Three rediscoveries of Mendel's law?

Some background of a plagiarism case in 1900

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April 2023

Abstract

The modern research method that was successfully applied to the case of Charles Darwin plagiarising Patrick Matthew, should also be applied to the lingering case of prominent biologist Hugo de Vries plagiarising Gregor Mendel.

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Introduction

Like all branches of history, the history of science has its controversies. A major dispute in the last ten years has been the debate between Dr. Mike Sutton and his Darwinist opponents about the level of plagiarism in Darwin's work. With digital techniques Sutton found clues and facts that charge Darwin [1]. One effect of Sutton's work is that one looks afresh at similar cases. To be specific: lingering for more than a century now is the question whether famous biologist Hugo de Vries (1848 – 1935) in 1900 tried to plagiarize the work of Gregor Mendel. In peaceful consensus most historians of science deny it. But the issue has not been really scrutinized. It seems fruitful to approach it with the method that was applied to the Darwin case. Since Sutton is a retired scholar now, an option seems that one or two students take on the case. In the meantime, the useful thing to do here is to give a preliminary sketch that can serve as an introduction to the subject matter.

A first scenario

In 1866 Gregor Mendel publishes his paper *Versuche ueber Pflanzenhybriden* [2]. It is ahead of its time, it disappears into oblivion for 34 years. Then, in 1900, three biologists, independent from each other, 'rediscover' the law of heredity that Mendel had published in his paper. Hugo de Vries in The Netherlands, Carl Correns in Germany, Erich von Tschermak in Austria. By 'rediscover' they mean: 'I discovered it myself, without knowing of Mendel's paper'. A remarkable threefold coincidence.

Hugo de Vries – the most famous of the three – is the first to present his 'rediscovery'. In March 1900 he publishes it in the *Comptes Rendus des séances de l'Académie des Sciences*. There De Vries presents Mendel's law without mentioning Mendel's name, thereby suggesting that he found it himself. But in his article he uses the word-pair 'dominant' and 'recessive'. They are invented by Mendel and belong to the core of Mendel's theory. How did De Vries come about these specific Mendelian words? Nobody else used them. What is more, De Vries does not use the pair casually or in passing. His article is short, less than three pages, less than forty sentences. On the first page De Vries introduces the Mendel-pair, prominent and *in italics.* Here is the quote: "Dans l'hybride le caractère simple différenciel d'un des parents est donc visible ou *dominant,* tandis que le caractère antagoniste est à l'état latent ou *récessif*." A few sentences later the pair appears again: "Les individus D auront le caractère

dominant pur ... les individus R auront le caractère récessif pur". And again: "Ceux-ci porteront le caractère dominant apparent et le caractère récessif latent." [3]. The Mendel-pair is of vital importance to the article, the only thing missing is Mendel's name. A harmless omission by seasoned scientist De Vries?

Theo Stomps was a student of Hugo de Vries, from 1907 his assistant. Later he became a biology professor, for many years they were colleagues and friends. Stomps writes that he once asked De Vries when exactly he became acquainted with Mendel's work. De Vries countered: Why do you want to know that? Stomps: because future generations might be interested. De Vries then answers that he received a copy of Mendel's paper from his friend Beyerinck shortly after finishing his heredity experiments, just before he was going to publish his results.[4] That story makes it possible to draw up a scenario of what could have happened: De Vries experimented for years, then he receives Mendel's paper. That gives him a key to explaining his research results. He sends an article to a German scientific periodical, and the above mentioned version in French. That way he claims priority for introducing this fruitful way of thinking about heredity. The French version is published first, 26 March 1900.

Enter Carl Correns. He too knows of Mendel's forgotten paper. On 21 April 1900 he reads the French article of De Vries. Immediately the next day, 22 April, he sends an article to his publisher. In it Correns sarcastically points to the fact that Mendel's terms 'dominant' and 'recessive' appear somewhat surprisingly in De Vries' text. Here is the quote: "Man kann das eine das *dominirende*, das andere das *recessive* nennen, wie es seinerzeit Mendel that und durch einen merkwürdigen Zufall nun auch De Vries thut." [5]. This 'merkwürdigen Zufall' (strange coincidence) damages De Vries. Correns goes on to give extensive credit to Mendel, thereby further disqualifying the priority-pretensions of De Vries. After that, De Vries has to fend off the impression that he plagiarized. The German version of his article is about to appear, the editor has sent him the proof-sheets for correction. On these proof-sheets De Vries inserts a few times the name Mendel, thus having a narrow escape from plagiarism accusations.

Back to Correns. He too publishes Mendel's law of heredity as a discovery of his own. Here is his account of the events: for years he did his research, not exactly knowing how to interpret his results. Then, early one morning, October 1899, lying in bed, the law of heredity came to him in a flash. He has no hurry to publish it, but a few weeks later he happens to read Mendel's paper. That triggers him to prepare his article for publication. He mentions that Mendel was there first and that therefore the credit should go to Mendel [6]. This story of Correns is later disproved. After his death a handwritten summary of Mendel's theory is found

among his notes, with Mendel's name in it. Correns wrote this summary on 16 August 1896, three years before his fictional flash. And another damaging fact: Correns had been a student in Munich, where botany professor Carl Nägeli was his promotion-professor. They were close, he married Nägeli's niece. Nägeli had a copy of Mendel's paper, had corresponded with Mendel, and had mentioned Mendel in publications. Having been educated in that environment, it is unlikely that Correns found Mendel's law without knowing Mendel's work.

The third rediscoverer Tschermak tells the same story as De Vries and Correns: he independently rediscovered Mendel's law, then happened to read Mendel's paper, and then published his 'independent' results. Not particularly plausible, especially since he was the grandson of biology professor Eduard Fenzl who had played a remarkable role in Mendel's life. It is probable that this grandfather set him on the Mendel trail.

The above elementary account of the threefold rediscovery [7] leaves out the many versions and opinions that have been published about the matter, almost exclusively by biologists. An approach from the angle of modern professional plagiarism research would add value. For now, we only look at some peculiarities about Mendel, De Vries and Darwin, to clarify their mutual positions. Correns and Tschermak will not further be discussed here.

Genetics and natural selection

Evolution has two fundamental legs: genetics (the cause of variation) and natural selection (the disappearance of the less fit). The genetics leg is established by Gregor Mendel, with a plagiarism attempt by Hugo de Vries. The natural-selection leg is established by Patrick Matthew, with a plagiarism attempt by Charles Darwin. There are similarities between the two cases. Patrick Matthew and Gregor Mendel were normal and modest persons. Not from a wealthy background, not moving in high society. Their bright minds discovered important facts about nature, they published their findings but did not make much ado about it.

Darwin and De Vries belonged to a different class. Darwin was very well-to-do. And De Vries was from a distinguished Dutch family, his father being a cabinet minister, his mother the daughter of a prominent professor in Leiden. Darwin and De Vries seem to have felt that their superior class and dignity implied the privilege to take the brainwork of a lower class person, just like the gentry took for granted the physical work of their servants, tenants and workers.

Darwin took Matthew's insight and wording. When he was criticised for it, he admitted Matthew's priority, but insisted that he himself had discovered it too, without knowing of Matthew. De Vries did the same: he took Mendel's insight and wording. When criticised, he admitted Mendel's priority, but insisted that he discovered it on his own without knowing of Mendel.

Darwin and De Vries had the network and the money to generate publicity. What they needed was a brilliant idea to spin that publicity around. Darwin used Matthew's idea, De Vries used Mendel's idea. The publications of Matthew and Mendel (Matthew 1831, Mendel 1866) were forgotten for three decades, they had exhausted their own right to fame. Darwin downplayed Matthew, De Vries downplayed Mendel.

Downplaying Mendel

After Mendel's iconic publication (1866) the 34 years of oblivion can be ascribed mainly to ignorance. Mendel simply was ahead of his time. But starting in 1900, when Mendelian genetics explosively conquers the biological world, a group of scientists belittles Mendel's achievement. Hugo de Vries is one of them. In 1907 the Natural Science Society in Mendel's town Brno invites biologists worldwide to support the realizing of a Mendel statue. De Vries refuses to contribute. When the statue is unveiled, 2 October 1910, Tschermak is present, William Bateson is present, many are present, but De Vries is not. And in 1922, when prominent biologists, among them Correns and Tschermak, attend the celebration of Mendel's 100th birthday, De Vries is absent again. In a letter to his colleague F.A.F.C. Went, 14 September 1922, he explains why he declined the invitation: "…the Mendel adoration is a fashion thing … that fashion will pass by. … The celebration in Brünn [Brno] is national and anti-English, especially directed against Darwin and therefore unsympathetic to me" [8]. Here De Vries shows a remarkable bigotry and narrow-mindedness. The young state of Czechoslovakia, founded four years earlier (1918), was proud of Mendel's achievement and wanted to honour his 100th birthday. Nothing anti-Darwinian there, every country honours its great ancestors. England, for instance, worships Darwin with Darwin statues, Darwin Medals, Darwin Days, Darwin Years, Darwin streets, Darwin stamps, Darwin posters, Darwin mugs, and an elaborate Darwin Industry. The point is that De Vries wanted to be part of the Darwin clan, he thought that paying respect to Mendel would hamper that ambition.

Another protagonist in downplaying Mendel is R.A. Fisher, holder of the prestigious 'Galton Professorship of Eugenics' at University College London.

Copley Medal, Royal Medal, Darwin-Wallace Medal, FRS, and tagged by Richard Dawkins as “the greatest biologist since Darwin” [9]. It took the English scientific establishment until 2020 to condemn Fisher’s racist and eugenic views and to posthumously withdraw some of his honours [10]. In 1936 Fisher writes an article in which he describes Mendel's work as fraudulent. It must have been tampered with, he says, because Mendel's results are too good. Fisher understands that it is implausible to accuse the good monk of fraudulent intent, but he has a solution for that: an assistant of Mendel must have committed the fraud. An assistant who knew what results Mendel expected, and who adjusted the numbers accordingly: "... Mendel was deceived by some assistant who knew too well what was expected. This possibility is supported by independent evidence that the data of most, if not all, of the experiments have been falsified so as to agree closely with Mendel's expectations" [11]. But Fisher’s attempt to disqualify Mendel fails. Mendel’s work is correct, the Darwinists have to acknowledge that Mendelian genetics has the future. The peace treaty between Mendelism and Darwinism finally is Julian Huxley’s book *Evolution – the Modern Synthesis* (1942). The synthesis being the integration of Mendelian genetics with Darwinian natural selection. Huxley: “Darwin knew nothing of mendelising mutations, and … selection is by itself incapable of changing the constitution of a species or a line.” [12]. In other words: first there must be variation, which is the department of genetics. Only after that there can be a natural selection, eliminating the less adapted.

Fast-forward to Richard Dawkins. His bestseller *The Selfish Gene* (1976) presents the gene as the main protagonist of evolution. Therefore one would expect him to show some appreciation for Mendel who, after all, is the discoverer of the gene. But no, he mentions Mendel only once, and in a negative sense. In that one passage he calls Mendel’s work “a little too simple” and he states: “Mendel perhaps did not realize the significance of his findings, otherwise he might have written to Darwin” [13]. Fact is, Mendel did realize the significance of his findings, but he was the only one. Hurt by the minimal response, he once said: “My time will come”. It did, but after his death. Biologists did not realize the significance of Mendel’s work for 34 years, but Dawkins manages to turn that upside down, saying that Mendel himself did not realize the significance of his work. And it strikes as equally odd that Dawkins does not mention the three early giants of genetics: William Bateson, Wilhelm Johannsen and Thomas Hunt Morgan do not exist in his book that presents the gene as the central actor in evolution.

Fast-forward again, this time to Dutch biologist and biology-historian Bert Theunissen. In 1997 he publishes in Dutch his article: *Did Mendel discover Mendel’s laws?* His answer is no: “the discovery of the laws that bear his name

is ascribed to him by later researchers." And consistently Theunissen explains why Mendel's discovery was not acknowledged for three decades: "Mendel ... can hardly be not-acknowledged for a discovery he did not make" [14]. Whatever it was that Mendel found was a piece of "fool's luck" [15].

So far an anthology of downplaying Mendel. An interesting detail is that they contradict each other. Number one says Mendel did not understand his own discovery, number two says Mendel had no discovery, number three says Mendel defrauded a discovery. The common denominator of the Mendel-critics is that they are all Darwinists.

Gregor Mendel

Mendel's intellectual capacities were remarkable. He was a fully certificated theologian, a teacher of Greek and Latin, a teacher of biology, physics and mathematics. He was one of the first to use statistics in a biology research project, a pioneer in systematic meteorology and an authority in bee-keeping. Beside that he managed the monastery after being appointed abbot. A short comparison to his contemporary Darwin is revealing: young Charles was taken from school at age 16 because of low performance, a study of medicine failed in the first year, with tutoring he managed a Bachelor in theology, his science schooling was nil.

When doing his ten-year research project (1855-1865) Mendel was fully aware of the reality of evolution. In the German-speaking world educated persons had been familiar with the idea since the beginning of the 19th century. Between 1802 and 1822 biologist Treviranus published his influential six-volume book *Biologie.* In volume 3 (1805) he elaborates that evolution is a reality, and that it includes man [16]. One year later, 1806, Lorenz Oken publishes the same view [17]. Oken was professor in Jena, Munich and Zurich, prolific author of books and articles, editor of several periodicals. He was a famous man, an asteroid is named after him, a plant variety is named after him, a medal is named after him. The publications of Treviranus, Oken and Lamarck moulded a generation of German biology giants: Johannes Müller, Ernst von Baer, Carl Vogt, Matthias Schleiden, Franz Unger and others. Franz Unger is relevant here. He was professor in Vienna, Mendel was his student in 1851-'53. In this period (1852) Unger published his book *Versuch einer Geschichte der Pflanzenwelt* (simply meaning: Plant Evolution; the word evolution was not current yet). In the book Unger states: "eine Pflanzenart muss aus der andern hervorgehen" (a plant

species must emerge from another plant species) [18]. Revolutionary stuff. Mendel's receptive mind absorbs it all.

Mendel is part of this awareness of evolution, but he has a problem. He is a monk, and in Austria the Catholic authorities are strict and conservative. The revolutionary year 1848 creates some intellectual freedom (in that window of time Unger's book appears), but soon the authorities tighten the reins. In 1854 the bishop visits the Brünn monastery for an audit. His conclusion: it devotes too much time to science and teaching. Not science but prayer is the task of a monk. He demands a shift towards the medieval monastic rule. In his report he even advises the archbishop to close the Brünn monastery altogether. But the abbot in Brünn, abbot Napp, sees the danger, he takes on the defence. He points at existing privileges of the Brünn monastery, he works his influential network, and he manages to fend off the threats. Mendel's experiment can start. But it is clear to abbot Napp and to Mendel that scientific publications must be formulated with the utmost care, to not provoke a ban from the authorities. Mendel has to square the circle: on the one hand he must avoid the suggestion that he doubts the Catholic doctrine of Creation, on the other hand he wants to share his scientific results. He succeeds. His article is published, the Church sees no danger in it, he is even appointed abbot.

Heredity, hybridism, development

In 2022 Bristol University hosts a conference on the occasion of Mendel's 200th birthday [19]. One of the speakers is Dr. Yafang Shan [20]. Shan says Mendel's paper is not about heredity: "Mendel did have some laws but they are not the laws of inheritance". Instead, Mendel's paper is about hybridism and development, Shan shows a slide with two bullet points:

- "Mendel's work was NOT about heredity."
- "Rather Mendel's work was about hybrid development in their progeny!"

Shan supports his first bullet point by saying that the German heredity-words (erben, Vererbung, Erblichkeit) are not in Mendel's paper. To be precise, Mendel uses 'vererbt' once, but apart from that isolated instance he indeed did not use the erb-word. Does this absence allow the assertion "Mendel's work is not about heredity"? A simple comparison suggests otherwise: Mendel's paper is also very much about genes, but the word gene is not in it. And another comparison: Darwin's *Origin*-book is about evolution but the word evolution is not in it. Apparently the absence of a word is not a convincing argument.

Shan's second bullet point contains the words 'hybrid' and 'development'. He says Mendel's paper has 110 times the word hybrid. In fact it is 177 times, but his point is clear: many hybrid-words against only one heredity-word, so Mendel's paper is about hybridism, not about heredity. This stand of Shan requires a closer look. When scientists want to collect information about a phenomenon, it is good practice to cross its borders, to stretch its limits, and then look how it behaves in those extreme circumstances. In the study of heredity the crossing of borders is called hybridism. Normal, standard and somewhat dull heredity is a male and a female of the same species producing offspring. Far more spectacular and instructive is crossing a male of one species with a female of another species. A horse with a donkey. That is hybridism, crossing the borders of species and varieties. Hybridism experiments yield information about heredity. When a scientist in mid-19th century wants to study heredity, the best he can do is experiment with hybridism. That is what Mendel did. By hybridising pea varieties he found the law of heredity.

Shan's second bullet point also mentions the word 'development'. What about it? In 20th and 21st century biology the word development has only one meaning: developmental biology is the study of an individual developing from embryo to maturity. But in the first seven decades of the 19th century, its German equivalent 'Entwicklung' had a second meaning beside that. Educated circles in Germany had a vivid awareness about evolution. The word evolution not yet being fashionable, they used other names for it. For instance Transformation and Transformismus and Transmutation and Naturgeschichte (= natural history). And Entwicklung (sometimes written as Entwickelung) and Geschichte and Entwick(e)lungsgeschichte. All these words had (beside other meanings) the meaning that later was to be covered by the word evolution. In short, the word Entwicklung had one meaning on a micro-level (development), one meaning on a macro-level (evolution), and one meaning in-between: the early 19th century had a conception that development and evolution were connected. Mendel's paper contains 62 Entwick...-words. Some of them mean development, some mean evolution, and some mean both at the same time.

The word 'Entwicklungsgeschichte' is important in 19th century German biology (which was leading in the world). It has an evolution-connotation [21]. Mendel uses the word twice: in his *Introduction* and toward the end of his paper. In the *Introduction* Mendel explains why his time-consuming research had been worthwhile: it helps to clarify "die Entwicklungsgeschichte der organischen Formen": the evolution of organic forms. And the second time, toward the end of his paper: "Für die Entwicklungsgeschichte der Pflanzen ist dieser Umstand von besonderer Wichtigkeit, weil constante Hybriden die Bedeutung *neuer*

Arten erlangen." (*italics* by Mendel). Translation: "this is very important for plant evolution, because constant hybrids get the significance of *new species."* Well, well, Mendel talks about evolution, he talks about new species, and in italics.

In italics? The Mendel Web does not write the words "neuer Arten" in italics. Why not? Modern printing uses *italics* to stress a word. 19th century German texts did it differently: to stress a word they printed it wide: w i d e . The German name for this is 'sperren'. Mendel's original text has some fifty words 'gesperrt'. The Mendel website, changing the text into a digital format, with modern fonts and make-up, set the 'gesperrte' words in italics. A correct decision. But they forgot a few. This is one of them. Mendel's text in 1866 has: n e u e r A r t e n . So the Mendel Web should have italics: *neuer Arten*. But it has plain: neuer Arten. Not correct [22].

Mendel is the person who introduces to mankind the concept of the gene. An impressive contribution. He does not call them genes yet, he calls them 'elements', the word element is in his paper ten times. Genes are the vehicles of heredity, without genes no heredity, they are inseparable. How then is it possible that Dr. Yafeng Shan appears on a Mendel memorial and teaches the conference that "Mendel's work is NOT about heredity"? And that it is about hybridism instead, as if these were separate areas. And that Entwicklung only means development. Who is Dr. Yafeng Shan? He works at the University of Kent, his page on that website is remarkable: he is a philosopher, his current project is "The metaphysical foundation of evidential pluralism". Beside that he works on "the epistemology of causation". He published about "New Directions in Metaphilosophy", about "Contrastivism and Non-Comtrastivism" (typo included) etcetera [23]. With that field of expertise, with all due respect, Dr. Shan does not seem to be naturally qualified to speak at a Mendel memorial.

Translation

Three obstacles impede modern scientists to read Mendel's paper. Firstly the 160 year time gap. Secondly the difference between modern English science language and 19th century German science language. And thirdly the fact that Mendel adapted his text to the limits that were posed by the Catholic authorities. To analyse all this is a specialist field of expertise. In this preliminary sketch only a few remarks can be made.

It would be revealing to ask modern students of genetics to re-write Mendel's article, keeping the content the same, but using modern science language. For

instance ‘hybrid’ was a fashionable word in the 19th century, but today it sounds somewhat old-fashioned, modern science has other words, like ‘transgene’. Something similar applies to ‘heredity’. In early 19th century, heredity mainly had a legal meaning: the inheriting of money, real-estate, a lordship, etc. Around the 18-sixties it gets its biological meaning: physical characteristics of a person inherited by offspring. Especially Francis Galton introduces this, although as a rather vague concept. In Germany and Austria the situation is more or less the same: the Erb-word (erben, Vererbung, Erblichkeit) first has the legal meaning, which in the course of the 19th century is joined by the biological meaning. For instance, in 1834 professor J.K. Nestler in Moravia publishes his articles “Ueber Vererbung in der Schafzucht” (Heredity in sheep breeding). This biological meaning was still somewhat new and unfamiliar when Mendel wrote. Later generations of geneticists use heredity-words naturally and without thinking, it is their familiar vehicle to express thoughts. One cannot expect Mendel to use ‘heredity’ the same way as a 21st century scientist does.

Back to the re-writing of Mendel’s paper. The translation should meet some requirements. Mendel’s 177 hybrid-words should be brought back to a maximum of 40. And his one heredity-word should be raised to a minimum of 40. Another requirement is that the ten times Mendel writes ‘element’, it should be replaced by ‘gene’. And the word Entwicklung should, each time it does not mean development but evolution, be replaced by ‘evolution’. Mendel has 62 times Entwick … Several of them will therefore change to ‘evolution’. The re-writing operation will demand precision and creativity, but the result will be interesting. Over time, Mendel’s paper has become less and less understandable. It did not have the words evolution, gene and heredity, whereas these three words today are the core of the genetic vocabulary.

Mendel’s language may be old, his content is modern, as can be illustrated by comparing him to his contemporary Darwin. In Darwin’s *Origin*-book God plays an important role, as the “Creator” who breathes life into matter. It does not matter whether Darwin writes this because he believes it, or as a lip service to Anglican orthodoxy (his autobiographical remarks are not trustworthy). Compare that to Mendel: he is a cleric, but his paper is purely scientific. Words like God or Creator are not in it, not the slightest reference to religion. It is a model paper that still would inspire biology students today, if they were able to actually read it.

A speculation about heredity

Darwin's *Origin*-book is a plea for evolution, but he derives his arguments and examples strictly from plants and animals, not from humans. Darwin refuses to speak out about human origin in that book, he writes only one sentence about it: "In the distant future … Light will be thrown on the origin of man and his history". With this sentence Darwin shoves the conundrum of human origin away to the 'distant future'. Why? Because the Church is strict: God created man in His own Image. God did not do that to the frog, so about animals and plants Darwin can safely write in evolutionary terms. But he does not dare to say the same about man. Only much later, after many authors did declare that man is part of evolution, Darwin follows them in his book *The Descent of Man* (1871).

Darwin is careful, his *Origin*-book does not speak about human origin. Mendel, being a cleric, must be double careful. Like John Cleese, in the classic BBC comedy series *Fawlty Towers,* instructs his hotel staff "Don't mention the war!", these biologists say 'don't mention humans'. Stay away from human origin, it upsets the authorities. Against this backdrop the word heredity is dangerous. In its predominantly legal meaning, heredity is always a human person inheriting something to another human person. Never a plant inheriting a lordship to another plant. In short, heredity is something between humans. Because Mendel's pea-research allowed speculations about the changeability of species, using the word heredity would imply the changeability of man. And that would be tinkering with God's Creation. Mendel does not use the word heredity, he uses two other words: 'hybrid' and 'development'. Hybrid is a safe word: hybridization experiments are always done with plants or animals, never with humans. The word hybrid is familiar to the breeders and agricultural scientists in Moravia who cooperate to find better breeds of farm animals and plants. To get more wool, better yields, more income. Therefore, the word hybrid has two advantages for Mendel: it is familiar, and it is restricted to plants and animals. Whereas heredity is an unfamiliar new word (in biology) and it refers to humans.

In the *Introduction* of his paper Mendel stated the goal of his research: he did experiments "deren Aufgabe es war, die Entwicklung der hybriden in ihren Nachkommen zu verfolgen." Translation: "Experiments, the purpose of which was to pursue the evolution of the hybrids in their progeny". Mendel follows them four, five, six generations. And to be certain that his readers understand it, Mendel repeats his aim at the beginning of his third section. There he states, clearly and distinctly: "… Merkmale zu beobachten und das Gesetz zu ermitteln, nach welchem dieselben in den aufeinander folgenden Generationen eintreten,

war die Aufgabe des Versuches." Meaning: "The purpose of my research was to watch […] characteristics and find out the law according to which they occur in the consecutive generations." It shows undeniably that Mendel's paper is about heredity, he wanted to find the law of heredity. He managed to say that using the word 'law', but without having to use the word heredity.

In the last sentences of his paper Mendel rejects the opinion that a species is stuck within strict borders beyond which it cannot change. There we recognize Mendel, the student of Franz Unger, who had taught him in 1852 that one species must emerge from another species. Mendel's paper is about genes, about heredity, about the law of heredity, about new species, about changeability of species, about evolution. He avoids conclusions that overstep the limits of ecclesiastical tolerance, especially about human origin. But with some close reading one sees not only what he has written down, but also what he eloquently did not write down.

Hugo de Vries

In 1870 Hugo de Vries finishes his study in The Netherlands and goes to Germany, the leading country in science. His most important teacher there is Julius Sachs, the international authority on plant physiology. He works in Sachs' laboratory on plant growth. His contacts in Germany are somewhat cool, he does not take root, in 1876 he is back in Amsterdam and develops a disciple-like worship for Darwin. His position has some resemblance to the position of Ernst Haeckel. Haeckel felt his German peers did not appreciate him enough, he turned to Darwin as a new leadsman to worship. Something similar is the case with Hugo de Vries [24]. In Amsterdam he is appointed extraordinarius in 1878 and ordinarius in 1881. By that time he is a leading expert in plant physiology. Darwin dabbles in that field too, the two correspond about plant growth. De Vries prefers Darwin's work to the work of his former German colleagues. The German scientists have doubts about Darwin's style of work. In Germany research is done by highly trained scientists in professional university laboratories that have decades of experience in their field of research. Whereas Darwin is an amateur biologist without experience on the subject, doing simple experiments at his house, 'country house experiments' [25]. Not surprisingly, Darwin's book *The Power of Movement in Plants* (1880) is fatally criticized by German scientists, especially by the Vienna professor in plant physiology Julius Wiesner, the successor of Franz Unger. Darwin writes to his son Francis: "He vivisects me in the most gracious terms, but most effectively. I wish that the confounded book had never been published." [26]. To Hooker he writes "no man was ever vivisected in so sweet a

manner". [27]. And to Hugo de Vries he writes: "I fear that I have fallen into many mistakes in my work on the Power of movement in Plants" [28]. But to his critic Wiesner he writes: "I adopted De Vries' views as seeming to me the most probable, but of late I have felt more doubt on this head." [29]

That causes a little shift in the Darwin-worship of De Vries. His admiration for Darwin's plant physiology cools a little, he now mainly worships him for his thoughts on evolution. De Vries realizes that evolution happens in two steps. First there must be variation, after that there can be Natural Selection. He agrees with Darwin about Natural Selection, but he thinks that Darwin's ideas about variation and heredity are rudimentary and not operable yet. There he sees a niche for himself, he wants to elaborate on Darwin's half-grown heredity thoughts. However, Darwin's thoughts on heredity are not half grown, they are wrong. First there is Darwin's blending theory, then his gemmula theory, then the 'Law of Ancestral Heredity' of his cousin Francis Galton, and at last the variations on that theory by Galton's protégé Karl Pearson. All wrong, as is well known today. But De Vries wants to stay in the vein of Darwin's thoughts. The effect is that De Vries isolates himself. The Darwin clan in England slowly realizes in the 19-twenties and thirties that their thoughts on heredity are wrong, and that Mendelian genetics is the correct approach to heredity. Slowly the Darwin clan gives up its chauvinism and adopts Mendelian genetics as the counterpart of Darwin's Natural Selection. That compromise between Mendelism and Darwinism is *The Modern Synthesis,* Julian Huxley's book title in 1942. The odd one out is De Vries, still trying to construct a law of heredity on the basis of Darwin's wrong heredity-views. Consequently De Vries's reputation dwindles from the thirties onward. There are three Dutch biographies of De Vries, the most ambitious being Zevenhuizen's 672-page work. Its title *"Vast in het spoor van Darwin"* has a double meaning, Zevenhuizen explains. The first meaning is 'Firmly in Darwin's footsteps'. The second meaning of the word 'vast' is stuck, like a cart stuck in the mud. Darwin's speculations about heredity are a dead end street in which De Vries has maneuvered himself.

The expression 'the Modern Synthesis' is interesting. Huxley's book *The Modern Synthesis* was published in 1942, deep in the Second World War, the English could scarcely withstand Germany's military power. In that situation Huxley proposed this synthesis of an English with an Austrian piece of science. In 1945 the cards lay differently, England had won the war. In that situation a synthesis between something English and something German was undesirable, it had to be an expression with the name Darwin more prominent in it. There was the old expression 'neo-Darwinism', used around 1895 in another meaning, but somewhat out of use and now available. So after 1945 the term 'Modern

Synthesis' is replaced by the term 'neo-Darwinism'. That new term expresses proudly that it is primarily Darwinism, with genetics as a subordinate addition crammed into the prefix neo-. With that, chauvinism starts again, the Darwin Industry starts. Richard Dawkins writes his book about genes, in which gene-discoverer Mendel is mentioned in a derogatory way, and the real geneticists Bateson, Johannsen and Morgan are not mentioned at all.

Despite three nominations, Hugo de Vries did not receive a Nobel Prize, although in that period (1901-1929) eight other Dutchmen did receive it. Apparently Stockholm judged his work to be not satisfactory. The Darwin clan, on the other hand, gave him positive feedback as long as he seemed to develop Darwin's ideas about heredity into a full-fledged Darwinian theory of heredity. His short meeting with Darwin (1878), the short letters from Darwin, the receiving of the Darwin Medal (1906), the visit to Darwin's grave (1909), the large portrait photo of Darwin in his study [30], these things made him happy. And he liked sinister members of the Darwin clan: the pioneers of eugenics Francis Galton and Charles Davenport. A word about these two.

De Vries and Francis Galton

Francis Galton admires his cousin Darwin, but he sees a flaw in his Natural Selection theory. That theory only works in wild nature: in the jungle the weak and injured are eliminated. In civilized society, however, the weak get financial aid and the injured get medical aid, they stay alive and get children. That procreation of the weak degrades the overall quality of the population, Galton thinks. Therefore the government must take over the selection task. Boys and girls must be tested, only the ones who get a permit are allowed to marry and reproduce. Every year the state will select the ten best boys and girls. In a public ceremony they get a certificate of quality. And when they, in the interest of the state, agree to marry another certificate-holder, their reward will be a wedding ceremony at the prestigious location Westminster Abbey, in the presence of the queen, and the state will pay for the education of their children. Furthermore, Galton addresses the problem of leadership: prehistoric society had been elementary, being a leader was simple. But modern society is complex, leaders sigh "under an intellectual load too heavy for their powers". Galton's solution: "breeding for the highest order of intellect" will solve the shortage of "master minds". With one-twentieth of the budget for breeding horses or dogs, it is possible to breed a race of geniuses [31]. On that level Galton goes on, publication after publication: 1865, 1869, 1872, 1873, etc. In 1883 he coins the term 'eugenics' for these phantasies about breeding programs for the English people.

What he needs is data about the physical and mental qualities of the population, to be able to select the best breeding specimens. To get these data he sees an opportunity at the 1884 'International Health Exhibition' in Kensington. There he opens, at his own cost, his 'Anthropometric Laboratory' where he measures visitors. After the exhibition he continues the laboratory five more years, and he designs a questionnaire, asking people to fill it in and send it to him. The collected data he stores at the 'Eugenics Records Office', a database which he starts in 1904 at University College London.

Darwin is pleased with Galton's addition to his theory. When in 1869 Galton's book *Hereditary Genius* is published, Darwin writes him a letter: "I do not think I ever in all my life read anything more interesting and original. And how well and clearly you put every point. … You have made a convert. … I congratulate you on producing what I am convinced will prove a memorable work." And in his own next book *(The Descent of Man,* 1871) he refers to Galton's book as "his great work". Hugo de Vries is equally enthusiastic about it, he was "deeply impressed", so De Vries-biographer Zevenhuizen [32].

In 1969 Ruth Schwartz Cowan finishes her dissertation, an intellectual biography of Francis Galton. Due to the outstanding quality of this study, in 1985 it is selected for a scientific series in which 32 classic books about heredity get a new edition. Schwartz Cowan's book is devastating for Galton. She sees that by 1969 English and American biologists still are in awe for him, although his ideas on heredity "…were naïve and were subsequently proven false". She notices that prominent biologists usually mention Galton in their publications, although "…it is … difficult to determine precisely what Galton did to warrant his inclusion in any of those texts". Schwartz Cowan is surprised by the contrast between the poor quality of Galton's work and his status as a genius: "In more ways than one his ideas about heredity were incredibly naïve, yet many of his contemporaries … regarded him as a profound and influential thinker". Galton's first publication about heredity is his article *Hereditary Talent and Character* (1865), the basis for his later work. Looking back to it forty years later, in his memoirs, he is still pleased with it, he quotes extensively from it, and he points at its "…justness and comprehensiveness" [33]. But Schwartz Cowan has another opinion about the article: "…by even the kindest estimation it is a scientific farce". She finds it so bad that "…one hardly knows where to begin criticising it". The atmosphere of shallow pretension around Galton has hindered Schwartz Cowan: "Fighting down the 'Darwin's-cousin-who-was-a-genius' image has been one of the most difficult aspects of this thesis." [34]

However, while tinkering with his grandiose eugenics idea, Galton produced two spin-offs that proved useful to science: the statistical tools 'regression' and 'correlation'. Hugo de Vries was impressed by Galton's statistical tools [35], he applied them in his own botanical work. But Galton was not a statistician, he was a eugenicist, his statistical tools were only tools, serving his eugenics. De Vries delightfully digested Galton's books without noticing anything strange in them, and without distancing himself from their eugenic scope.

Karl Pearson

Early 20th century Karl Pearson is the most orthodox ideological heir of Darwin and Galton. In 1901 he starts the periodical *Biometrika.* The authoritative Thomas Hunt Morgan in 1916 describes the group around Pearson as "…the English school – the biometricians – who amongst the post-Darwinian school are assumed to be the lineal descendants of Darwin" [36]. Pearson agrees with that: "I belong to a school which still believes that Darwin taught us the truth" [37]. After carefully studying the writings of his heroes Darwin and Galton, Pearson in 1900 presents his views in a public lecture. In 1901 it is published as a booklet, with a reprint in 1905: *National Life from the Standpoint of Science.* It gives a Darwinian-Galtonian recipe for Home Affairs as well as for Foreign Affairs. Interior policy should focus on breeding 'prize-cattle'. His words 'cattle' and 'herd' do not refer to cows or other animals, but to humans, the British are a breeding stock. And as far as foreign policy is concerned, Pearson warns against peaceful coexistence. Peace is stagnation, leading to degeneration. Foreign policy should happen "…chiefly by way of war with inferior races" and subsequently "…completely drive out the inferior race". That is "…the great lesson we must learn from natural selection". And he concludes: "I think it may be called the scientific view of a nation" [38].

The Darwin clan, pleased with Pearson, rewards him lavishly. In 1901 Galton supports Pearson's *Biometrika*-initiative. In 1907 he appoints Pearson as director of the Eugenics Records Office (from then on it is called the 'Galton Laboratory for National Eugenics'). And in his last will Galton assigns his legacy to the foundation of a 'Galton Professorship of Eugenics' at University College London, on the condition that Karl Pearson will be the first to hold this Galton Chair. Galton dies in 1911, Pearson holds the Galton Chair from 1912 to 1933, his successor is the above mentioned R.A. Fisher. In 1934 Pearson praises Hitler's eugenic practice as the culmination of Galton's theory [39].

There is a difference between Darwinism before the Second World War and Darwinism after the Second World War. Pre-war Darwinism had a rough and coarse character: life is a permanent ”war-of-nature”, a “battle-of-life”, two key soundbites of Darwin. This war-element in Darwinian thinking partly inspired Nazi-ideology [40]. To distance itself from that compromising heritage, post-war Darwinism tailored a more velvet version of Darwinism that presents evolution as “…usually a peaceful process in which the concept of struggle is really irrelevant” [41]. It downplayed the Darwinian war-language as harmless “metaphors” [42] and styled Darwin as a noble Santa Claus. Karl Pearson, who died in 1936, had the more authentic and belligerent pre-war Darwinism: the winner lives, the loser perishes, evolution is a chain of winners. And because Pearson sees Darwin as the top of the evolution, Darwin must be the product of a formidable chain of winners. That brings Pearson to the following statement about Darwin’s family background:

> "He is descended in four different lines from Irish kinglets; he is descended in as many lines from Scottish and Pictish kings. He has Manx blood. He claims descent in at least three lines from Alfred the Great, and so links up with Anglo-Saxon blood, but he links up also in several lines with Charlemagne and the Carlovingians. He sprang also from the Saxon Emperors of Germany, as well as from Barbarossa and the Hohenstaufens. He had Norwegian blood and much Norman blood. He had descent from the Duke of Bavaria, of Saxony, of Flanders, the Princes of Savoy, and the Kings of Italy. He had the blood in his veins of Franks, Alamans, Merovingians, Burgundians, and Longobards. He sprang in direct descent from the Hun rulers of Hungary and the Greek Emperors of Constantinople. If I recollect rightly, Ivan the Terrible provides a Russian link." [43]

Pearson’s work is a rich source of quotes from the Darwinian-Galtonian universe. He was deemed a pillar of English science. Professor at University College London for half a century (1884-1934), editor of the ‘scientific’ periodical *Biometrika,* honorary doctorates, Darwin Medal, FRS, etcetera. As late as 2007 the English academic establishment honoured his 150th birthday with a memorial conference. However, it is difficult to talk about Pearson in other than psychiatric terms.

De Vries and Charles Davenport

Right from the start in 1901, Pearson's periodical *Biometrika* reinforces its editorial board with the like-minded American Charles Davenport. In the first decade of the 20th century *Biometrika* is seen as the vehicle of orthodox Darwinian thought. Hugo de Vries, eager to be on the Darwinian bandwagon, befriends Davenport. In 1904 Davenport starts a 'Station for Experimental Evolution' in Cold Spring Harbor. Who does the opening speech? Hugo de Vries. In 1910 Davenport opens a second institute, the Eugenics Record Office (ERO, like Galton's ERO in London), of which he makes his friend Harry Laughlin director. In 1917 the two institutes merge (name: ERO), with Davenport as director. This pseudo-scientific institute is one of the driving forces behind the racism and eugenics that reign exceptionally rude in America in the first three decades of the 20th century. Race segregation, white schools, white buses, forbidden marriage between black and white, compulsory sterilization. When Hugo de Vries visits Davenport again in September 1912, he simply writes in his notebook "In US marriages between whites and coloured people are forbidden" [44]. It does not cross his mind that it is an undesirable situation and that Davenport's eugenics plays a central role in it. In 2003 Edwin Black publishes his impressive 600-page book *War against the weak – Eugenics and America's Campaign to Create a Master Race.* It documents extensively Davenport's central role in it.

In memory of Galton, who died in 1911, the Eugenics Education Society in 1912 organizes a grand eugenics conference in London. President of the conference is Darwin's son Leonard Darwin, vice-presidents are the American eugenicist Davenport and the German eugenicist Alfred Ploetz, patriarch of the Nazi Rassenhygiene, who in 1936 is appointed professor by Hitler. At that London conference, 1912, the 'Permanent International Eugenics Committee' is founded, with Leonard Darwin as its president. In 1925 the name of the organization is changed to 'International Federation of Eugenics Organizations', IFEO, and Leonard Darwin is succeeded by Davenport as President. In 1932 Davenport hands over the presidency to his successor Ernst Rüdin, the German Nazi-criminal. Davenport and his American colleagues inspire the Nazi eugenicists. In return the German eugenicists invite their American colleagues for honorary doctorates and prestigious congresses about race purity. An example: in 1922 Davenport's co-worker Harry Laughlin writes the "Model Eugenical Sterilization Law", to be used by American states to legalize compulsory sterilization. It is adopted by thirty American states. At 14 July 1933 Nazi-Germany passes its law on compulsory sterilization. It is modelled after

Laughlin's law, in 1936 Laughlin receives a honorary doctorate from the Nazified university of Heidelberg [45]. Germany does more sterilizations than the US, which brings an American eugenicist to the comment: "The Germans are beating us at our own game". [46]. In 1934 Leon Whitney, executive secretary of the American Eugenics Society, publishes a book *The case for Sterilization.* An assistant of Adolf Hitler writes him a letter asking for a copy (1934). He sends it, and receives a personal thank-letter from Hitler [47].

All in all eugenics exists some sixty years: 1885-1945. The first twenty years are predominantly English (Galton, Pearson, et al.), the second twenty years predominantly American (Davenport, Madison Grant, Paul Popenoe, et al.), the third twenty years predominantly Nazi-German (Alfred Ploetz, Eugen Fischer, Otmar von Verschuer, et al.).

When in 1927 the 'Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre und Eugenik' opens in Berlin, the guest of honour is Davenport. Director of the Institut is Eugen Fischer who later becomes the top-eugenicist of the Nazi regime. On his way from Berlin back to Cold Spring Harbor, Davenport visits his friend Hugo de Vries for the second time (De Vries visited him in the US three times) [48]. De Vries sees no harm in Davenport's views. In his ambition to become Darwin's counterpart and a member of the Darwin clan, De Vries apparently is not hindered by something like a political radar or moral compass.

From ca. 1850 onward there seem to be two distinct strings of biologists. On the one hand the high quality string: Franz Unger, Gregor Mendel, Rudolf Virchow, Thomas Huxley, William Bateson, Wilhelm Johannsen, Thomas Hunt Morgan, Max Perutz and others. Dedicated scientists, producing good work, with sometimes a real scientific breakthrough. On the other hand there is the low quality string: Charles Darwin, Francis Galton, Ernst Haeckel, Karl Pearson, Hugo de Vries, Charles Davenport, R.A. Fisher, Richard Dawkins and others: trying a bit of plagiarism, boosting their publicity, making mediocre work look grandiose, teaming up with wrong political movements, interwoven with themes of white or Nordic or Anglo-Saxon supremacy.

English-American culture is impressive, but the Darwin-Galton streak in it is not. It is this Darwin-Galton atmosphere that Hugo de Vries is eager to be part of.

The Bermuda triangle

The Bermuda Triangle is a myth about the unexplained disappearance of ships and planes in a triangle-shaped part of the Atlantic Ocean. Gregor Mendel seems

to have his own Bermuda Triangle: between the points De Vries, Correns and Tschermak he disappeared in the depth of history.

Mendel's achievement was ill-protected. Secular scientists usually are backed by their university and they have a family that promotes their fame, like the Darwin-clan. Mendel did not have that. Immediately after his death his fellow monks, in loving memory, burned all his notes and papers. His position in the history of science is weak. In the struggle between Church and Science he belonged to the opposite side. The Enlightenment can be described as the process of replacing the obsolete Christian worldview with the worldview of modern natural science. Modern science eagerly wanted to incorporate Mendel's results, but without its clerical author. That made his work prone to theft.

When a scientist finds an important new insight, he will be quick to publish it, before a colleague overtakes him. In 1900, though, something different seems to have happened. Three persons claimed that they discovered the law of heredity, but felt no pressure to publish it, then read Mendel's paper which already contained that law, and then decided it was about time to publish. Comments on this implausible course of events are mainly given by biologists. They are not very revealing. The critical attitude of professional plagiarism research will certainly do better.

The three 'rediscoverers' De Vries, Correns, Tschermak, had distinct connections toward Mendel. As said, Mendel was a Catholic cleric, German-speaking and an Austrian citizen. Closest to that is Tschermak, also a Catholic German-speaking Austrian citizen. Most distant is De Vries, he is (not-practicing) Protestant, Dutch-speaking, and a citizen of The Netherlands. Correns is somewhere in-between. Tschermak would not be inclined to steal from Mendel. Perhaps he made his own 'rediscovery' a little bigger than it was, but he genuinely admires Mendel and he gladly acknowledges Mendel's priority. When in 1906 a committee starts a campaign for a Mendel statue, Tschermak is a staunch supporter. In 1907 he actively invites biologists worldwide to financially contribute to the statue-initiative. And when in 1922 Mendel's 100th birthday is celebrated, Tschermak is present again. The attitude of Hugo de Vries, on the other hand, is completely different. De Vries has no affinity with Mendel, he sees him as an inconvenience, as a misfit in the world of science. De Vries would have the least scruples taking Mendel's insight and presenting it as his own. In 1900 De Vries seems to do exactly that. When he is exposed by Correns, he inserts some polite words about Mendel in the German version of his article, but his sustained dismissal of Mendel in later years casts doubt on the sincerity of those polite words. One De Vries-biographer calls "…the behaviour of De Vries towards Mendel peculiar, if

not hostile" [49]. This hostility is perfectly understandable. De Vries wanted to be Darwin's counterpart. Of the two great pillars of evolutionary theory – genetics and natural selection – Darwin was the icon of natural selection, but who would become the icon of genetics? De Vries wanted that position in the history of science. But when Mendel's article surfaced, he had competition. After all, his own research was disappointing [50], and here was this "medieval" monk from Central Europe with brilliant experiments and a brilliant discovery. De Vries, defending his own ambitions, followed his natural reflexes. First he tried to steal Mendel's results, and when that backfired he sullied him.

Hugo de Vries until today counts as the godfather of Dutch biology, although he died almost a century ago, in 1935. In early 20th century his nickname in The Netherlands was 'Pope of the botanists' [51], referring to his controlling position and character. Whatever his merit in science, De Vries could be an unpleasant person. Many are the stories of colleagues and students who he disliked, who feared his moods, or who left the country to escape his toxic atmosphere [52]. Since De Vries, Dutch biology focuses Westward, toward the UK, USA, Darwinism. Biology-historian Bert Theunissen belongs to this Dutch Darwinist school. Theunissen denies Mendel any credit for heredity. He reasons that every period has its own Mendel laws. Biologists in 1900 have their Mendel laws, biologists in 2000 have different Mendel laws, and because science develops, future biologists will have yet another flavour of Mendel laws. The only one who has no Mendel laws is Mendel: "Mendel did not introduce a revolutionary innovation in genetics. … A Mendelian genetics is not yet visible with Mendel" [53]. After thus having taken away the credit from Mendel, Theunissen credits De Vries for the Mendel laws: "In the history of genetics the role of De Vries is at least as important [as Mendel's]". And "the rediscoverers of Mendel were way ahead of their time" [54]. This last quote is a strange remark. The rediscoverers, instead of being 'way ahead of their time', actually lagged behind 34 years.

Zevenhuizen's 672-page biography of De Vries explicitly refuses to give a valuation of the work and ideas of De Vries. That is somewhat evasive. De Vries lived a century ago, that should be enough distance in time to gauge the relevance of his work. Here is how Zevenhuizen phrases his refusal:

> "It does not matter whether he, measured by modern science, was right or wrong, whether he was sensible or senseless, whether he was on the right track or on a dead end street. Neither will we judge whether his work is still topical or obsolete, whether his contributions to biology were

> important or unimportant, whether he furthered or retarded scientific progress." [55]

When a Dutch biographer of Hugo de Vries refuses to answer all these questions, one can safely assume that the answers are negative. De Vries did good work in plant physiology and popularisation, but he did not make a significant scientific contribution to heredity and genetics. It is revealing to see Garland E. Allen's assessment of De Vries. Allen is arguably the top expert on the history of genetics and eugenics in early 20th century. Being American, he is not hindered by a Dutch bias. Allen's judgment: "De Vries kept defending the generality of his theory until his death in 1935, but by 1915 the mutation theory, especially in its original form, had passed out of the serious biological literature." [56] And with that, De Vries fits in his Darwinist peer group. Darwin, Galton, Haeckel, De Vries, Pearson, Davenport: their contributions to heredity, genetics, selection, natural selection and politics seem questionable.

The history of the life sciences in the 19th century is easily told. In the first three decades French scientists are still leading: Cuvier, Lamarck, Geoffroy St. Hilaire. They are the swan song of the great 18th century French Enlightenment. After that, German science is leading for a century: ca. 1830-1930. But a well-known saying goes: 'History is written by the victors'. Meaning: after the English and Americans won the two World Wars, they started to rewrite the history of the life sciences. Their new narrative, designed after 1945, puts Englishman Darwin in the centre of biology. However, this narrative, communicated by the Darwin Industry, had to tolerate one major non-Darwinian fact: the field of heredity and genetics is initiated by Gregor Mendel, a representative of German science. Mendel is a dissonant in the Darwinian narrative. This dissonant is eliminated after the geopolitical developments of 1989. In that year Michael Gorbachev ends the Cold War. In America many saw Gorbachev's gesture as a surrender: the Soviet Union 'lost' the Cold War and ceased to exist. Consequently, in the English-speaking world the notion grew that now the US was the only Superpower left. Keywords: hegemon, full-spectrum-dominance, end-of-history, unipolar world, Wolfowitz doctrine. Famous America-watcher Noam Chomsky remembers "…the remarkable rhetoric of the decade of triumphalism after the Soviet Union imploded" and "…a period of euphoria after the collapse of the superpower enemy" [57]. In this elated atmosphere of reigning the world, the Darwin Industry felt confident to remove the last non-Darwinian element. Mendel was surgically operated out of their narrative and replaced by staunch Darwinist Hugo de Vries as the first geneticist. The surgery was done in the 1990 decade by people like Dutch Darwinist Bert Theunissen. It completed an all-round Darwinian narrative of biology, the words 'biology' and 'Darwinism' now

being interchangeable. Hence the triumphalist title of Richard Dawkins' 2009 book *The Greatest Show on Earth.* And Darwinism not only dominates Anglo-Saxon biology, it also inspires Anglo-Saxon political thinking. In his resignation speech at 07-07-2022 British Prime Minister Boris Johnson, speaking about the political developments, mentions "…our brilliant and Darwinian system" [58].

Conclusion

There are two plagiarism questions about Mendel, one in 1900 and one in 2000:

- In 1900 three biologists claim independent discovery of a Law of Nature that had been in print for 34 years, a print they all three had access to. How plausible are their claims?
- A century later biology-historian Bert Theunissen claims that this Law of Nature was not in Mendel's paper in the first place, although all three rediscoverers in 1900 recognized that it was and praised Mendel for it. How plausible is Theunissen's claim?

These and some adjacent questions, that were superficially touched on in this preliminary sketch, make a re-evaluation desirable. It is not a case for biologists to judge, certainly not Dutch biologists, still steeped in awe for De Vries. It is a case for a professional plagiarism investigation, although some knowledge of genetics will help.

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NOTES

[1] Sutton, 2017; Sutton, 2022.
[2] Mendel, 1866.
[3] De Vries, 1900.
[4] Stomps describes this conversation with De Vries in several publications and letters. Discussed in De Veer, pp. 200-201. And more extensively in Zevenhuizen, pp. 296-297, 578-579.
[5] Correns, p. 159.
[6] Corcos.
[7] Zevenhuizen, pp. 295-303, 577-582.
[8] Quoted in: De Veer, p. 187.
[9] Leroi.
[10] The Wikipedia-article on Fisher has info and links.
[11] Fisher, 1936, p. 132.
[12] Huxley, p. 28.
[13] Dawkins, p. 33-34.
[14] Theunissen 1997, pp. 121, 109. Repeated in: Zevenhuizen, p. 270.
[15] Theunissen 1997, p. 103.
[16] Treviranus, Dritter Band, p. 224-226.
[17] Oken, p. I-XIV (*Vorrede* = Introduction). For instance p. VIII: "Das Thierreich [ist] der … Embryo des Menschen!".
[18] Unger, p. 344.
[19] Mendel 200 Conference. Link: see 'Literature'.
[20] Shan's lecture at the Mendel 200 Conference. Link: see 'Literature'.
[21] for instance: Ernst Haeckel's booktitle *Anthropogenie oder Entwicklungsgeschichte des Menschen* (1874).
[22] Mendel Web, digital reproduction of Mendel's paper. Link: see 'Literature'.
[23] Shan's personal page on the website of the University of Kent. Link: see 'Literature'.
[24] Zevenhuizen, p. 119. Also: Schrauwers, p. 24-26.
[25] Zevenhuizen, p. 164.
[26] Letter Charles Darwin to Francis Darwin, 17 October 1881.
[27] Letter Charles Darwin to J.D. Hooker, 22 October 1881.
[28] Letter Charles Darwin to Hugo de Vries, 18 October 1881.
[29] Letter Charles Darwin to Julius Wiesner, 4 October 1881.
[30] Reeuwijk, p. 184.
[31] Galton 1865, p. 164-166.
[32] Zevenhuizen, p. 244.
[33] Galton 1908, p. 289.
[34] Schwartz Cowan, pp. IV, V, XVI, 9, 40, 60-62, 181, and the *'Abstract'.*
[35] Zevenhuizen, pp. 244-245, 255-256.
[36] Morgan, p. 156.
[37] Pearson 1912, p. 11.
[38] Pearson 1905. Quotes on pp. 54, 46, 23, 62, 46.
[39] James, p. 360.
[40] Weikart.
[41] Simpson, p. 95, 96.
[42] Dobzhansky, p. 164.
[43] Pearson 1920, p. 455.
[44] Zevenhuizen, p. 485.
[45] Laughlin, chapter 15, pp. 446 ff., Spiro, p. 240, 362. Black, p. 300.
[46] Dr. Joseph Dejarnette, superintendant of Virginia's Western State Hospital, in an interview with the *Richmond Times-Dispatch,* 16 January 1934. Quoted in Black, p. 277.
[47] unpublished autobiography of Leon F. Whitney, written in 1971, in: Leon F. Whitney Papers, p. 204-205, in: American Philosophical Society, Philadelphia. Quoted in Kühl, p. 85. Also in Black, p. 259.
[48] Zevenhuizen, p. 510.
[49] De Veer, p. 186. Also Schrauwens, p. 80, mentions the aversion of De Vries against Mendel.

[50] Theunissen 1997, p. 114. Zevenhuizen, pp. 268, 270-271, 275-276. Schrauwers, p. 74.
[51] De Veer, p. 224.
[52] Zevenhuizen, pp. 420, 463-467. Schrauwers, p. 95.
[53] Theunissen 1997, pp. 101, 120-121. Theunissen 1996, p. 227.
[54] Theunissen 1997, pp. 121, 114.
[55] Zevenhuizen, p. 12.
[56] Allen, p. 124-125 (note 63).
[57] Chomsky, p. 57, 59. And similar on p. 247.
[58] Link: see References > 'Johnson'.

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Beste Ton

Dank je voor het vertrouwen. Ik heb het niet gelezen, maar ik heb wel opgemerkt dat je recente literatuur met belangrijke nieuwe inzichten niet hebt verwerkt. Verder zijn de claims van Theunissen grotendeels de claims van anderen, de referentie die je opvoert van Theunissen is geen origineel wetenschappelijke publikatie en hij gebruikt literatuur van anderen. Daar is trouwens niks mis mee.
De recentste literatuur heeft nieuwe inzichten door nieuwe vondsten, namelijk heel veel correspondentie tussen J.W. Moll en Hugo de Vries en verder onderzoeksaantekeningen van Hugo de Vries. De verwijzingen zijn:

Ida H. Stamhuis, Onno G. Meijer and Erik J.A. Zevenhuizen, 1999: 'Hugo de Vries on Heredity, 1889-1903: Statistics, Mendelian Laws, Pangenes, Mutations', *Isis* 90, 238-267

Ida H. Stamhuis, 1995: 'The "Rediscovery" of Mendel's Laws Was Not Important to Hugo de Vries; Evidence from his Letters to Jan Willem Moll', *Folia Mendeliana* 30, 13-30. This journal issue appeared in 1997

Dan is er ook nog:

Ida H. Stamhuis, 2013: 'Why the Rediscoverer Ended up on the Sidelines: Hugo De Vries's Theory of Inheritance and the Mendelian Laws', *Science & Education*, DOI 10.1007/s11191-013-9668-4. Published in *Science & Education*, 24, Issue 1 (2015), 29-49.

Ik stuur de tweede referentie digital mee, want dat tijdschrift is niet zo coulant. De rest wel, voor zover ik weet.

Groeten
Ida Stamhuis

The comment of Ida Stamhuis, written in Dutch, essentially says two things :
-- Munnich's critical remarks about Bert Theunissen are not justified.
-- Munnich neglects recent literature, being three Stamhuis-publications.
Dr. Ida Stamhuis is an associate professor History of Science at the Vrije Universiteit Amsterdam (retired) and the editor of *Centaurus,* the official journal of the European Society for the History of Science (retired).
Ton Munnich

Dear Ton

Thank you for sending me your interesting article about Mendel and the Darwinians. Several years ago, I read an essay by the Australian philosopher David Stove, so I already was aware that the Darwinian mindset is rather unscientific. From your article I now extract that it is even worse than I suspected.

After carefully reading your article, I would like to draw your attention to a few points of consideration:

1.
You refer to Natural Selection as 'the disappearance of the less fit'. I consider this a rather strange expression, although it is often referred to as such. I am not sure whether Darwin formulated it this way. 'Survival of the fittest' is the more common, albeit controversial expression. Nevertheless, it should be noted – as explained in my book *Darwin Revisited* – that Natural Selection is better understood as 'differential reproduction', because it is about the success with which organisms produce offspring. Those leaving the most offspring will make up future generations. Your definition 'disappearance of the less fit' suggests that Natural Selection only retains what is already there, a continuation of what exists. It does not consider a 'Höherentwicklung'. There are interesting books about this, e.g. by John Davidson (online under 'Evolutionary Manifesto').

2.

Why was Mendel ignored for more than 30 years? His findings did not fit the 'Zeitgeist'. Mendel demonstrated that genetic characteristics and traits do not just accidentally and unpredictably show up in a population; rather heritable traits followed laws that could be predicted, quantified and calculated. In other words, Mendel discovered a quantum theory of heredity. We now know that quantized traits are explained by what Johanssen called 'genes' and that his laws are predominantly due to mutations that disturb and/or damage genes. Mendel's dominant property is the functional gene, the recessive property is the damaged (inactive, non-functional) gene[1]. A functional gene can compensate for a damaged gene and therefore seems dominant[2]. When a descendant inherits a damaged gene from both parents, the trait that is specified by that gene completely vanishes. Mendel called the damaged gene 'recessive' and the active gene 'dominant'. It can be understood from genetic redundancy and backup systems of sexual reproduction, which always involves two genes (one from both parents). That is why Mendel's laws only apply to sexually reproducing organisms. It also implies that genetic information is 'frontloaded' and refutes the secular vision of the genome.

– note 1 : described in my book *Darwin Revisited*

– note 2 : see my latest article for *Studium Integrale Journal* (in press)

3.

You write that Mendel's paper is about evolution. In my opinion, this notion does not stand up to the facts mentioned above. Mendel´s genetic laws are inherent to diploid sexually reproducing organisms. Mendel's laws, demonstrating that variation appears in predictable ratios, are very much in accord with competing evolutionary ideas of the 19th century: Nomogenesis, in which variation of characteristics in species is confined within certain limits due to internal and external factors. This biological view, always reviled by the Darwinians, appears to be the correct description of evolutionary processes. Mendel´s laws underline Nomogenesis. Gregor Mendel himself also fits in the Christian tradition of scientists who understood the God of the Bible as the Creator of the universe: orderly, organizing, and legislative. The Darwinians do not accept the observation that Mendel's laws can be understood with the concept of degeneration (mutations that break the function of genetic information). Although Darwinism may have originated as a scientific attempt to explain the origin of species, in our days it has merely become a pseudo-scientific exercise for those who reject creation.

Those then were my few additional commentaries on your article, which as a whole I find a particularly worthwhile contribution to historical scholarship.

Best regards,
Peter Borger, MSc, PhD
(Peter Borger is a molecular biologist. He worked at the universities of Sydney, Basel and Zürich)