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## **President's Address**

### **Twinning in Families of Triplets**

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**Abstract.** A study was conducted on twinning in relatives of consecutive triplet sets in the Åland Islands in the years 1740-1939. The incidence of twinning in sibships of triplets was extremely high, 80/1000 (56/1000 before and 143/1000 after the triplet maternity). In Finland as a whole, 1905-1954, the twinning rate was among mothers of triplets 38/1000, ie, about 2.6 times the rate in general population, and was higher after (48/1000) than before the triplet maternity (34/1000). In the sibships of fathers of triplets there was a low rate of twinning (below 10/1000) both of same-sexed (SS) and of opposite-sexed (OS) triplets. Among sibships of mothers of OS triplets the twinning rate was 18/1000 and among mothers' sibships of SS triplets 26/1000. The series of triplet families from both Åland and Finland as a whole indicate a considerably higher frequency of twinning on the maternal than on the paternal side. The sibships of OS triplets in Finland have higher twinning rates than sibships of SS triplets (50/1000 vs 27/1000). In sibships of triplets, not only the DZ but also the MZ twinning rates were approximately twice as high as those in the general population. The triplet rates in Finland were increasing strongly with maternal age and were in the last century among mothers of 30-39 years of age considerably higher than among mothers from this century. This, in combination with higher mean parity, may explain the high rates of multiple maternities in sibships of triplets in the past. The rate of triplet maternities seems to be more sensitive to sociodemographic changes than the rate of twin maternities. Mothers of triplets in Finland had a high frequency (more than 40%) of prenatally conceived firstborn children. This, and a short protogenetic interval indicate that triplet-prone mothers are more fecundable, ie, they conceive with greater ease and/or may have a better physical condition than other women for completing a gestation with multiple embryos.

**Key words:** Fecundity, Inheritance of multiple maternities, Triplets, Twinning, Åland Islands, Finland

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## INTRODUCTION

The understanding of the causes of human twinning has been made difficult by the limited studies on unselected families with multiple maternities. Since the 1960s there has been an increased use of ovulation stimulants. The spontaneous rate of triplet maternities is low, in white populations about 1:10,000, but the use of ovulation-induction agents has been reported to increase the frequency of triplet pregnancies to 1:1,696 [30]. In a recent survey of triplet pregnancies in Linköping, Sweden, 1973-1981, half of the women had used ovulation-induction agents. There are reports that up to 25% of twin maternities and up to 80% of triplet maternities followed the use of ovulation stimulants, compared with only 2% of singleton births [14, E. Papiernik, personal communication, 1989]. *In the future it will be more difficult to differentiate between families with induced and spontaneous multiple maternities.*

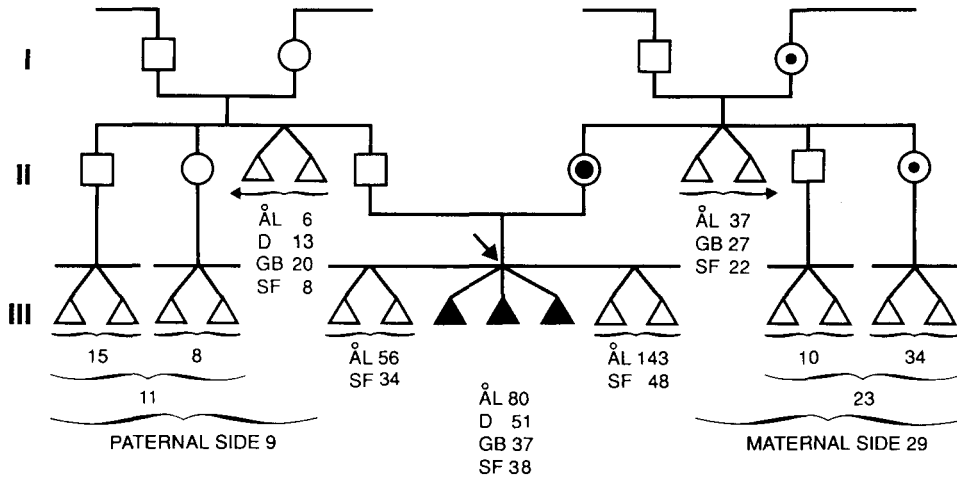
A priori one would expect that the familial incidence of twinning should be more pronounced in families with triplets. So far, very few studies on twinning among relatives of triplets have been made and the famous scientists Wilhelm Weinberg [32,33] and Sir Ronald Fisher [20] came to rather different conclusions in their studies on twinning in families with triplets.

This paper presents results on twinning in relatives of consecutive triplet sets born in the Åland archipelago during two centuries and some preliminary findings on the incidence of multiple maternities in siblings of these triplets and in sibships of the parents of triplets born 1905-1954 in the whole of Finland. Both Åland and Finland have among the highest noted triplet rates in the world [16,26].

## MATERIAL AND METHODS

During the period 1653-1949 there were 106,624 maternities registered in Åland and among these 2048 ( $19.2/1000 \pm 0.4/1000$ ) twin maternities and 40 ( $0.375/1000$ ) triplet maternities. It was possible to follow each family of the 33 triplet sets born during the period 1740-1939 among the Swedish speaking Åland Islanders [16]. In the local parish archives (books of births and deaths) we studied the twinning rate in parental siblings, in sibships of triplets and among cousins of triplets (Fig. 1).

In Finland as a whole during 1905-1954 there were 4,200,636 maternities with a twinning rate of  $14.75 (\pm 0.07/1000)$  and with 661 sets of triplets ( $0.157/1000$ ). So far in 427 of these families of triplets we have been able to get information from the local registrars' offices for genealogical studies in local parish archives, headed by the clergy (Lutheran ministers). In the beginning of the 1950s more than 95% of the population in Finland was affiliated with the Lutheran national church. The reproduction performance of women has been followed at least to the age of 50 or to death. Emigrated relatives of triplets have not been followed. The genealogical and demographic data (dates of birth, incl. stillbirths, marriage and death, parish of birth) have been processed on computer.



Population	Period	Number of mothers of triplets	Twinning rate in population	Source
Åland	1740-1939	33	19.2	This study
D Germany	1795-1907	429	13.2	Weinberg 1909
GB Great Britain and Ireland	1917-1920	100	11.0	Fisher 1928
SF Finland	1905-1954	427	14.7	This study

Note: A recurrent triplet maternity counted as one twin maternity.

Fig. 1. Schematic pedigree showing rounded-off incidences of twinning per 1000 among relatives of triplets in Åland in comparison with German, British and Finnish populations.

## RESULTS

### Triplet Families in Åland

In the Åland archipelago the twinning rates were extremely high among the offspring of mothers of triplets (Table 1 and Fig. 1), being 56/1000 before and 143/1000 after the triplet maternity, on average 80/1000, over four times the frequency of the twinning rate in the general population in Åland during 1740-1939, ie, 19.2/1000 ± 0.4/1000 [16].

On the maternal side the incidence of twinning was above 30/1000, except in the offspring of the brothers (Fig. 1: II, 7) of the mothers of the triplets (9.9/1000). The maternal grandmothers of triplets (Fig. 1: I, 4) had among their offspring a twinning rate (37/1000) that was nearly twice that in the general population and almost 6 times that among paternal grandmothers. On the paternal side the incidence of twinning was low in all sibships, on average only 8.8/1000, ie, not even half of the average twinning rate in Åland.

**Table 1 - Incidence of twinning among relatives of the 33 triplet sets born in Åland, 1740-1939**

A kind of relatives	Singletons		Twin pairs			Total maternities	Sex ratio of singletons	Total offspring <sup>a</sup>						
	M	F	MM	MF	FF			Total /1000	M	F	Total	Sex-ratio		
1. Triplets' siblings	78	83	161	6	5	3	14	80.0	175	94.0	93	96	189	96.9
2. Fathers' sibships	90	65	155	1	1	1	1	6.4	156	138.5	91	66	157	137.9
3. Cousins from fathers' brothers	37	30	67	1	1	1	1	14.7	68	123.3	38	31	69	122.6
4. Cousins from fathers' sisters	60	57	117	1	1	1	1	8.5	118	105.3	62	57	119	108.8
5. Total paternal side (2-4)	187	152	339	1	2	2	3	8.8	342	123.0	191	154	345	124.0
6. Mothers' sibships	74	108	182	2	2	5	7	37.0	189	68.5	79	117	196	67.5
7. Cousins from mothers' brothers	45	55	100	1	1	1	1	9.9	101	81.8	47	55	102	85.5
8. Cousins from mothers' sisters	55	59	114	4	4	4	4	33.9	118	93.2	63	59	122	106.8
9. Total maternal side (6-8)	174	222	396	5	2	5	12	29.4	408	78.4	189	231	420	81.8
10. Paternal & maternal side (5&9)	361	374	735	6	2	7	15	20.0	750	96.5	380	385	765	98.7
11. Total (1,5,9)	439	457	896	12	7	10	29	31.4	925	96.1	473	481	954	98.3

Note: In the parental sibships are the fathers resp. mothers included. If the 32 known fathers are excluded, the sex ratio is 89 instead of 138. If the 33 mothers are excluded, the sex ratio is 94 instead of 68. The number of offspring on the maternal side is 22% higher than on the paternal side.

<sup>a</sup> Including twins but excluding triplets.

The whole maternal side showed on average a high twinning rate, 29.4/1000, and the number of offspring was 22% higher than on the paternal side. However, one of the 33 fathers of triplets was unknown. If the paternal and maternal sides were pooled, the twinning rate was 20.0/1000, ie, about the same as in the general population for this period in Åland.

In the offspring of the 33 mothers of triplets on Åland (1740-1939) there was – in contrast to the offspring of mothers with recurrent twinning – a high incidence of same-sexed (SS) twin sets among the recurrences, ie, 57% monozygotic (MZ) twin sets. According to Weinberg’s differentiation method the estimated proportion of MZ twin maternities in total Åland, 1653-1949, was only 14.4% [16].

The SS triplet sibships on Åland had a higher twinning rate (93.3/1000) than the opposite sexed (OS) (61.7/1000 – see Table 5).

One third of the triplet sets born on Åland were born to the 136 mothers with repeated multiple maternities in 1750-1939 [16,19]. Only 2 sets of triplets were born among the 93 mothers with repetition of twinning in Stuttgart, 1795-1907 [33: p. 324].

### Triplet Families in Finland

Among siblings of SS triplets for Finland as a whole there was a relatively high incidence (36.7/1000) of twin maternities born after the index triplet sets (Table 2). Also in

**Table 2 - Incidence of twinning in among relatives of 196 same-sexed (3M or 3F) triplet sets born in Finland, 1905-1954**

Kind of sibships	Total maternities	Twin maternities							Recurrent triplet maternities
		Number				Twinning rate/1000			
		MM	MF	FF	Total	Total	MZ	DZ	
1. Born before triplets	653	2	6	6	14	21.4	3.0	18.4	–
2. Born after triplets	327	5	4	3	12	36.7	12.2	24.5	–
3. Triplets’ siblings (1-2)	980	7	10	9	26	26.5	6.1	20.4	–
4. Fathers’ sibships	815	2	4	2	8	9.8	0.0	9.8	–
5. Mothers’ sibships	836	3	10	9	22	26.3	2.4	23.9	–

Note: DZ, dizygotic and MZ, monozygotic twin maternities estimated according to Weinberg’s differential rule. “Triplets’ siblings” exclude the index triplet maternities. “Fathers’ sibships” include the father of the triplets. “Mothers’ sibships” include the mother of the triplets. 980:196 = 5.0 other maternities per mother of same-sexed triplets.

mothers' sibships the twinning was relatively high, 26.3/1000. However, in fathers' sibship the incidence of twinning was low, 9.8/1000.

In sibships of the OS triplets (Table 3) there was a considerably higher incidence of recurrent multiple maternities than in the siblings of the SS triplets. Also among the siblings born before the triplets there was a high twinning rate (45.5/1000). Also by including only twin maternities there were relatively high values (38.2/1000) which are increasing (to 50.0/1000) if also a repeated triplet maternity is included and counted as one twin maternity.

**Table 3 - Incidence of twinning among relatives of 231 opposite-sexed (2M + 1F or 1M + 2F) triplet sets born in Finland, 1905-1954**

Kind of sibships	Total maternities	Twin maternities						Recurrent triplet maternities	
		Number				Twinning rate/1000			
		MM	MF	FF	Total	Total	MZ		DZ
1. Born before triplets	703	8	11	7	26	37.0 <sup>a</sup> 45.5 <sup>b</sup> 54.1 <sup>c</sup>	5.7	31.3	6
2. Born after triplets	318	8	3	2	13	40.9 <sup>a</sup> 59.7 <sup>b</sup> 78.6 <sup>c</sup>	22.0	18.9	6
3. Triplets' siblings (1-2)	1021	16	14	9	39	38.2 <sup>a</sup> 50.0 <sup>b</sup> 61.7 <sup>c</sup>	10.8	27.4	12
4. Fathers' sibship	851	2	3	1	6	7.1	0.0	7.1	-
5. Mothers' sibship	796	2	4	8	14	17.6	7.5	10.1	-

Note: See footnote to Table 2. Sibships with two triplet maternities were counted twice, in accordance with Weinberg's sib method.

<sup>a</sup> Only twin maternities included.

<sup>b</sup> One recurrent triplet maternity included as one twin maternity.

<sup>c</sup> One recurrent triplet maternity included as two twin maternities.

Among the sibships of fathers of OS triplets there was a low twinning rate (7.1/1000) but in the sibships of mothers the twinning rate was higher (17.6/1000).

In the pooled series of sibships of SS and OS triplets (Table 4) the DZ twinning rate remained low in comparison with the total twinning rate, particularly among the siblings born after the triplets (the estimated MZ twinning rate being as high as 17.1/1000).

In the sibships of the fathers of triplets the twinning rate is low (8.4/1000) and in the sibships of the mothers of triplets it is 22.1/1000 (Fig. 1). In the sibships of the parents of triplets the estimated proportion of MZ twins is not increased.

DISCUSSION

It is of interest to note that among paternal relatives of triplets the twinning rate is only about half of that in general population both in Åland (about 9/1000) (Table 1, Fig. 1), and in Finland (8.4/1000, Table 4). This and the low frequency of twinning among cousins from mothers' brothers are in agreement with the most commonly accepted hypothesis for inheritance of tendency for multiple maternities, ie, a sex-limited recessive gene for the propensity for twinning [for review, see 8].

Table 4 - Incidence of twinning among relatives of 427 triplet sets born in Finland, 1905-1954

Kind of sibships	Total maternities	Twin maternities						Recurrent triplet maternities		
		Number				Twinning rate/1000		Total	MZ	DZ
		MM	MF	FF	Total	Total	DZ			
1. Born before triplets	1356	10	17	13	40	29.5 <sup>a</sup> 33.9 <sup>b</sup> 38.3 <sup>c</sup>	4.4	25.1	6	
2. Born after triplets	645	13	7	5	25	38.8 <sup>a</sup> 48.1 <sup>b</sup> 57.4 <sup>c</sup>	17.1	21.7	6	
3. Triplets' siblings (1-2)	2001	23	24	18	65	32.5 <sup>a</sup> 38.5 <sup>b</sup> 44.5 <sup>c</sup>	8.5	24.0	12	
4. Fathers' sibship	1666	4	7	3	14	8.4	0.0	8.4	-	
5. Mothers' sibship	1632	5	14	17	36	22.1	4.9	17.2	-	

Note: See footnote to Tables 2 and 3.

2001:427 = 4.7 other maternities (or about 7 children) per mother of triplets.

<sup>a</sup> Only twin maternities included.

<sup>b</sup> One recurrent triplet maternity included as one twin maternity.

<sup>c</sup> One recurrent triplet maternity included as two twin maternities.

*High Incidence of MZ Twinning among Relatives of OS Triplets?*

Among sibships of mothers of OS triplets in Finland the twinning rate was 17.6/1000, ie, lower than among mothers' sibships of SS triplets (26.3/1000). This was a surprise because one should expect that the twinning rate would be higher among sibships of mothers of OS triplets than of SS triplets. Both Weinberg [33] and Bulmer [8] assumed that the increase in the twinning rate in relatives of triplets in Württemberg was confined to the DZ component. However, in the sibships of OS triplets in Finland the DZ component is relatively low (Table 3) but the estimated MZ component is much higher than



in general populations. It is unexpected that the estimated rates of MZ twinning are higher among mothers of OS (multizygotic) triplet sets, but not among the mothers of SS triplets, which to 33% would be MZ triplet sets [1,8,32].

#### *How to Classify Recurrent Triplet Maternities?*

Among the sibships of OS triplets there are, beyond the 39 sets of twins, also 6 repeated triplet maternities. Bulmer [5] commented: "Triplets were counted as 'non-twin' maternities" but Fisher [20] was of the opinion that a triplet maternity is equivalent to two twin maternities. We have counted one triplet maternity as one twin maternity and by recurrent triplet maternities Weinberg's proband (sib) method has been used. In Tables 3 and 4 all three methods are used, which demonstrates that there may be rather large differences depending on the method.

Another practical problem is how to classify the zygosity of repeated triplet maternities. One would expect that about 17% of the sets of triplets would be MZ [1,2,6,8]. According to Weinberg's differential method only 13.9% of the 599 Finnish triplet sets were MZ [26] and with polysymptomatic tests (anthroposcopies, blood groups, dermatoglyphics) on the 76 surviving complete sets of Finnish triplets, the proportion of MZ triplets was only 4.0% [27]. Thus, a high incidence of MZ triplets cannot explain the high proportion of MZ twins in the sibships of triplets in Finland.

Siblings born after the OS triplets (Table 3) are showing a much higher frequency of estimated MZ twins than one would expect, about 4/1000. However, the numbers are small, and for incidence numbers in which the 6 recurrent triplet sets have been included in the estimates, it is supposed that they have no effect on the zygosity distribution (3 of the 6 recurrent triplet sets were OS).

Among OS triplet sets one would expect about 3 times more trizygotic triplets as among SS triplets, 50% vs 17% [1,6,8,33]. This difference in zygosity distribution of the index triplets may explain the considerably higher total twinning rate in the sibships of OS triplets than in the sibships of SS triplets, 50.0/1000 vs 26.5/1000.

#### *Familial Aggregation of Twinning of Both Types?*

It is a surprise that the estimated MZ twinning rate is as high as 11-23/1000 in the sibships of OS triplets. If this trend of high rates of MZ twinning can be confirmed in larger series it would support the hypothesis that not only the propensity to have DZ twins but also the tendency for MZ twinning is increased in mothers of OS triplets. It is widely held that MZ twinning is due not only to a tendency to random division, but also to a hereditary factor which can be inherited from both the father's and the mother's side [eg, 9-13,20-22].

Studies by Parisi et al [28] indicate that there is a paternal role in DZ but not in MZ twinning and that a propensity to MZ twinning, as well as one to DZ twinning, can be inherited through the maternal line, and that the two mechanisms of MZ and DZ twinning might be related.

Recently, a potential resolution was offered by way of a mechanism common to MZ and DZ twinning, involving a relationship between oocyte organization and determination of body symmetries [4]. Our findings are in agreement with other family studies [21, 23-25,31] even though in some of these studies the number of the investigated families

was relatively small and, at least in some cases, biased selection for family history of twinning (interesting accumulation of twinning, a selfselected sample of respondents, exclusion of families with unwilling parents) cannot be excluded. Furthermore, the pedigree information was often obtained only through interviews and not always checked by archive studies.

Our results so far indicate that the inheritance of twinning may not be confined only to its DZ component or that Weinberg's differential rule holds not true in families (mothers) with repetition of multiple maternities. Weinberg reported in 1909 [33: Table II, p. 328] on the incidence of twinning in sibships of triplets. To the best of our knowledge he has, however, never commented on the distribution of the sex-combination of the 126 twin pairs in his large series of 429 sibships with triplet sets (218 OS and 211 SS). It remains a mystery why Weinberg never applied his own differentiation rule to these sets of twins. We have taken measures to obtain Weinberg's original triplet sibships in Württemberg but our attempts so far have not been successful.

**Table 5 - Twinning rate among offspring of mothers of triplets**

Population (source)	No. of index families	No. of further maternities (mean)	Twinning rate/1000			General population
			Among offspring of mothers of triplets			
			SS	OS	Total	
Germany, Württemberg c. 1808-1900 [32]	356	2227 (6.267)			55.2 (59.7)	13.5
Germany, Württemberg c. 1808-1907 [33]	429 (50.8) <sup>a</sup>	2633 (6.14)	40.7	59.8	50.5	13.2
England & Ireland, 1917-20 [20]	100 (66.0) <sup>a</sup>	493 (4.93)	41.7 (53.6)	21.5 (40.0)	36.5 (44.6)	11.0
Finland, 1905-54	427 (54.1) <sup>a</sup>	2001 (4.66)	26.5	50.0 (61.7)	38.5 (44.5)	14.7
Åland, 1740-1939	33 (54.5) <sup>a</sup>	175 (5.30)	93.3	61.7	80.0	19.2

Note: A further triplet maternity has been counted as one twin maternity. Twinning rates in brackets indicate that one repeated triplet maternity has been counted as *two* twin maternities (a method used by Fisher [20]).

<sup>a</sup> Percentage of opposite-sexed triplet index families.

### Comparisons of Twinning Rate Among Offspring of Mothers of Triplets in Different Populations

Table 5 shows that the rate of twinning was considerably higher in the Württemberg series (above 50/1000) than in the triplet series from the United Kingdom or Finland (around 36/1000). The average number of other maternities per mother (maternities of

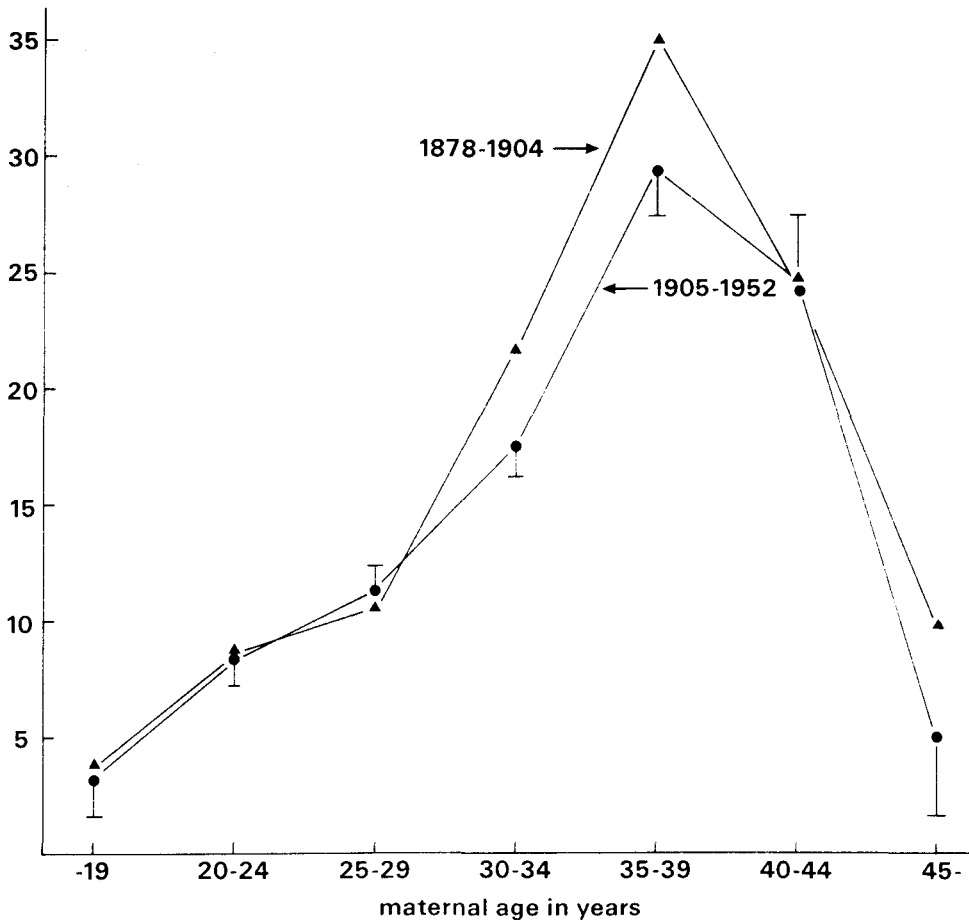


Fig. 2. Age-specific rates of triplet maternities per 100,000 maternities in Finland during 1878-1904 and 1905-1952.

triplets excluded) was higher in Württemberg (around 6.2) than in Finland (4.7). The main cause of these differences seems to be that the Württemberg series were from an earlier period (c. 1795-1907) than the Finnish (1905-54). Not only the mean parity but also the average maternal age may have been considerably higher in the Württemberg series. No less than 26.6% of mothers of triplets in Württemberg had 10 or more maternities. This percentage in the Finnish series was barely 15%. This difference in maternal age and parity distribution may have accentuated considerably the incidence of other multiple maternities (repetition of twinning) in the Württemberg series, even if the twinning rate in the general population was lower in Germany than in Finland. In Finland – as in many other countries in Western Europe – the fertility transition started during the last decennia of the 19th century. The data by Pitkänen [29] implies that the educated people (with exception of the clergy) adopted the practice very rapidly in the late 19th

century, but the practice did not extend to other groups – at least not to any perceptible amount – until the 1910s when the practice of family limitation spread rapidly to most part of Finland and in the cities also in a wide social context. Fisher followed the mothers only 6.5 years after the triplet maternity. Therefore, the rate of recurrent multiple maternities in the sibships of British triplets may have been higher than reported.

The Finnish series of triplet sibships are showing much better agreement with Fisher's series from 1917-1920 in England and Ireland with an average sibship size of 4.9 other maternities. However, the incidence of twinning was reported to be rather high, 45/1000 on the British Isles but only 36/1000 in Finland. But Fisher [20] used another method, counting "triplets as equivalent to the production of twins twice (for, in addition to the production of twins, a second fission or additional ovulation must have occurred)". If a further triplet maternity is counted as only one twin maternity there is good agreement between the values for the twinning rates among mothers of triplets in the values of the British (36.5/1000) and the Finnish series (35.5/1000).

In the British and Ålandish series the twinning rate among offspring of mothers of SS triplets was higher than among offspring of mothers of OS triplets (see Table 5). But this may be a coincidence because the considerably larger series from Germany and Finland show a much higher twinning rate in the sibships of OS triplets than of SS triplets.

Also in the sibships of the fathers and mothers of the triplets relatively low rates of twinning were noted in the Finnish series, 8.4/1000 and 22.1/1000, vs 20/1000 and 27/1000, respectively, found by Fisher in Great Britain (see Fig. 1). In the sibships of 180 fathers of triplet maternities in Württemberg, Weinberg [32] stated a twinning rate of 13.4/1000. Fisher [20] noted among offspring of sibs of fathers of triplets a twinning rate around 13/1000 and among offspring of sibs of mothers of triplets 12/1000, thus on the maternal side a considerably lower twinning rate than in Åland (Table 1).

The twinning rate is very high (80/1000) in the sibships of triplets in the Åland Islands but the general twinning rate has been very high (above 20/1000) in this archipelago population up to this century [16].

It may be concluded that the twinning rate among mothers of triplets was up to the beginning of this century 3 to 4 times the rate in general population. However, the Finland series from this century has a value of only around 2.6 times the twinning rate in the general population.

### Triplet Rate According to Maternal Age in Finland

The triplet rate is increasing much more strongly with the maternal age than the twinning rate, being 8-10 times higher in the age group of 35-39 years than below 20 years of age (Fig. 3). Mothers of the age group 35-39 are 3 times more triplet-prone than mothers of 25-29 years of age. This finding is in conformity with the considerably higher rate of multiple maternities after the index triplet maternity than before.

The triplet rate was in the past (1878-1904) higher among the mothers between 30 and 39 years than during the later period, 1905-52. This may be caused by a higher mean parity during the last century and would also explain the high rate of recurrent twinning in Weinberg's series in Table 5.

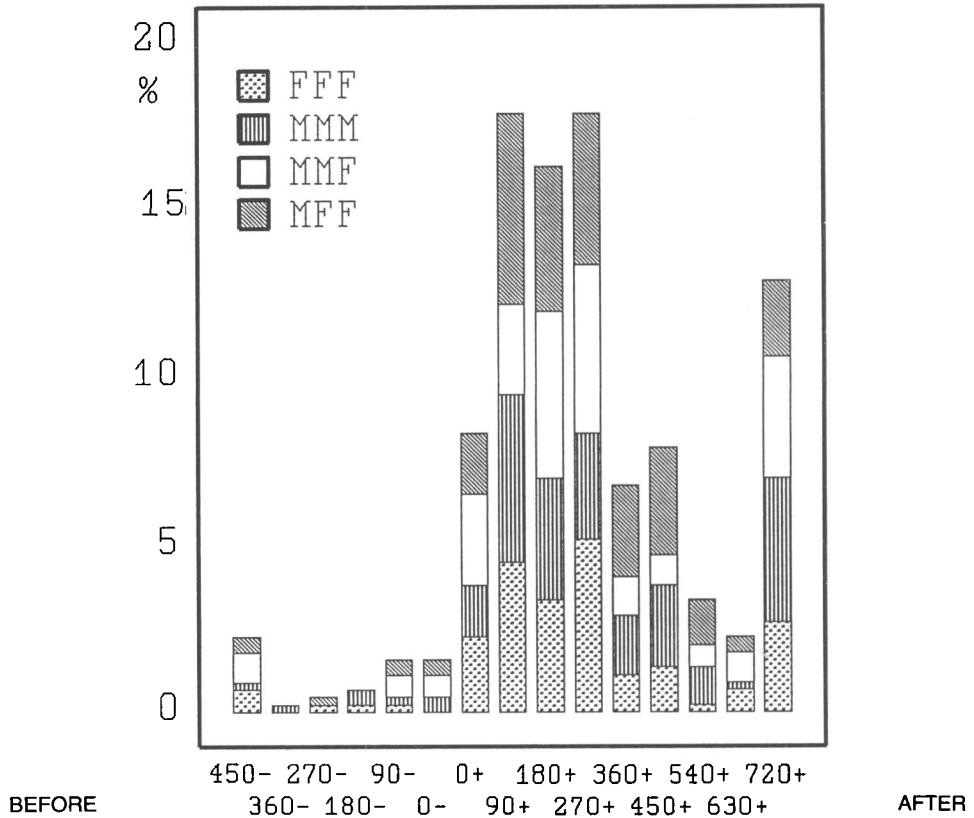


Fig. 3. Comparison of percentage distribution of 444 mothers of different triplet sets in Finland, 1905-1954, according to the duration of marriage (in days) at the birth of the firstborn child (pro-trogenetic interval). 0- indicates that the first child of a mother of triplets was born 0-89 days before and 0+ indicates born 0-9 days after the marriage, etc.

It seems that the sociodemographic changes have had a much stronger effect on the triplet rates than on the twinning rates. In Sweden the twinning rate was in the 1960s hardly 60% of what it had been 200 years earlier (about 17/1000). But a corresponding fall to only 30% occurred in the rate of triplet maternities (from about 3 to below 1 per 10,000 maternities) [16]. Similar long-term changes in liveborn triplet rates have been noted in the USA [2].

### Fecundability of Mothers of Triplets

Fig. 3 demonstrates that about 7% of the mothers of triplets had their first child before marriage (extramarital maternities). During 1901-1960 the illegitimate live births in the general population of Finland were around 6-7%. More than 42% of the firstborn chil-

dren of mothers of triplets were born before nine months of marriage duration, ie, a great deal of firstborn children were conceived before marriage. The average duration of marriage in Finland was below one year at the birth of the first legitimate liveborn child in around 20% (varying between 15.6% to 24.0% during 1945 to 1954). This percentage is considerably lower than among mothers of triplets, who in more than 60% of cases had their firstborn child before one year's duration of marriage.

Our results show that mothers of triplets are at a high proportion premaritally pregnant. One might speculate that there is a selectivity process at work here, in that women who are highly fecund and or less motivated to prevent a premarital conception are more likely to find themselves in a situation where they "have to" get married not seldom at an early age. Since our preliminary results indicate a positive relationship between premarital conception of first birth and completed family size, it would seem that associated with and probably reinforced by an early unwanted pregnancy is less ability (higher fecundity) and/or less motivation to control further child-bearing.

There is evidence that also the mothers of twins are more fecund than mothers in general [16-18]. The high incidence of maternities conceived before marriage and the fact that more than 80% had their first child within two years' marriage, indicate that mothers of triplets are more fecund, and, therefore, are less able to avoid becoming pregnant. The relatively high number of offspring and the high rate of recurrent multiple maternities indicate that the mothers of triplets comprise an elite from the standpoint of reproduction. They become pregnant more easily owing to an increased tendency to polyovulation – and may be also to polyembryony – and may have better physical qualifications, on the average, for completing a pregnancy with multiple embryos. Both the quadruplet and triplet rates [26] and the age-specific twinning rates are significantly higher in rural than in urban areas of Finland [16]. It may be that, owing to better general physical condition, mothers who live in the countryside may have lower rates of miscarriages, including prerecognition losses, because they are better fit to carry through pregnancies, and particularly gestations, with multiple embryos [15,16].

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