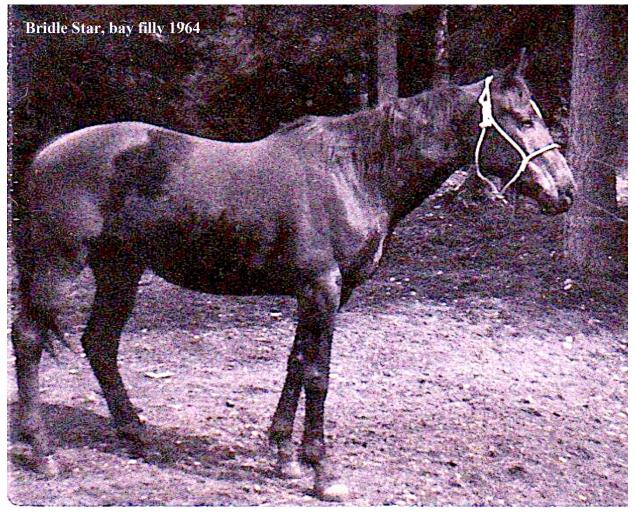


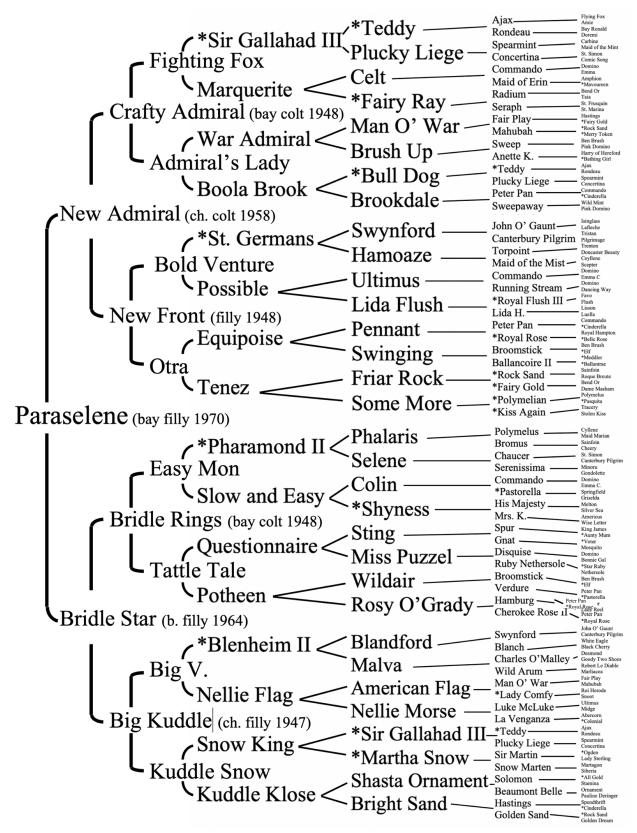
Breeding Analysis of the Thoroughbred Filly, Paraselene

As first-time owners of a thoroughbred mare, Bridle Star, like many people who come into ownership of a pedigreed animal, we believed that it might be a good idea to breed the mare and ultimately to sell or race the offspring. That approach does not often meet with success. We began by going to the Washington Horse Breeder's Offices in Renton, Washington to look up the mare's pedigree and to find out whether there had been any considerable racing success in the first few removes of her ancestors. Those first few removes did not suggest success to the endeavor; the personnel at the office told us we should not attempt it. But we did.

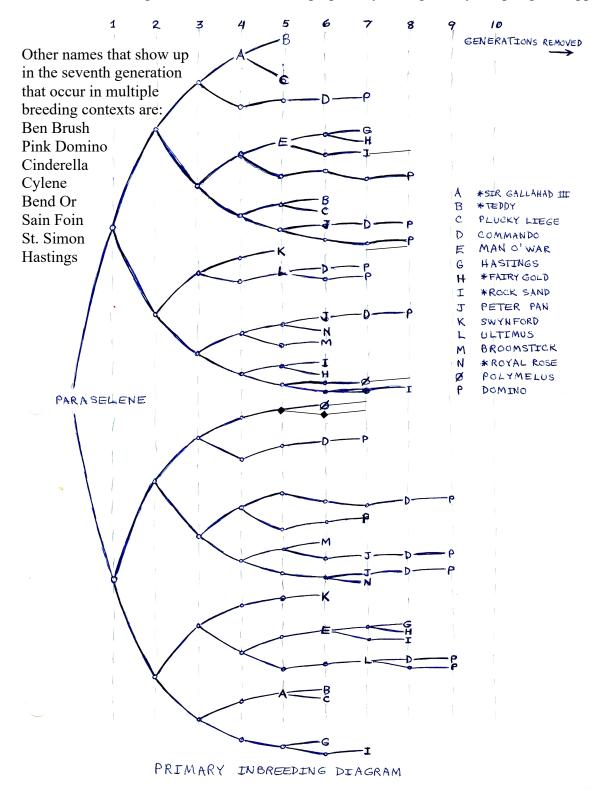


Because of our personal awareness of the owner of a thoroughbred stallion, New Admiral, we opted to have Bridle Star bred to him. And in 1970 we were the 'breeders' of our first foal. The name Paraselene somehow sounded good; there had been an excellent mare by the name of Selene, Para seemed to relate to the 'New" in her sire's name; and we were off to the races so to speak.

It would be disingenuous to imply that we had performed pedigree analyses prior to mate selection, but while we anxiously awaited her arrival and continuing during the anticipation of her racing career, many hours were spent at the Horse Breeders offices tracing her bloodlines through the extensive English and American stud books available there. After many such enjoyable hours we had obtained an eight-generation pedigree.



Even in this quite modest pedigree with no classics winners in the first few removes, it is apparent that as one goes back a few generations, the great horses of the past are prevalent throughout. Some individuals occur multiple times and nicks of a stallion with mares by another stallion come into focus. I was driven to quantify some of these nicks and inbreeding patterns. So I generated an inbreeding diagram of names that occurred more than once and whether always as the ancestor of a single individual or whether prepotency through many offspring was apparent.



You'll notice that I added five instances of where Domino appears in the ninth generation in addition to his appearing seven times in the seventh and eighth generations. Domino and his son Commando were outstanding sires and the significance I had placed on Man O' War diminished somewhat. Each node in the following diagram is a single individual, but some individuals occur along many DNA paths from the past to the living descendant. (The labeled nodes are identified on the previous chart.

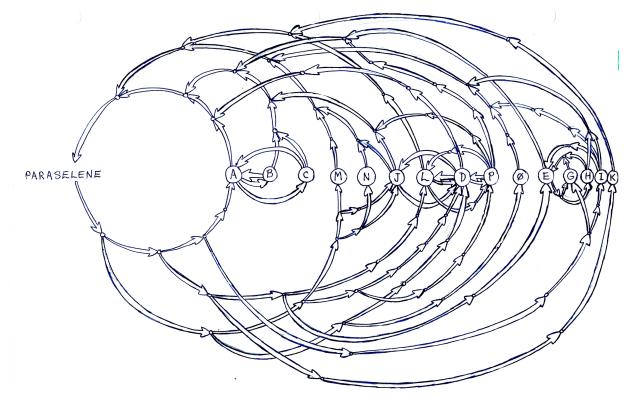


Diagram for computing index of homzygosity

Needless to say I was intrigued. Why stop at eight generations, or nine? Where was Eclipse and the three notable foundation lines in the breed? So I pushed on. The Washington Horse Breeders offices were close by where I worked (relative to how far from our ranch), so I spent many hundreds of hours total (and I must say I pleaded with Kay to do the same). Ultimately, I had extended the pedigree another eight generations -65,535 positions. Each of the right-most list of progenitors in Paraselene's pedigree warranted their own eight generation pedigree, so I did that for each of them – like that shown for Pink Domino below. Although he shows up many times, not all lines go far enough back in time to register how many times Eclipse (chestnut 1764) shows up in the pedigree. Certainly it takes another two or three generations to capture the three most notable foundation sires, the Darley Arabian, the Godolphin Arabian, and the Byerly Turk. Eclipse's great grandson Whalebone (brown 1807) appears over 1,200 times in this pedigree. (Check out the pedigree of Pink Domino below.) This line descends from Eclipse through Potooooooo (yes, Pot eight o's is how it is listed) chestnut 1773, and Waxy (bay 1790), each prepotent in his own right. Attempting a homozygosity diagram like that shown above would be virtually impossible. You will find Lexington about whom the recent novel 'Horse' was written in this pedigree along with Glencoe who was successful in England before being shipped to the United States whose breeding record shows over twice as many fillies as colt offspring and only

his fillies show up as the prodigious mares in every pedigree – most notably through Pocahontas (bay 1837) in England and the grey mare Reel (1838) in the United States.

	and the second	4520	ORLANDO 6, 1841	TOUCH STONE BIBBI	CAMEL	WHALE BONE 1807 (D)
Level Marine	2250	*ECLIPSE 1855		VULTURE 1833	BANTER 1837	MASTER HENRY
	1	1.45.57 1.675	GAZE	BAY MIDDLETON by, 1833	SULTAN COBWEB (0)	BUSTARD SELLAM PHANTEM 1808(1)
AL SALE AND	ALARM	1869	(1)	FLY CATCHER	SODOLPHIN SIS. TO COBWEB	PHANTOM 1808 (D)
1124	的全部行。	* MAUD	STOCKWELLCH, 1849	POCAHONTAS 1832	ECHIDNA 1839 #CLENCOE 1831	ECONOMIST
	12312.11	[#]:(No 9	COUNTESS OF ABERMARLE	LANERCOST	LARPESSA 1830	TRAMP BUSTARD
HIMYAR	1875		Cooperation ABONINGCE	SIS TO HORNSEA	OTTS VELOCIPEDE CERBERUS MARE SIR ARCHY	BLACKLOCK
		LEXINGTON 6,1850	BOSTON ch, 1833	SIS. TO TUCKAHOE	LASALTRAM MARE	*DIOMED LATT (D) *SALTRAM 1780 (D) *DIOMED LATT((D)
11-0		LEA110 1011 0,1850		*SARPEDON	EMILIUS 1820 (D)	ORVILLE
	HIRA	Alto Alton	ALICE CARNERL	ROWENA	SUMPTER	THE FLYER SIR ARCHY ROBIN GREY
	and		#AMBASSADOR du 1839	PLENTPOTENTIARY de 1831	EMILIUS (820(D)	PERICLES
452	States -	HEGIRA		*LEVIATHAN	HORNSEA'S DAM	WAXY 1790 (D) CERBERUS ORVILLE
V DOMINO B1. 1891			LFLIGHT ch 1837	CHARGETTE HAMELTON	SIR CHARLES	WINDLE SIR ARCHY SIR HARRY 1795 (67
	and the second		FAUGH - A-BALLAGH	SIR HERCOLES dy 1826	LADY OF THE LAKE WHALEBONE 180710	WAXY 1790 (D) WANDERER
		# LEAMINGTON B1853	3	GUICCIOLI 1824	ELIGHT	CHANTICLEER ESCAPE *BUZZARD
	ENQUIRER		PANTALOON MARE	PANTALOON DAPHNE	LAUNEL	REACKEACK
			LEXENGTON 6,1850	0-551 1. 1877	MASD OF HONOUR TIMOLEON	CHAMPION 1797 (D) SIR ARCHY BAUL'S FLORIZEL
	A4 11 1	LIDA		ALICE CARNEAL	SIS. TO TUCKAHOE *SARPEDON ROWENA	EMILIUS 1820 (D) SUMPTER *DIOMED CHITTO(D)
Athan	Arra Biol	A	LIZE	AMERICAN ECLIPSE	MILLERS DAMSEL	*DIONED WITTID) *MESSENGER *DIONED WITTID)
1/WANNED	EGRAY C	. 18 10'	a series and a	BOSTON ch. 1833	CALYPSO TIMOLEON	BELLAIR
		WAR DANCE di 1859	LEXINGTON 6.1850	ALICE BARNEAL	TIMOLEON SIS. TO TUCKANOE #SARPEDON	STR ARCHY BALL'S FLORIZEL EMALUS (820(D)
		WALL DAIVEL ON 1859	REEL	*GLENDE 1831	ROWENA SULTAN TRAMPOLINE	SELIM SELIM TRAMP GOLUMPUS
	LIZZIE G			*GALOPADE	CAMILLINA	
			LECOMPTE \$ 1850	BOSTON ch. 1835	TIMOLEON SIS. TO TUCKAHOE *GLENCOE 1831 *GALOPADE	SIR ARCHY BALL'S FLORIZEL SULTAN
225	nder fühlten an. Rechten eine	LECOMPTE MARE	EDITH	*SOVEREZGN	*GALOPADE EMTLIUS 1820(D)	CATTON ORVILLE BOURBON
PDNK DOMINO				HIDDLEH	FANDANGO	SULTAN *LEVIATHAN
			BIRDCATCHER Ch. 1892	SIR HERCULES d. 1826	HALEBONE 1807(D) PERI BOB BOSTY	WAXY 17 90 (D) WANDERER CHANTICLEER
1. 19 · 19 · 19 · 19 · 19 · 19 · 19 · 19		OXFORD ch, 1857	())	PLENIPOTENTIARY Ch. 1824	EMITTUS 1820 (D)	ESCAPE
	STERLING	b. 1868	HONEY DEAR 1844	MYDEAR	HARRIET BAY MIDDLETON 64, 1833	PERICLES
	JIERLEN		FLATCATCHER	TOUCHSTONE BUISI	MISS LETTY CAMEL BANTER 1827 ER.110-DA-PUTA 1812(-)	*PRIAM WHALEBONE (8070) MASTER HENRY HAPHAZARD
	AND AN A	WHISPER 1858		DECOY	ETNESSE HUMPHREYCLINKER	PEROVIAIN ,
DEALLO FOR OTHING		7	SIZENCE 6, 1848	MELBOURNE 6.1834	HORNSEA	COMUS CERVANTER VELOCIPEDE
BEAUDESERTS, 187		THE HAR	SIR HERCULES & 1826	WHALEBONE 1807	SOCACE WAXY 1790 (D) PENELOPE	LONGWAIST POT-8-0'S TRUMPATOR GOHANNA
		LIFE BOAT & 1855	-LA HERCOLESCA, 1820	PERI	THALESTRIS	ALEXANDER
	Constant States		YARD-ARM 1843	SHEET ANCHOR	LOTTERY (L) MORGIANA PAULOWITZ	TRAMP MULEY SIR PAUL
	SEAGUL	1866	(1) (1)	TOUCHSTONE 6,1834	1 01/ AI TV 1017	RUBENS WHALEBONE 1807(1) MASTER HENRY
		1857 WILD CHERRY NR.	SURPLICE 1845 (8)	CRUCIFIX 1837	*PRIAM 102/UD	EMILIUS 1820 CD
		the second s	BRIDGET 1846	ROCKET OCARDINAL PUFF	SIR PETRONEL MARE 1813 "	DETRONIZ WALTON DETRONIZ WAXY 1790 (D)
X * BELLE ROSE			c) (RINGLET 6.1821		
		CD C	STOCKWELL ch. 1849	THE BARON CH, 1842	* GLENCOS 1839	STR HERCOLES & 1826 E CONOMIST SULTAN MULEY
		BLAIR ATHOL 1861	(0,D) b. BLINK BONNY, 1854	MELBOURNE BA. 1834	MARPESSA 1830 HUMPHREY CLINKER CERVANTES MARE 1825	COMUS
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		And the second second	FITZ-ROLAND C	ORLANDO 6, 1841	TOUCHSTONE & 1831 VULTURE (833 EMTLAUS (820 (D)	PLENTADTENTIARY 1834 CAMEL LANGAR ORVILLE 6, 1799
		MISS ROLAND 1864		HESPERUS 6.1849	BAY MIDDLETON 6.1833 (D)	ROWTON CALINE
MONTE	ROSA		MISS BOWZER	MANGOSTEEN AIBUR	EMILIUS 1820 (D) MUSTARD 1824	EMILIUS ISTO (D) ORVILLE L.IN9 1 MERLIN
Tuente	HEDGE ROS		WEATHER BIT 6,18421	SHEET ANCHOR	MORGIANA	MERCIN TRAMP MULEYS 1820(1)
		NEPTUNUS 6,1859	1849	BIRDCATCHER ch. 1833	*PRIAM 1827 (D) ORVILLE MARE SIR HERCULES CH.1826 ECHIDNA 1839	WHALERONE INTO
the state of the		E 1969	ATHENA PALLAS .	MINERVA 1842		ECONOMIST MULEY CERVANTES STRHEROLESCH.1824
		<u>E 1868</u> (L) (L' STOCKWELL du 1849	THE BARON ch. 1842	MULEY MOLOCH CERVANTES MARE BIRDCATCHER CH. 1833 ECHIDNA 1834	STR HEROLESCH. 1826 ECONOMIST
· · · · · · · · · · · · · · · · · · ·		WOODBINE	Br 1851 (L	POCAHONTAS 1837	*GLENCOE 1831	ECONOMIST SULTAN MULEY
	-		HONEYSUCKLE	BESWING & 1832	BANTER 1827 DR. SYNTAX & 1811	MARER HENRY 1807(D)
Aver 2 K / B		* *****		BEESWING 6. 1833 7	TOMBOY'S DAM LEVE	ARDROSSAN D. 1809

The following figure shows all 128 extended pedigrees; the left-hand group are the ones in New Admiral's pedigree; those on the right are in Bridle Star's.



Generating extensive pedigrees is no longer the problem it was fifty years ago. There is a site where you can put in a thoroughbred's name to get a six-generation pedigree and information about them including a photo or painting in many cases: https://sporthorse-data.com/pedigree/pocahontas

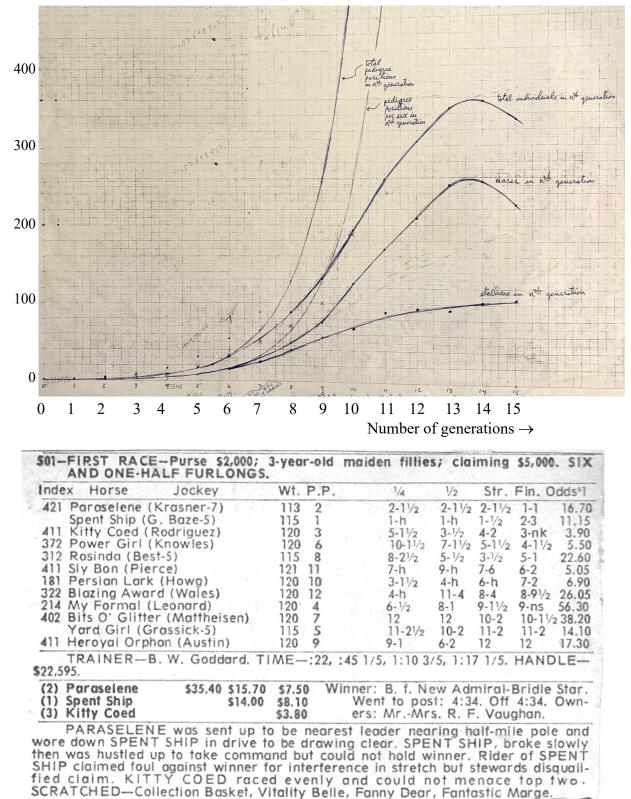
The number of positions in a pedigree and the number of actual ancestors filling those positions differ appreciably due to inbreeding. As we were advised, not every individual thoroughbred should be bred. Unless they are outstanding individuals, there is not much chance of future success in racing their offspring. This breeding strategy is apparent when one analyses a pedigree. In a sixteen-generation pedigree, there are, as noted above, 65,535 positions in the pedigree, but the following figure indicates the reduced number of individuals that occupy those locations.

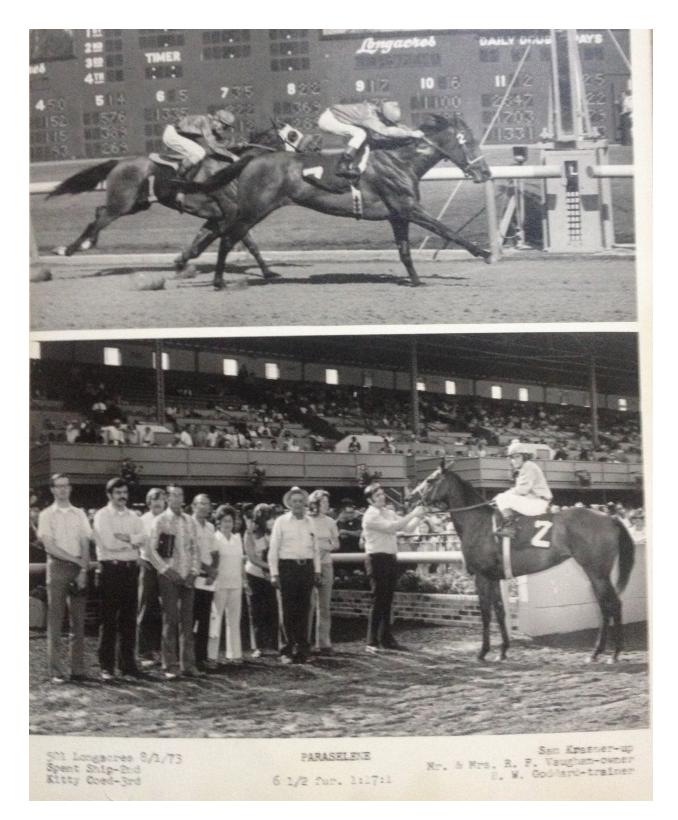
Clearly breeders are much more selective of stallions than of mares. Many unraced or poorly performing mares are bred, but primarily it is only truly outstanding stallions who populate a pedigree. Inbreeding to these prepotent stallions is quite intense in some instances, but in later breeding matches I was primarily interested in inbreeding to great stallions through their most outstanding offspring. One can employ this strategy with more modest means.

Pedigrees are one thing, and whether it was wise or not we raced Paraselene, and she became our very first winner. She had the severe disadvantage of being our first racehorse and some of what Kay would learn in becoming an outstanding trainer she learned from her experience training Paraselene.

The mare Bridle Star, the inadvisability of whose breeding appropriateness had been in question, produced many very useful winners that, by their winnings and being claimed, funded the very powerful stable Kay was able to put together by the late seventies. Every one of Bridle

Star's offspring knew instinctively what was required and did it. Sally Marie won her first start, Tense N' Touchy won in fast time and was claimed, Tertzarima placed in stakes, Reclusive Ascent was an allowance and high claiming filly, Transition Machine, and Jewel Bud were winners.





Bert Goddard was listed as trainer until Kay was granted a license – That was right after Paraselene broke her maiden.

After retirement Paraselene was bred and produced winners.