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Excessive Twinning in a Rural American Genealogy: The Demographic Pedigree

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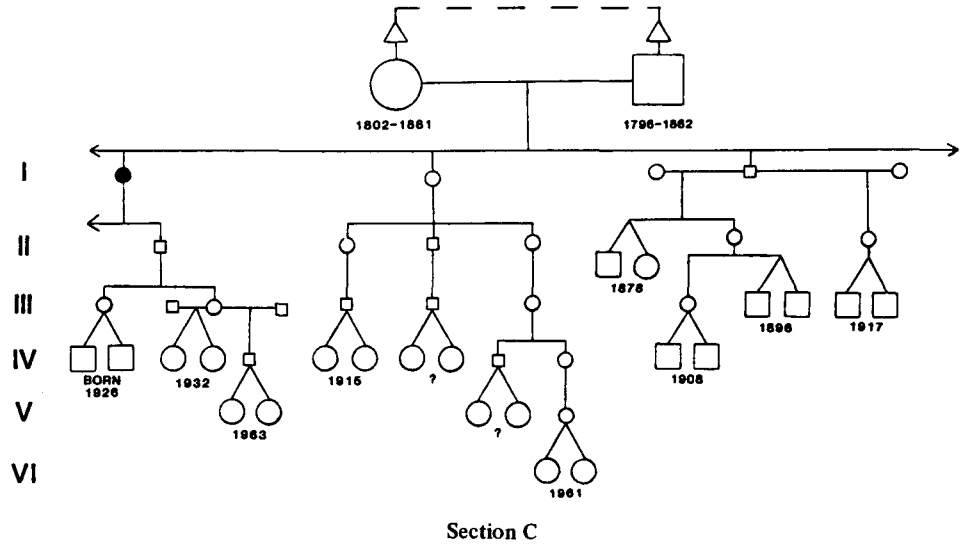
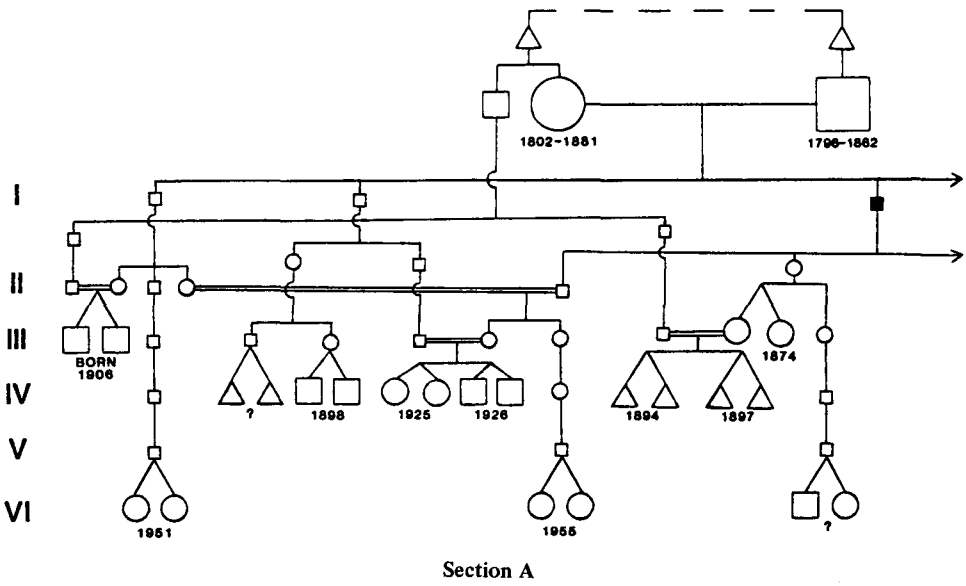
Abstract. Excessive twinning in an extended family of rural Missouri concentrates in the isolated generations of 1874-1930s. Moderate inbreeding, larger sibships to older mothers, and access to local doctors may have combined to enhance this familial twinning. These biosocial factors are similar to an isolated case of excessive twinning in Scotland.

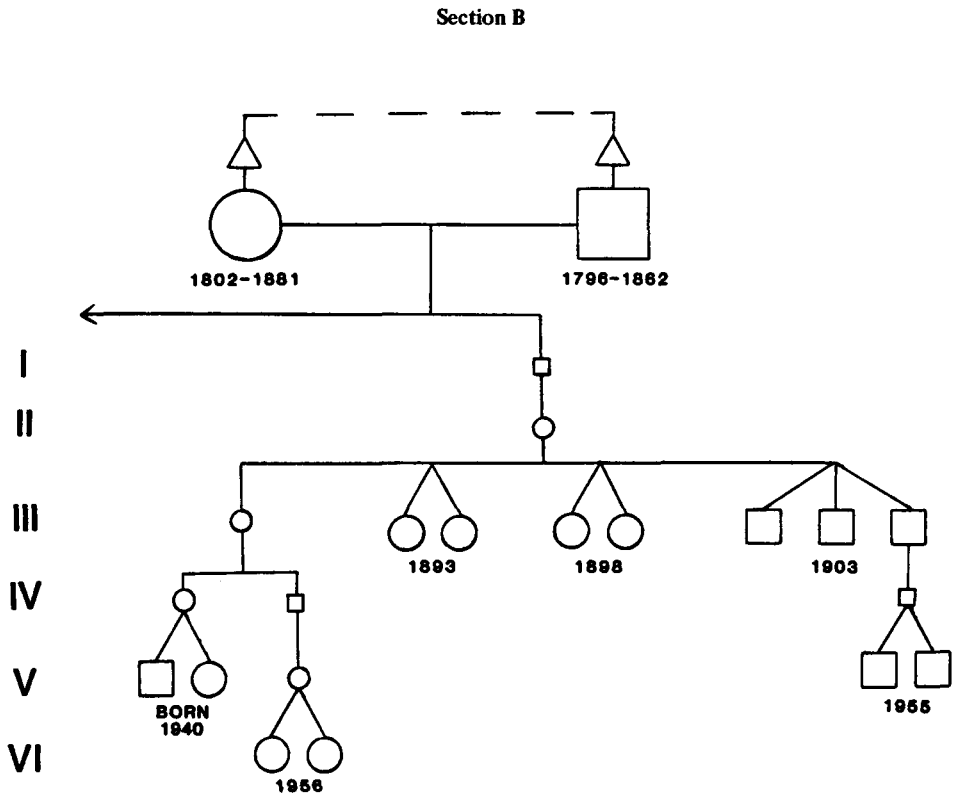
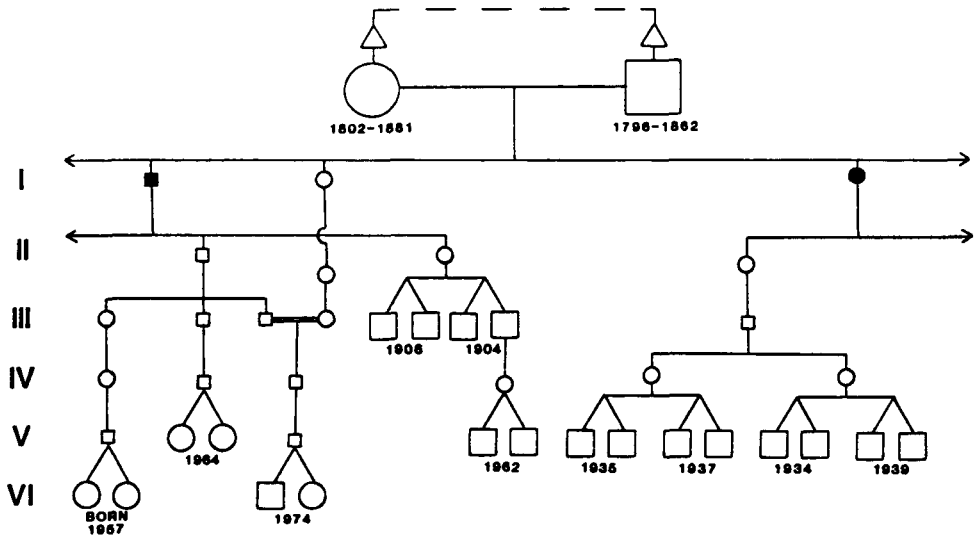
Key words: Excessive twinning, Missouri founders, Inbreeding

As first presented [3], an extensive family genealogy of 1,693 descendants from rural Missouri has an overall rate of twinning of 2.2%. Weinberg's differential rule estimates the level of monozygosity in this sample at 61-83%.

Further analysis by pedigree construction reveals that the twins concentrate in the great - and great - great - grandchild generations from the family "founders", reputed to be first-cousins from post-revolutionary Kentucky (Generations III and IV of the Table and the Figure). The family genealogy records 36 twin sets and one triplet set born during 1874-1974; a 37th twin set was added during interviews with family members. One of 89 grandchild maternities produced twins, 1.2% in Generation II. Then, 3.2% in Generation III and 2.5% in Generation IV are twin maternities. Generations V and VI do not have excessive twinning; these twins occur in smaller sibships to younger mothers and may be random events of a scattered, modern extended family.

Generations III and IV of the genealogy reflect an extended family still settled in the isolation of rural Missouri well before World War II. Five of the twin sets (born 1894, 1897, 1906, 1925, 1926) are inbred from $1\frac{1}{2}$ to $2\frac{1}{2}$ cousin relationships. Four sibships have more than one multiple birth and two of these four are inbred. The average age of





Figure, Parts A-D. Minimal pedigree of twins born to extended family of North Missouri, USA. (Shaded individuals are identical in previous or next pedigree section).

Table - Demographic information for Missouri twins

Generation	Year of birth	Sex	Parental inbreeding	Birth order	Mother's age at birth
II. = 1.2%	1878	MF*		5 of 5	34
III. = 3.2%	1874	FF*		2 of 4	29
	1893	FF		4 of 8	29
	1898	FF		6 of 8	34
	1903	MMM		8 of 8	39
	1896	MM*		6 of 9	32
	1904	MM*		3 of 5	37
	1908	MM*		5 of 5	41
	1906	MM	2c.	4 of 4	39
	1917	MM		4 of 4	28, x = 33.6
	IV. = 2.5%	1894	??*	2 1/2c.	1 of 3
1897		??*	2 1/2c.	2 of 3	23
1898		MM		2 of 5	26
1908		MM		4 of 9	24
1915		FF		10 of 11	38
1925		FF	1 1/2c.	8 of 10	31
1926		MM*	1 1/2c.	9 of 10	32
1926		MM*		2 of 2	31
1932		FF		2 of 5	26, x = 27.9
? ?		FF* ??*			
V. = 1 + %	1934	MM		3 of 4	21
	1939	MM		4 of 4	26
	1935	MM		6 of 11	31
	1937	MM		7 of 11	33
	1940	MF		2 of 2	28
	1955	MM		2 of 2	27
	1962	MM		1 of 2	22
	1963	FF		2 of 2	19
	1964	FF		2 of 2	23, x = 25.6
	?	FF		1 of 1	?
VI. = 1 + %	1951	FF		2 of 2	25
	1955	FF		1 of 2	22
	1956	FF		2 of 3	19
	1957	FF		2 of 3	20
	1961	FF		3 of 4	27
	1974	MF		1 of 1	20, x = 22.2
	?	MF		1 of 1	?

* At least one twin died when 0 - 9 years old

mothers of twins in Generations III and IV is nearly 34 and 28 years, respectively. Three of the twin sets in these generations experienced neonatal deaths to obscure any estimates of zygosity.

The excessive twinning in the middle generations of the Missouri genealogy resembles

a similar episode of excessive twinning in the 1895-1960 population of Colonsay island, Inner Hebrides, Scotland [4]. Both the Colonsay islanders and the Missouri farmers were isolated groups of relatives possibly prone to familial twinning. In each case moderate inbreeding, larger sibships to older mothers, and access to local doctors combined to enhance twin births. Inbreeding may be a primary factor because highly inbred populations can exhibit excessive twinning, such as the Old Order Amish [1: 89-91] and the Samaritans [2: 65-66].

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