter the confirmation of DNA molecular model in 1952 [8]. Today's university textbooks on molecular biology and cell biology, which contain the scientific achievements from dozens of Nobel laureates, have become the complete evidence banks for Mendelian dualistic genetics. A large amount of literature has existed for decades. Due to people's reverence for the authority of Gene theory-modern theory of heredity and not knowing where it goes wrong, these scientific achievements have not been effectively utilized and their value has been reduced.

4.1. Genes (Genome) Have Been Proven to Be a Hereditary Element Controlling Individual (Characters Included) Specifications

1) In 1944, Avery *et al.* confirmed that genes are made of DNA, and stated: "DNA is capable of stimulating unencapsulated R variants of *Pneumococcus* Type II to produce a capsular polysaccharide" [7]. This proved that "DNA can make *Pneumococcus* to be S-type (encapsulated) specification". Contrast this with "Genes can make the individual (plants) to be tall/short (specification)", The two sentences' pattern are the same, but the corresponding words are different: genes are replaced with DNA, plants are replaced by *Pneumococcus*, and tall/short specification is replaced by S-type (encapsulated) specification. Avery *et al.* have experimentally confirmed the correctness of our interpretation of Mendel's gene assumption. They made it clear that genes are not the producers of characters (such as capsule), and that the new S-type pneumococcus is produced by prior *pneumococcus* (in which an element to perform producing job should exist) accepting the stimulation (facilitation) of its DNA (which had added capsule-related genes to form the S-type bacterial genome).

2) Science has proven that DNA is the template for producing RNA, which is the maker of various proteins, that these proteins (including enzymes) are the makers of other organic substances (including carbohydrates and esters); Thus, the gene (genome) of each fertilized egg is the original template for the material composition of offspring individuals (including characters). Thus, it determines the specifications of individual's organic matter and the specifications of the individual (including characters).

4.2. Egg Transcriptase (System) Has Been Proven to Be Another Hereditary Element

Because the genome is a template, dualistic genetics must prove the existence of element that accept template's specifications limits performing producing operations. The fact is indeed so. All fertilized eggs (including unicellular organism）of cellular organisms have transcriptase (system) following genome (DNA) specifications limits to perform producing job, and it is unique, that is, no other substance consumes energy to build 3',5'-phosphodiester bonds on the DNA template to perform producing job during egg transcription initiation. Consequently, the egg transcriptase (system) is the second element forming Mendelian

dualistic genetics' germplasm, the producing force element.

4.3. The Germplasm Formed by Transc × DNA Finally Proof Mendelian Dualistic Genetics' Authenticity

After the discovery of DNA and egg transcriptase, the authenticity of the duality composition of germplasm becomes the final step in confirming that Mendelian dualistic genetics is scientific genetics. Germplasm is not something that can be declared or claimed by anyone, it has a specific connotation as the hereditary material able to give rise to individuals. Only substances that meet the two gold standards are truly germplasm. The first gold standard is that germplasm must be the producer of the individual, and the second is that germplasm can replicate itself. The verification process is as follows. When verifying, we express the only form of cooperation between the egg transcriptase (system) and the genome, which is egg transcription, using Transc × DNA.

4.3.1. Transc × DNA Can Produce the Individual

The life of a fertilized egg is initiated by Transc × DNA. The fact is that any individual, whether animal or plant, is the product of a natural, preprogrammed, causally continuous and autonomously producing process caused by Transc × DNA. Without Transc × DNA, no new individuals (new living things) could come into being. These are all undeniable objective facts. Not only the new individual results from egg transcription, but also an individual in any phase of life as well results from this producing process caused by Transc × DNA (the individual in A, B…Z phase is the result of this process progressing to the A, B…Z phase, respectively, such that the individual in the N phase is the result of this process progressing to the N phase). Every chicken is a product of its Transc × DNA, and every person is also a product of its Transc × DNA [3] [6].

4.3.2. Second Gold Standard: Transc × DNA Can Replicate Itself

Since Transc × DNA can produce the individual, it must be able to replicate itself. Because there is an inevitable connection between the two. We can prove it by using 1 cell → 2 cells (the "→" in the formula means "produced"). The cells here can be single celled organisms such as bacteria. Above formula can be written as 1 cell (Transc × DNA) → 2 cell (Transc × DNA) as Transc × DNA is present in every cell. As mentioned above, individuals are produced by Transc × DNA, while cells after the formula are produced by Transc × DNA before the formula. But the last two cells all contain Transc × DNA. In other words, a new Transc × DNA was produced by Transc × DNA, indicating that Transc × DNA can replicate itself [3] [6].

5. Conclusions

1) Gene-monistic genetics is the product of Morgan's misreading of Mendel's gene assumption.

2) The discovery of the gene was Mendel's greatest achievement, which led to

the birth of Mendelian dualistic genetics.

3) Scientific facts accumulated over the 60 years since the gene was confirmed as DNA prove that Mendelian dualistic genetics is scientific genetics.

6. Discussion

6.1. Why Mendel's Achievements Have Not Been Recognized by the World for a Long Time

Mendel's paper went through 35 years after publication, during which time it was also submitted to giants such as Nageli and Darwin for review, but it was not understood. This should not be an accident but has a certain degree of inevitability. Mendel was actually creating completely new dualistic genetics, but his paper said nothing about it, so the reader cannot get any revelation in this regard. He simply reported his experiments and their results, and then proposed his gene assumption. Moreover, carelessly omit repetitive words that would normally be omitted to avoid being verbose. A historically original paper like his should not easily omit certain words that can be omitted, but should, on the contrary, pay special attention to the keywords, and even take the trouble to ask the reader to pay attention to the importance of keywords. In short, it is important to instill one's own ideas and inspiration into readers. Because the author should consider that their inspiration may not be universally perceived by readers, and not repeatedly emphasize it may be difficult for people to understand and accept. But Mendel didn't spend any pen or ink on it. In this case, the specificity of his gene assumption is difficult for readers without a pattern or specification idea to feel. In the shadow of the first question of genetics, which is the most pervasive opinion, it is highly likely that people will not realize that the gene is a pattern or template. If Mendel had made it a very important job to try to make the reader understand himself, perhaps Nageli would have realized that Mendel's thought, and Mendel's experience of being buried for 35 years may not have happened. The rediscovery Mendel began in 1900 was not a rediscovery of the meaning of gene assumption, but a discovery of the laws of the gene's heredity. This makes genes traceable objects. Morgan thus found the gene (located on chromosomes) and greatly elevated Mendel's status. However, for the reasons mentioned above, the meaning of the gene assumption remains unknown. Not only did Morgan's mistake go unnoticed, but the public quickly accepted his idea. Of course, this is related to Mendel's failure to clearly state that the gene only is one of the hereditary elements, nor to describe how his assumed element creates the minimalist mechanism of an individual like Darwin or Weisman did.

6.2. An Objective Underlying Factor for the Dominance of Gene-Monistic Theory for 100 Years

Before knowing the existence of gravity, military experts told you that the range of artillery depended on the horizontal thrust of gunpowder, and no one would disagree. Why? Because the earth's gravity exists objectively, although the artil-

lery range is the effect of the cooperation of two forces, but since humans do not know the earth's gravity, then the artillery range is attributed to the horizontal thrust of gunpowder who will find it is wrong? Similarly, the producing element within the fertilized egg objectively exists, and all instances that have been used to prove that genes can produce characters and individuals are actually caused by Transc × DNA. However, since the role of egg transcriptase has not been known, who would object to the above instances being interpreted as the role of the genome? It can be seen that the objective existence of producing force element within the fertilized egg, which has not been known, is a potential objective factor for the long-term dominance of Gene-monistic theory.

6.3. Highlights of This Review

1) As shown in Section 2 of this article. The author noticed what variety the offspring belong to in Mendel's hybridization experiments is must report to readers. Thus, it was discovered by the author that somewhere in the experiment and its results until his gene assumption, Mendel had omitted the word "variety" to avoid repetition in the text. After adding "variety", the original meaning of gene assumption becomes precise and accurate: the gene is the facilitator making the individual parental (tall or short variety) specification rather than the producer of the individual (characters included). This finding provides the strongest backing for the author's five papers on Mendel's gene assumption in seven years [2] [3] [4] [5] [6].

2) The author successfully adopted the concept of "germplasm". This allows the communication of genetics ideas or viewpoints to be accurate, and avoids the possibility that the author and the reader may not refer to the same concept. It is very important that the gene is one of hereditary material rather than germplasm able to give rise to individuals. DNA identification can determine criminals, pathogens and even the species of remains, but the genome can never produce an individual. Without clarifying the difference between some hereditary material and germplasm, it is impossible to get rid of the shackles of monistic genetics and enter the kingdom of dualistic genetics.

6.4. Regarding References

This article is a textual critics' research paper, the main research object is Morgan's *The Theory of the Gene*, and the focus of the research is the accuracy of the text's meaning. So *The Theory of the Gene* repeatedly appears in the reference list, and each time it is marked with a specific page number. This makes it easier for the reader to quickly find the quotation and check it for accuracy. The quote comes from Avery *et al.* is consistent with Mendel's gene assumption, and the referenced quote appears on page 137. Because the paper is lengthy, providing the page number will allow readers to find the quote quickly. Because this is a review of the author's work over the past 7 years, the relevant papers by the author are also included in the reference list. The literature on molecular biology

that has become common knowledge has not been referenced. Having more references is not always better, as long as there are enough to support the argument. How many references are there in Watson-Crick's article on the molecular model of DNA, and how many references in Einstein's article on relativity? The more original the article, the fewer references it is likely to have.

Acknowledgements

I thank Lesley Benyon, PhD, from Liwen Bianji, Edanz Group China (https://www.liwenbianji.cn/), for editing the English text of a draft of this manuscript.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Morgan, T.H. (1928) The Theory of the Gene. Yale University Press, New Haven. https://doi.org/10.5962/bhl.title.5978

[2] Zhou, M.Y. (2018) Do You Realize Two Basic Questions in Genetics? *Open Access Library Journal*, **5**, e4396. https://doi.org/10.4236/oalib.1104396

[3] Zhou, M.Y. (2018) The Answer to the "First Question" in Genetics: The Hereditary Material. *Open Access Library Journal*, **5**, e4645. https://doi.org/10.4236/oalib.1104645

[4] Zhou, M.Y. (2018) Mendel Actually Wants to Say: Genes Are Only One Element of the Hereditary Material. *Open Access Library Journal*, **5**, e4941. https://doi.org/10.4236/oalib.1104941

[5] Zhou, M.Y. (2020) The True Idea of Mendel's Assumption regarding the Gene Is Rediscovered. *Open Journal of Genetics*, **10**, 1-7. https://doi.org/10.4236/ojgen.2019.101001

[6] Zhou, M.Y. (2022) Cross-Century Discovery: Mendelian Dualistic Genetics. *Global Journal of Science Frontier Research*, **22**, 113-117. https://doi.org/10.34257/GJSFRGVOL22IS2PG113

[7] Avery, O.T., MacLeod, C.M. and McCarty, M. (1944) Studies on the Chemical Nature of the Substance Inducing Transformation of Pneumococcal Types. *Journal Experiment Medicine*, **79**, 137-158. https://doi.org/10.1084/jem.79.2.137

[8] Watson, J.D. and Crick, F.H.C. (1953) Molecular Structure of Nucleic Acids. *Nature*, **171**, 737-738. https://doi.org/10.1038/171737a0