

## TWINS. LESSONS FROM THE PAST



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### Abstract

*In the history of civilization twins always fascinated, but initially they were treated as a freak of nature. Relatively recently the first scientific attempts were made to elaborate this theme and in the 50s of the 20th century the first national register of twins was created (Danish). Currently, there are many of such databases and they are an excellent source for a various analyzes, including the incidence and risk factors of genetically determined diseases, among others congenital heart defects. This paper presents a historical, sociological and medical aspects connected with the fascinating world of twins.*

**Key words:** *multiple births, history of medicine, milestones in neonatology*

The viewer who is not familiar with the history and the context of the image of Frida Kahlo *Las dos Fridas* might say that it is a perfect illustration of the conference: "Fetal cardiac problems in twins" organized in Lodz in October 2014. But this is a misinterpretation. Such a logical error we can also find in an attempt to interpretation of "the twin paradox", the theory presented by Albert Einstein in 1905. Let's say that we have twins, male twins. One of the brothers remains on the Earth, and the other makes a journey by the rocket into the space. After some time he comes back, lands on the Earth and meets up with his twin brother. According to the theory of special relativity in a moving reference frame time flows more slowly. Therefore, the twin-brother who remained on the Earth, expects that his brother-cosmonaut after returning to the Earth will be younger than him. But from the point of view of the twin-cosmonaut- it is brother, who remained on the Earth representing a moving reference frame, that's why he also expects that his twin brother is younger than him - cosmonaut. Of course, both brothers at the same time cannot be right ("the twin paradox"). But is a significant difference in age between twins really possible? In a modern perinatology almost everything is possible. It concerns obviously a delayed interval delivery, as was in the case recently registered in the US, where one of the boys was born in winter and the second one - in spring, so the difference between the twins was 24 days...

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Twins always fascinated people, mainly due to their similarity. This similarity has been the subject of many themes in literature and art, for example in the *Comedy of Errors* by Shakespeare. Parents of William Shakespeare were closely related (his grandmothers were sisters). In

1585r. Mrs Shakespeare gave birth to twins: Hamnet and Judith (boy and girl). So the children were different in appearance, but it is the similarity of twins that has become a leitmotif and the axis of the history in the *Comedy of Errors*, as in this passage:

*A joyful mother of two goodly sons,*

*And, which was strange, **the one so like the other***

*As could **not be distinguished but by names.***

*That very hour, and in the selfsame inn,*

*A meaner woman was deliverèd*

*Of such a burden, **male twins, both alike.***

Shakespeare couldn't have dreamed of such a case of twins of different races, of different skin color. Even more fortune had the British parents who twice had the twins with different skin color.

In 1856 in Paris Juliusz and Zofia Kossaks expected birth of their first child. Unfortunately, they had a problem: two men wanted to be the Godfather: one of them was Count Jan Działyński, owner of the town Kórnik (near Poznań).

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And the second one was Horace Vernet, an eminent French painter of battles, teacher and master of Juliusz Kossak. Young parents were faced with a dilemma: Which one of these men should they chose? What decision should they make? Both men were friends of Juliusz Kossak. Moreover: the first one (Vernet) helped Kossak to develop his careers and the second one (Działyński) provided him financial contribution by buying Kossak's pictures, i.e. portraits of horses from Działyński's stud farms. As Wojciech Kossak (son of Juliusz, born in these days in Paris) recalled after many years, his parents were in trouble, situation was awkward and difficult. They analyzed pro and contra. Endly they made no decision, they remained in a state of problematic suspension. The fate made a decision- instead of Kossaks. *Tertium non datur*?... In Paris New Year's Eve, while shooting champagne corks the Kossak Twins were born. Two identical boys one before midnight, and the second after midnight, the next year. So identical twins with completely different date of birth! In this case, we also have an example of the stigma of godparents: Tadeusz was held to baptism by the landowner Jan Działyński and Tadeusz Kossak became a landowner, Wojciech was held for baptism by Horace Vernet and Wojciech Kossak became a famous painter of battles, the author of *Panorama Racławicka* which we can admire in Wrocław. Both Kossaks were for the rest of their life so extremely similar that biographers often have problems with their distinguishing on the photos. Interestingly, sometimes the same date of birth is attributed to the daughters of Wojciech Kossak- i.e. Maria Pawlikowska-Jasnorzewska and Magdalena Samozwaniec what makes them twins while 3 years was the distance between them ...

Transplant history is inextricably linked with the twins. Description in the 50s of the transplant rejection phenomenon and a lack of immunosuppressive drugs indisposed the achievement of a successful transplant outcomes, despite the defeat of technical difficulties. The way to avoid this problem was to make the operation in the monozygotic twins. The first successful transplant from a living donor was a kidney transplantation which was performed in 1954 in a hospital in Boston. The operation lasted 5.5 hours. Richard and Ronald Herrick were 23 years old. An organ donor - Ronald - made the life of his brother longer on 8 years. Operating team was led by Drs Murray and Merrill, who a few years later reported 7 cases of twins with kidney transplant. Dr. Murray was awarded the Nobel Prize in 1990. Ronald Herrick (i.e. the donor twin) died four years ago at the age of 79 years. In 1996. sisters Jackson were born in the University Hospital in Massachusetts. Their story was a lesson, after which the model of management have been changed forever not only in this hospital but also in many others in the USA. Twins were born at 28 week of gestation, both sisters weighed approx. 900g. After birth, in accordance with procedures, these premature twins were placed in two separate incubators. After a few days the state of one of the twins deteriorated sharply. A nurse contrary to

procedures transferred one of the twins to the incubator of the siblings in an unstable state. Twins survived, and their photo signed *Rescuing Hug* circulated throughout the press worldwide. Even today papers are published showing the benefits of doing so in the case of twins, i.e. the benefits of the so-called "co-bedding" of twins.

The fascination with twins as freaks of nature quickly turned into attempts to create a science. The first national registers of twins were created. The oldest registry is a Danish database (*The Danish Twins Registry*, started in 1954). It analyzes the twins born between 1870-1910. Currently, it covers more than 65,000 pairs of twins. Initially, this database included only twins, both of which survived to the age of six, and since 1931 this register keeps track of the fate of the two twins. It analyzes among others factors associated with cardiovascular diseases for example congenital heart defects in twins or twins with the implanted stimulator. Nigeria is a very interesting country for geneticists - it is Africa's most populated country with 110 millions people. The incidence of the twins in this area of West Africa is at least several times higher than in other regions of the world. In Igbo-Ora- town in the south west of Nigeria- the world's highest incidence of twins was recorded. In Yoruba people (the largest ethnic group in Nigeria), women drink a decoction of yam (*Dioscorea*), rich in phytoestrogens and this is probably the cause of this phenomenon. In addition, when twins are born, Yoruba sculpte twin figures in which souls of children live. When one the twin dies, the second one take care of the statue of died, which gives him immortality.

Birth of twins in celebrities always aroused a media sensation. An interesting example of this type of situation is a film director Milos Forman (*Flight Over the Cuckoo's Nest, Amadeus*). Milos Forman's wife bore him twins. He divorced with her after 35 years of marriage and remarried with his next wife. But fate sometimes perverse. Another wife also bore him twins... Another shock survived one married couple who discovered they are twins separated at birth. A court had to annulle their union due to this unusual close relationship...

In 1878 Stéphane Tarnier - widely known and respected French obstetrician - while strolling paths of the Paris Zoo noticed the heated boxes for the chicks of exotic birds. He came up with the idea to pose in such heated stalls (properly ventilated and large enough) prematurely born children. In 1880, the so-called "*couveuse*" (fr. "sitter") was first used in a Paris hospital Maternité. By using these simple devices a mortality among infants weighing less than 2000g decreased by almost half within two years at the hospital Maternité. Dr. Martin Couney was the heir to the idea of Prof. Tarnier. In 1896, at the ongoing world exhibition in Berlin he organized an exposure of prematurely born infants in incubators. It was a small risk for these children, their fate was sealed, such a small babies had little chance of survival. The unusual name of the entire project ("*Child Hatchery*") raised the imagination not only of Berliners.



Figure 1. The example of co-bedding of twins newborns delivered at term (from author's collections)

Crowds of curious people came to pay one german mark for admission to look at this remarkable phenomenon: living, small babies lying in the glass incubators. Also, from a medical point of view, this extraordinary show was a success - all children survived, to the surprise of many observers. Since then, Martin Couney earned the nickname "Doctor Incubator". Long before the closure of the Berlin exhibition a British impresario came to Couney with an interesting proposition of a repetition of the show in London during the exhibition which was held there (Victorian Era Exhibition). But when Dr. Couney arrived it turned out that the conservative British doctors do not want to hire him the local prematures to prevent *British*

premature infant to be placed inside a *French* incubator. Dr. Couney quickly returned to Paris, where Pr. Pierre Budin showed him several dozen of premies and said: "You may take that you want". Couney returned from France to England on board of a ferry with a specific luggage: "three washbaskets full of French prematures". Every day incubators were visited by 4 thousands of people. Similar expositions were held in the USA, where Dr. Couney went: in 1898 (Omaha Trans-Mississippi Exhibition) and in 1901 (Buffalo). Martin Couney settled on Coney Island in 1903. And the same year he opened his first permanent exhibition at the amusement park on Coney Island (Luna Park). For the next 40 years he organized expositions of premature babies in incubators. Admission cost was 25 cents. Couney's daughter Hildegard was born prematurely and spent the first 3 months of her life in an incubator, who was also an exhibit. She was a nurse and worked with her father. According to the "New York Times" of 1904 three pairs of twins were on the list of Couney's prematures in this time. Recently, the same newspaper published an interview with George and Norma Johnson, twins born in 1937. Being elderly people they took a sentimental trip to

the places they spent the first weeks of life in incubators of Dr. Couney. There is little data about the hero of this remarkable chapter in the history of medicine. Problems arise already at his date of birth. An interesting fact is that the various sources suggest Wroclaw (Breslau) as the place of his birth. The last public display of premature infants in incubators was held in 1940. Martin Couney died 10 years later. Since the end of the 19th century, when he for the first time publicly showed children in incubators, he had been taking care of about 8,000 prematures- it is estimated that among them incredibly big number survived : over 6500. The smallest of those who survived, weighed only 705 grams. Martin

Couney asked about the fate of his pupils once said: "I get letters every year from people who their parents told them they were raised in my incubators. I never yet got a letter from a jail...".

May 28, 1934 - Canadian farmer Oliva Dionne noted the deterioration of the state of his 26-year-old wife, whose seventh delivery was predicted in two months. Twins were expected. The house was very modest, with no running water, no electricity. The father brought his wife's aunt, who was a midwife, and sensing the approaching of complications - ran after Dr. Dafoe, a country doctor. When they returned together they saw three tiny newborn babies. Soon, another two children were born ... Quintuplets were born at 33 week of gestation, together weighed only 5.5 kg. According to the Hellin's formula quintuplet pregnancies are expected to occur in approx. 1:54 million. Chance for survival more than a few days for Quintuplets Dionne - in 1934 - was even more smaller. The first antibiotics were available only in the 40s. The limit for survival was considered 1500 g and the largest of the sisters weighed only 1250 grams. Martin Couney (Doctor Incubator) received an offer to take care of these children, but he refused due to the responsibility for the thirty premature babies left on the show in Chicago. But it was just an excuse. Martin Couney was quite sure that quintuplets have no chance of survival. Never before in the history of civilization quintuplets survive more than a few days. And there was no indication that now it will be a different case. After years Martin Couney said: "I was wrong like bigger men than I am." After the birth, the children were baptized, bathed in warm olive oil and laid in a wicker basket borrowed from neighbors. This basket was posed on two chairs in front of the open fire and hot blankets draped around the chairs form a sort of an open incubator. Dr. Dafoe issued the instructions: keep warm blankets and leave children alone in peace. The survivor was to be fed every two hours 1-2 drops of sweetened hot water and rum. Their mother was unable to feed the girls because after the delivery she developed the symptoms of shock, she was in a critical condition. In March 1935, the authorities of the province of Ontario established a protectorate of quintuplets. The document "Dionne Quintuplets Guardianship Act" established five guardians (including Dr. Dafoe) until the 18th birthday of Quints "to protect them and ensure the advancement, education and welfare" because "they are the only known living quintuplets and as such are therefore of special interest to the Canadian people and to people of other countries". It was actually a termination of the parental rights. "Quintland" was built for them, a sort of Disneyland. During the first 2 years of Quints life the Ontario province earned 20 million dollars. The phenomenon of Quintuplets Dionne saved the entire region from bankruptcy in the economic crisis in the 30th of 20.century. "Quintland" became a tourist Mecca. Daily 6000 people watched the girls. Quintuplets Dionne became a tourist attraction

bigger than Niagara Falls. The study of researchers at the University of Toronto showed that mother of quintuplets was actually right awaiting the birth of twins. Originally there were 6 embryos developed from a single fertilized egg through its successive divisions (repeated twinning). One embryo decreased. In 1943, Dionne sisters eventually returned to their parents. But in this story there was no a happy end - a real family had never been created. Elzire Dionne after Quints was mother another three times, she gave birth to three boys. She died at the age of 77 years. She survived the death of her two famous daughters: 20-years-old Emilie died in 1954 due to epilepsy and 36-years-old Marie died in 1970 due to a hemorrhagic brain stroke. In 2001 Ivonne died from cancer. Annette and Cecile (now 80-years old) are living in the suburbs of Montreal. After years Dionne sisters stated that they has been abused by the world. "It was not human. It was a circus" - said Cecile Dionne in 1995. She gave birth to twins (boys). 1998 - it's the date of the end of a process that three living sisters Dionne brought against the Canadian authorities. For this lesson of humility the Canadian government has paid a compensation of 2,800,000 dollars.

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#### Conflict of interest

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