



Dollhopf

600 Years in the Baking

Pedigree Collapse: When Cousin Marries Cousin.

Johann Dollhopf's parents were cousins.

When Johann's father, also named Johann Dollhopf, married Margarethe Bär on November 11, 1856, he married his third cousin.¹

When I first discovered this 30 years ago, I was still plotting the family tree by hand on paper, drafting dotted pencil lines to connect generations. That was before genealogy software.

I couldn't believe what I saw. Johann and Margarethe were third cousins. I was thinking, man, I could have been Einstein, but instead I'm the result of cousin marriage. Hillbillies!

I double checked this anomaly against church records again and again, thinking this couldn't be right.

But it was. Over the years, as I entered more and more of Johann's and Margarethe's ancestors – over 1,500 – into my new software, I discovered that not only did Johann marry his third cousin, but Margarethe was also his fourth, fifth, sixth, seventh, eighth, and ninth cousin as well. Many times over. A cousin conundrum.

And this, I was also to discover, is normal.

This is what population experts call pedigree collapse, or in German, *Ahnenschwund*.²

Most people have two parents, four grandparents, eight great-grandparents, etc. The number of grandparents is calculated by 2^n , where n = the number of generations distant from you. Your parents are one generation away from you, so the calculation for the number of parents you have is $2^1 = 2$. Obvious. Your grandparents are two generations removed from you, so the calculation for the number of grandparents you have is $2^2 = 4$, great-grandparents are the 3rd generation, so $2^3 = 8$, and so on.

Our oldest known Dollhopf ancestor is Hans Dollhopf (born about 1407-died about 1460) – our 15th great grandfather. At the fifteenth generation, we should have 2^{15} , or 32,768 great-grandparents. But, according to land records in the Mistelbach region for the years around 1400, there were only about 150 houses in Bayreuth, far



Albert Einstein and his second wife (and first cousin), Elsa Einstein, took family marriage to a new level. They were related through both maternal and paternal lineages: Their mothers were sisters and their fathers were first cousins. Wikimedia Commons

¹ Johann Dollhopf (1830-1858) and Margarethe Bär (1829-1891) are our great-great-grandparents, both born and died in Mistelbach. Their son Johann emigrated from Mistelbach to America in 1871.

² *Ahnen* = ancestor; *schwund* = atrophy or collapse.

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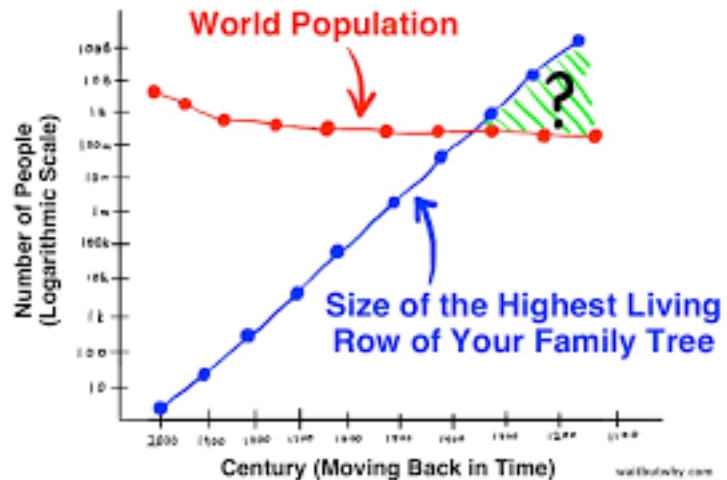
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fewer in Mistelbach, probably only 20 or 30. The entire region of the Hummelgau³ probably had *at most* one to three thousand people. How could we have over 32,000 great-grandparents?!

And if we go back 30 generations, about the year 1100 AD, we should have 2^{30} or 1,073,741,824 – over *one billion* great-grandparents in that 30th generation alone. But 30 generations ago, in the year 1100, there were only 10 million people in all of Germany, and about 300 million people on the *entire* planet. How could we have 1 billion great-grandparents?

It is explained by pedigree collapse.

Pedigree collapse occurs when a cousin marries a cousin. I have not yet encountered first or second cousin marriage in our tree, but more often than not third cousins or higher married. The Roman Catholic Council of Trent issued a decree in 1653 that required local parishes to record marriages, in part to prevent consanguineous marriage.⁴ Thus the church could track relationships – especially husbands, wives, second husbands and wives, and first cousins, etc. – to obey Church ordinances.



Beyond first cousins though, I can't imagine that medieval parish pastors tracked second, third, or higher cousins, although they could probably figure it out. But if it wasn't against church dictates, then it was of no consequence to track.⁵

Until the 1800's and the great European migration, people generally married someone within walking distance. A peasant, in his or her lifetime, rarely traveled more than a few days in any direction. In very small villages and rural areas people married within the village, and thus likely a cousin. But they probably wouldn't know it. In the Middle Ages, when most peasants didn't read or write, families did not keep records, only the parishes did. They probably knew their immediate first or second cousins, but they would have no knowledge of a distant third- or higher-degree cousin. Even today we *might* know our second cousins, but very few people could actually identify or name a third cousin. Can you name your third cousins? Do you know what a third cousin is?

This is how pedigree collapse works: if two people (who are not cousins) marry, their children have four grandparents, eight great-grandparents, 16 great-grandparents, etc. But if two people who are first cousins marry, then they obviously share two grandparents. That's the definition of first cousins – two people who share the same grandparents. The children of married first cousins would still have four grandparents, but they would only have three sets of great-grandparents, not four, since their mother and father shared one set. They would have six great-grandparents, not eight.

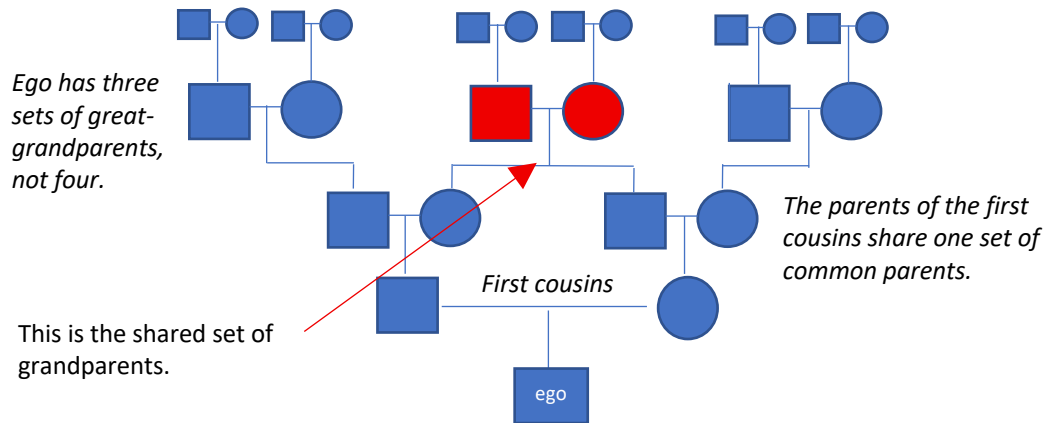
³ The Hummelgau is a distinctly cultural region of 64 villages that includes Mistelbach.

⁴ Consanguineous = descended from the same ancestor. The Roman Catholic Church, based on Roman civil law, banned consanguineous marriage of the fourth degree, meaning first cousins or closer (parent/child, brother/sister, uncle/niece, etc.). It did not ban marriages of second or third cousins or higher.

⁵ Interestingly enough, in the US today, it *is* legal to marry your first cousin in 26 states, although the practice is not widespread. Scientists believe that there is extremely little genetic risk in marrying a cousin. So there goes the Einstein theory....

Pedigree Collapse:
When Cousin Marries Cousin.

Now imagine if cousins married cousins married cousins. The more often that cousins marry cousins, generation after generation, the fewer and fewer grandparents they have. The family tree “collapses.”



In this chart, ego's parents are first cousins. The first cousin parents share a set of grandparents. Ego thus has six great grandparents, not eight; and 12 great-great-grandparents, not 16 – the family tree just got smaller, or “collapsed.”

Population experts posit that our family trees expand exponentially (2,4,8,16,32...) as we travel back in time from the present to about the 1200s – that is, most people alive today had the maximum number of their ancestors alive at one time in the 1200s. Before the 1200s our trees begin to collapse, and, I might add, at a dramatic rate.

When Johann Dollhopf married Margarethe Bär, they were not only 3rd cousins, they were cousins 29 times over.

Beginning in the late Middle Ages, as populations began to explode,⁶ people traveled greater distances before they married. The migration from farm to city in the Industrial Age also decreased the likelihood that cousins would marry.

When, for example, a villager from a farming community like Mistelbach traveled to the “big city” of Nürnberg, 50 miles away in the 1600s to work on a new-fangled printing press, he or she was far less likely to marry someone who was related.

When Johann (John) Dollhopf traveled to America, the probability that he would marry a cousin was infinitesimally smaller – unless he found someone from his German hometown in America. This would of course seem like a real stretch, but it wouldn't be totally impossible – Johann Dollhopf's fifth cousin, Conrad Dollhopf, traveled to America and lived only two blocks away from Johann on Spring Hill!

Here is the result of cousins marrying cousins: The following chart lists the 61 different ways that I am related to my sister Kristin Dollhopf. In parentheses are the common ancestors. For example, you will note that in relationship #2 below, Kristin and I are seventh cousins. In this instance Stephan Bär and Helena Schiller are the common ancestors, our 7x-great-grandparents.

⁶ Populations exploded in the Late Middle Ages because better farming, political stability, expanding trade, favorable climate, and improved nutrition combined to reduce death rates and support larger families.

Relationship of siblings Kristin Dollhopf to Mark Dollhopf⁷

1. Sibling (Roland Dollhopf & Audrey Schilpp)
2. Seventh cousin (Stephan Bär & Helena Schiller)
3. Seventh cousin (Stephan Bär & Helena Schiller)
4. Eighth cousin (Conrad Kauper & Magdalena Nützel)
5. Eighth cousin (Conrad Kauper & Magdalena Nützel)
6. Ninth cousin (Hans d.J. Hagen)
7. Ninth cousin (Georg Adam Goldfuß & Cunigunda Roder)
8. Ninth cousin (Georg Adam Goldfuß & Cunigunda Roder)
9. Ninth cousin (Hans d.J. Hagen)
10. Ninth cousin once removed (Johann Goldfuß & Barbara Schamel)
11. Tenth cousin once removed (Hans Böhner & Catharina Schmidt)
12. Tenth cousin once removed (Hans Ruckriegel & Anna Bamberger)
13. Tenth cousin once removed (Hans Ruckriegel & Anna Bamberger)
14. Tenth cousin (Hans Ruckriegel)
15. Tenth cousin (Hanß Schabtag & Anna NN)
16. Tenth cousin (Jobst Hauenstein & Barbara NN)
17. Tenth cousin (Johannes "Lang" Böhner & Elisabeth Bernreuther)
18. Ninth cousin once removed (Johann Goldfuß & Barbara Schamel)
19. Tenth cousin (Jobst Hauenstein & Barbara NN)
20. Tenth cousin (Hanß Schabtag & Anna NN)
21. Tenth cousin (Johannes "Lang" Böhner & Elisabeth Bernreuther)
22. Tenth cousin once removed (Simon Hauenstein & Barbara Holl)
23. Tenth cousin once removed (Simon Hauenstein & Barbara Holl)
24. Tenth cousin (Simon Hauenstein)
25. Eleventh cousin (Maria Sporer)
26. Eleventh cousin (Hanß d.Ä. Nützel & Felicitas NN)
27. Eleventh cousin (Hans Bamberger)
28. Eleventh cousin (Fritz Angerer & Elisabeth Seyferth)
29. Eleventh cousin (Hans Ruckriegel & Anna Bamberger)
30. Tenth cousin once removed (Hans Ruckriegel & Anna Bamberger)
31. Eleventh cousin twice removed (Hans Ruckriegel & Elisabeth NN)
32. Eleventh cousin (Hans Bamberger)
33. Eleventh cousin once removed (Hans Hagen & Catharina Adler)
34. Eleventh cousin once removed (Georg "Huter" Schmidt & NN NN)
35. Eleventh cousin (Simon Hauenstein & Barbara Holl)
36. Tenth cousin once removed (Simon Hauenstein & Barbara Holl)
37. Tenth cousin once removed (Hans Böhner & Catharina Schmidt)
38. Eleventh cousin (Simon Hauenstein & Barbara Holl)
39. Tenth cousin once removed (Simon Hauenstein & Barbara Holl)
40. Eleventh cousin (Hanß d.Ä. Nützel & Felicitas NN)
41. Eleventh cousin (Hans Ruckriegel & Anna Bamberger)
42. Tenth cousin once removed (Hans Ruckriegel & Anna Bamberger)
43. Eleventh cousin once removed (Johann Schamel & M Nützel)
44. Eleventh cousin (Maria Sporer)
45. Eleventh cousin (Fritz Angerer & Elisabeth Seyferth)
46. Twelfth cousin once removed (Hans Nützel & NN NN)
47. Twelfth cousin (Cuntz Meyer & Elisabeth NN)
48. Twelfth cousin (Albert Fasold & NN NN)
49. Twelfth cousin (Cuntz Meyer & Elisabeth NN)
50. Twelfth cousin (Hanß Hofmann & NN NN)
51. Eleventh cousin once removed (Georg "Huter" Schmidt & NN NN)
52. Twelfth cousin (Hanß Hofmann & NN NN)
53. Twelfth cousin (Albert Fasold & NN NN)
54. Eleventh cousin once removed (Johann d.Ä. Schamel & M Nützel)
55. Twelfth cousin once removed (Caspar Ringel)
56. Eleventh cousin once removed (Hans Hagen & Catharina Adler)
57. Thirteenth cousin (Hans "der Alte" Böhner & NN NN)
58. Eleventh cousin twice removed (Hans Ruckriegel & Elisabeth NN)
59. Twelfth cousin once removed (Caspar Ringel)
60. Thirteenth cousin (Hans "der Alte" Böhner & NN NN)
61. Twelfth cousin once removed (Hans Nützel & NN NN)

Another word of explanation: "once removed" means that, as cousins, we are separated by one generation. For example: the child of my first cousin is my first cousin once removed (not a second cousin as most people think). My children, and my first cousins' children, are second cousins. This is illustrated in the chart on the following page.

The grandchild of my first cousin is my first cousin *twice* removed. My grandchild, and my first cousins' grandchild, are third cousins.

You will also note that in relationship #3 above, Stephan Bär and Helena Schiller are again listed as 7x-great-grandparents, and indeed they are our 7th great grandparents *twice*. Two of their daughters – Catharina Bär (1727-1798) and Kunigunda Bär (1729-1788) were *both* our 6x-great-grandmothers, because their descendants four generations later, as 3rd cousins, would marry. As you can see from the above, this occurred often.

Almost all of our ancestors in Mistelbach – going back as far as we have accurate records – married a cousin of some degree. This is the case for most of the human population today. We all came from villages. Genetics experts estimate that 80% or more of our ancestor grandparents married cousins.

⁷ In the following list "NN" stands for "No Name" meaning that the name of that spouse – almost always women – was not recorded in the church records. Alas, women had no legal standing in the Middle Ages and hence it was thought there was no need to record their names.

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When Cousin Marries Cousin.

When cousins marry cousins many times over, we become related to other immediate family members in more ways than one. If I marry my cousin, then our children would not only be brothers and sisters, they would also be second cousins! If a third cousin marries a third cousin – their children would not only be brother and sister, but also fourth cousins.

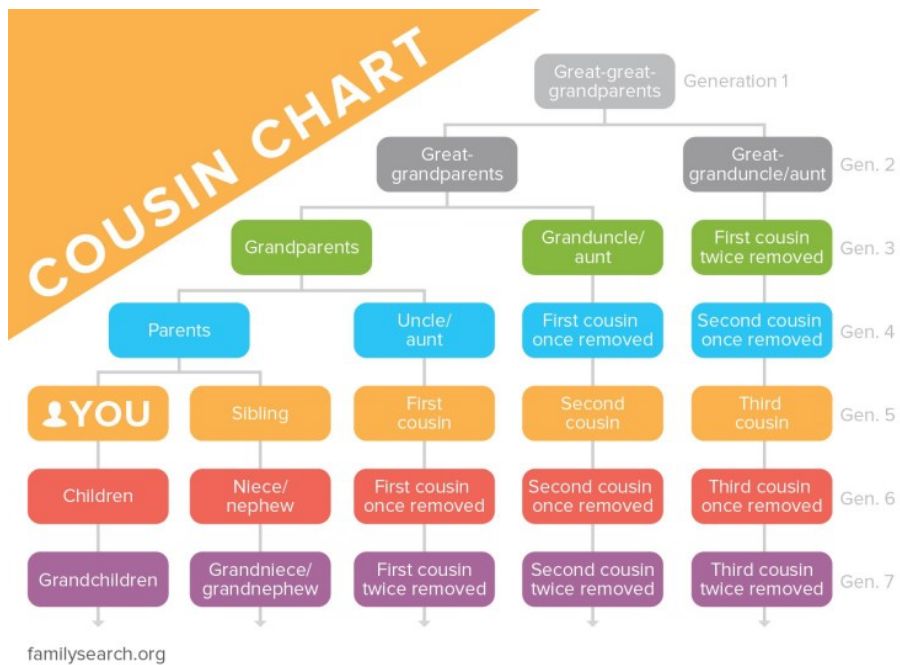
Over many generations it becomes even more complicated when, for example, someone marries a person who is a third cousin, and a fifth cousin, and a seventh cousin! Their children are now related as brother and sister, and fourth, sixth, and eighth cousins!

You are now an expert in family relationships.

Riddle me this:

1. If I marry my first cousin, then my children would not only be brother and sister, they would also be _____.⁸
2. If a third cousin marries a third cousin, their children would not only be brother and sister, but also _____.⁹
3. Extra credit: If two first cousins marry; their children’s father is also their _____.¹⁰

To put this into greater perspective, the above illustration of the interrelatedness between my sister and me is only from *one* small agricultural region, the Hummelgau and the village of Mistelbach. I have seven other great-grandparents who also came from European villages. They would also likely exhibit the same degree of pedigree collapse, depending, of course, on the size of the village. Most came from rural farming villages, but I have two ancestors whose origin is unknown, likely Ireland, Scotland, or England. If they came from a relatively large city, or if for some reason their ancestors migrated, then the pedigree collapse would not be so great.



Cousins explained. Begin with YOU in the left column and follow the gray lines... "Removed" means separated by a generation. If you are twice removed you are separated by two generations, etc.

⁸ Second cousins.

⁹ Fourth cousins.

¹⁰ Uncle!

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We could continue to play the cousin game, but the point is this: that during *most* of human history, when humans traveled in small tribes of no more than 20 to 50 people, cousins “married”¹¹ cousins, if not brother and sister.¹²

When they began farming, and settling into larger groupings of villages, about 8000 BC, they continued marrying cousins, but later with certain religious prohibitions.

The Biblical book of Leviticus, for example, written about 500 BC, describes marriage prohibitions. In the Roman period there were civil law restrictions on marrying cousins, and as mentioned above, the Roman Catholic Church codified prohibitions in the Middle Ages. There were similar prohibitions in other world religions.

There was an initial population explosion in the Middle Ages that was later tempered by famine, plague, and war, but then a renewed explosion in the 1800s was caused by improved economic conditions.

In the 1800s there were massive immigrations to the New World. The more they – like our ancestor John Dollhopf – traveled, the more likely they were to marry someone *other* than a cousin, and hence family trees expanded rapidly.

As far as I know, I followed the rules. My wife is not my cousin.

But if we go back far enough...genetics experts theorize that any two random persons on earth are cousins within a degree of 50.

That is, no two persons on earth are more than 50th cousins.

We are all family.

Mark R. Dollhopf
New Haven, CT
May 2020
In anno corona virum.



I, Johann, take thee, Margarethe, to be my lawfully wedded fourth cousin. These peasant costumes are from the Frankische Schweiz, or “Franconian Switzerland,” the region that includes Mistelbach.

¹¹ “Mated” would be a more accurate description than married.

¹² Humans (*homo sapiens*), according to the latest research at the time of this writing, have been around for about 300,000 years. They only started living in villages about 10,000 years ago. Before then, as a hunter-gathering society they moved around in small bands or 20 to 50 people.