

PRACTICAL PEDIGREES

A GUIDE TO BETTER PEDIGREE DECISIONS



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The Wisdom of Marg Neal

“The purpose of doing the paperwork is to produce the individual. Once the individual is on the racetrack, it doesn’t matter what the pedigree is. I’ve always talked about breeding for dominance – finding the individual that is the strongest aspect of the mare’s pedigree, then finding the stallion that has that individual in a certain place in his pedigree.”

“We have been conditioned by the restriction of catalogues and advertising to view our horses, at most, as three generation animals. There are a great many people out there today that will tell you there is no reason to look beyond the grandparents of any animal.

I thoroughly disagree. It is, however, a handy position to take for those unwilling to do their homework”

“There is a model of breeding that is like a pattern, and the pattern persists over generations, although, of course, the names change. I like to see a mare that is inbred, and a sire that is not.”

Dean Hoffman Hoofbeats article – September 2001

INTRODUCTION

The horse racing world is full of pedigree theories, beliefs, old wives tales and opinions when it comes to making the most important decisions that breeders or buyers must make – What to breed and what to buy with respect to pedigree. The success or failure of an investment in a race-horse hinges on these crucial decisions and a wrong decision can be at the least very expensive.

One fact that the reader should be aware of is that the pedigree of the horse, once chosen and delivered in the form of a foal, cannot be changed. The breeder can change the environment within which the foal is raised using best practices, the buyer can retain the best trainer available and protect his investment in other ways.

The end result, however, if the pedigree is incorrect, is that best practices in breeding and ownership cannot reverse a bad stallion choice, making that decision the most important one a breeder can make, and the buyer recognize.

A breeder has limited opportunity to make correct stallion decisions for each mare since after several failed matings the damage to the mare and to the breeders reputation is essentially done and the future success of both is compromised.

Success is the result of all of the confident decisions you make. Confidence comes from knowing the facts and being able to sort out fact from fiction.

Another fact that is indisputable is that less than 5% of the foals produced in North America will pay for themselves over their lifetime based on the ability to earn \$100,000 or more. Such a return on investment is clearly inadequate to sustain the interest in both breeding and buying standardbreds. It is little wonder that we see that the number of industry participants is shrinking.

Like any other serious investment your chances of success are greatly improved when you understand the fundamentals of the business and make use of all the tools and information at your disposal to improve your percentages. As Marg Neal correctly pointed out – you need to do your homework.

But what are the things you need to look for in the pedigree, what patterns exist that are worth repeating, and what indeed is the most practical way of making a decision based on pedigree? Is there really such a thing as the right pedigree or shall we say “the correct pedigree”? This booklet “Practical Pedigrees” is designed to give you the answers to these questions and teach the reader how to apply the answers in making correct and profitable breeding and buying decisions based on pedigree.

If as someone once said, that the pedigree is only 18% of what makes a great horse is true, then also consider the fact that it is the first 18% and if it is incorrect the other 82% is a waste of everyone’s time, effort and money. The most important percentage in the purchase or breeding of a top performer is the first 18%, the correct pedigree.

PERFORMANCE AND PEDIGREE

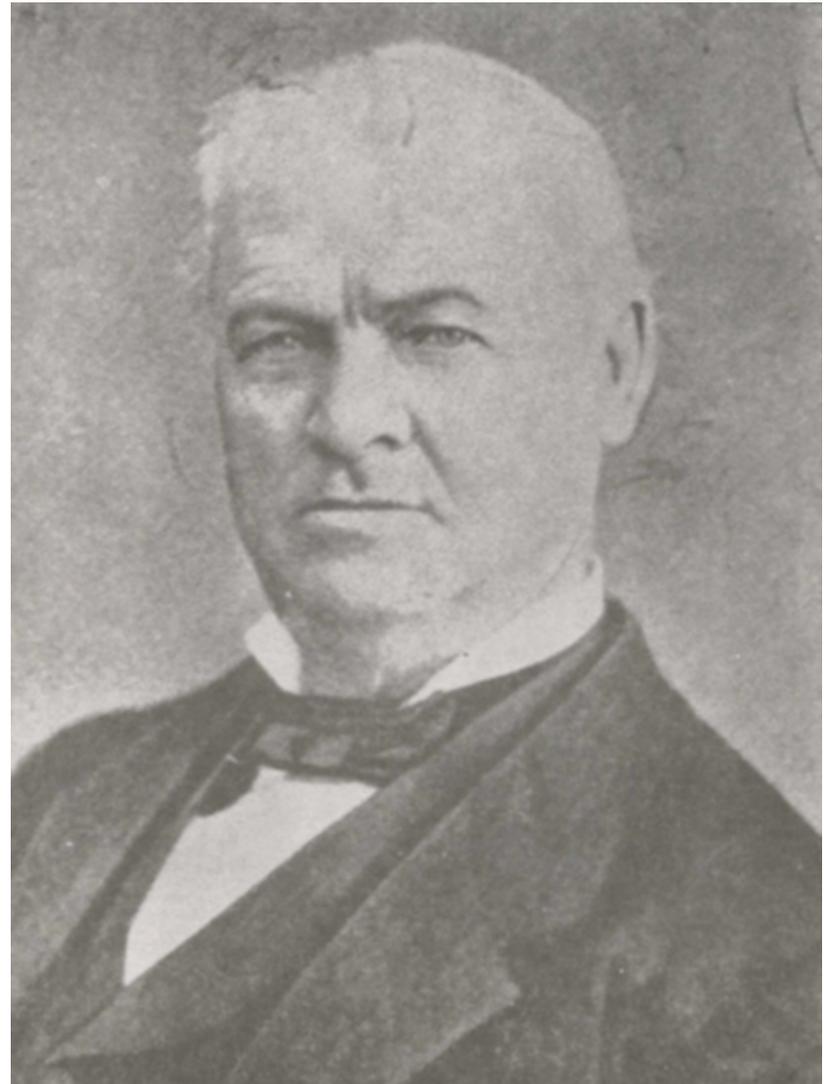
THE STANDARD

I can confirm the wisdom of Marg Neal since it is my own experience that the vast majority of breeders and buyers of Standardbred horses have little knowledge or interest in the “pedigree” beyond the first generation. It is seen to be something to be read, as a page in a catalog, circled, marked and ultimately discarded. More often than not the circles and marks are the result of popular name recognition or association rather than reflecting any understanding of the significance of the individual horses involved. So let us start there and find out who these individuals are and how they fit into the big picture.

The Standardbred is relatively young as a breed and was first documented in Wallace’s *American Trotting Register* published in 1871. John Wallace, who had also been involved in the production of the first North American Registry of the Thoroughbred horse, was the compiler of this first edition which contained the pedigrees and performance information for some 3000 horses that met the “*Standard*” he set for entry into the Trotting Register. The standard he chose was the ability to trot in a time of 2:30 or better at a distance of one mile or to produce an offspring meeting the standard.

There are many breeds of horses as there are of dogs, cats, cattle and the many other purebred animals. Most breeds have standards for admission to their registers based on appearance such as size, colour, body conformation and other physical attributes.

It is not so for the Standardbred. This breed, like it’s cousin the Thoroughbred, is judged by a standard of performance and initially had to meet the performance standard that Wallace established in order to be registered.



*John Wallace established The Trotting Register in 1871-
Source: The American Trotter*

It did not matter to Wallace whether the animal was of Thoroughbred origin or was from one of the many other breeds of the day including the Morgans, Gold Dusts, Copperbottoms, the Canadians, and of course the descendants of the great Messenger and his grandson Hambletonian.

If you go down any shedrow at one of today's tracks you will see a wide variety of so-called "*Standard*" breeds. You will see black, brown, bay, roan, chestnut and even palomino pacers and trotters. You will see tall horses, small horses, long tailed ones and short tailed ones. You will see horses that are fine boned and some that look more like draft horses. They do, however, have one thing in common and that is the ability to trot or pace at speeds that were probably unimaginable in the days of Wallace's initial performance standard.

In the early days of publication of the Registry the pacer was considered a non-standard breed although they were raced in harness just like the trotters. It took several years until Wallace and some of the other breeders were prepared to acknowledge that the ability to pace at speed was indeed worthy of recognition as part of the Standard. Wallace established the standard for pacers at 2:25 in a somewhat futile attempt to limit their inclusion. The popularity of the pacer, however, and the spread of pacing races soon tipped the balance in favour of the pacer and by 1900 the new entries into the Register were pacers in the majority.

The Wallace Registry continued to be published until the mid 1930's when the responsibility was transferred to the newly formed United States Trotting Association. It now appears annually as the USTA Sires and Dams Register.

The origins of the Standardbred are many and varied but today's harness racers, North American breeds at least, all, with very few exceptions, trace their paternal lines to one horse, the famous Hambletonian. Surprisingly Hambletonian, born in 1849, is not known to have competed in a race but entered the

registry as a result of his sire Abdallah having produced some top trotters of the day.

BREEDING TO TYPE

One of the objectives of breeding is to establish the "type" for the breed. Since the Standardbred breed as such is less than 150 years old, and considering the variety of breed types that contributed to the genetic pool, it is small wonder that the Standardbred is far from standard when it comes to type.

In discussing the topic with breeders there is a general appreciation for stallions that will "*stamp their offspring*" and many consider this a valuable attribute. Insofar as it helps in the fixing of the Standardbred type that may be true but what is the ideal type we are striving to produce? This is where the ideas begin to diverge. The problem lies partly in the fact that the Standardbred involves at least two separate physical types, the trotter and the pacer, and what is a good type for one may not suit the different physical or should I say mechanical requirements of the other.

The gait of the trotter requires "*more room below*" as one elderly breeder once told me. By that he meant longer legs and a longer back, presumably to minimize interference in the trotting gait that is the primary cause of breaking stride. Pacers, on the other hand, have a more compact type with an emphasis on strength and speed over mechanics. An even temperament is a major consideration in a trotter but is not as critical in a pacer whose gait is controlled by hobbles. These, however, are general descriptive terms that by no means cover the range of physical characteristics that are considered as part of the breed.

In any discussion of breed type it is important to distinguish between the characteristics you can see, the physical, from those you cannot, the metaphysical. The former are straightforward and include the many aspects of what is called conformation. It is an established practice in breeding to breed away from perceived faults that you can see in an animal such

as large or small size, short legs, long pasterns, and even coat color by going to a sire that offers the opposite in the hope that the problem will be bred out of the offspring or in some cases averaged out...

An important consideration in gaited breeds such as trotters and pacers is of course the ability to trot or pace with a certain degree of ease and efficiency of motion. You might even include disposition or manners, which are attributes that are visually evident although not strictly physical in nature.

The metaphysical side of breeding is not as controllable since it involves both the mental and internal workings of the horse, factors that are perhaps more kindred to the “genotype” rather than the physical type. Genetic variation in an animal such as the horse is much more extreme than in the peas and fleas with which geneticists experiment in the laboratory. Horses also have a much longer generation span or turnover. Breeding out the flaws in the genotype or breeding in the benefits of a superior gene are not overnight propositions that can be achieved as readily as the correction of physical faults which can ultimately be corrected by culling the mare or avoided by refusing to patronize flawed sires.

The desire to compete and win is, to my mind, an inherited trait that is metaphysical in nature. Intelligence and willingness to learn are other metaphysical attributes that can occur sporadically in the offspring of any one sire and dam. As Leland Stanford set out to do when breeding Thoroughbred mares to Electioneer “ *the speed and gameness of the one and the coolness and endurance of the other*” were the metaphysical attributes he hoped to fix in the trotting breed.

The extent to which these are part of the genotype, or indeed part of the environment in which horses are raised or trained, is subject to debate. We know that environmental change can indeed force animals and humans to adapt their type to fit the changing circumstances as part of normal evolution.

In many ways the ultimate breed type for the performance horse has the components of a fast car. You want the best possible structure (conformation) with the least amount of drag or resistance (gait) and then you need the most powerful motor you can put under the hood (heart and lung function). A successful pedigree is one that recognizes the contributions of both the sire and the dam in providing these components.

From the sires (fathers) come many of the physical and conformation attributes of their offspring as demonstrated by the racing prowess of the sires involved. Speed, manners, conformation and gait are essential characteristics in a top sire in today’s world along with a demonstrated ability to win at the top levels of the sport

From the dams (mothers), in addition to complementing the contribution of the sire with respect to conformation, it would appear, based on my own and other research into maternal pedigrees, that there may be a mysterious genetic component we can call “*heart*” that lies dormant until it finds a matching component in the maternal lines of the sire. Finding and using this genetic key can be the difference between success and failure as a breeder or buyer of a top performer and the pedigree is the only road map we have to help us in that search

Before we get into discussing sires, dams and pedigrees in detail it is necessary to understand the terminology that is used in pedigree discussions generally and some additional definitions of phrases and words that are perhaps unique to the practice of “Pedigree Matching”. This is not a new approach to pedigrees but it has had, and still has, a crucial impact on pedigree decisions as we shall see in an examination of the best performers by current top sires. As noted by Marg Neale, the pedigree patterns that have been successful in the past, and have produced the top performers with speed and courage, can and do repeat themselves, patterns that feature the special individuals worth circling and marking on the catalog page.

DEFINITIONS AND TERMINOLOGY

Basic Definitions

Horse – the generic name for any equine animal also used to describe a male horse that is four years or older.

Stallion – A male horse capable of breeding, also referred to as a Stud or Horse

Gelding – A male horse that has been castrated

Filly – A female horse less than four years old

Mare – A female horse four years or older

Colt – A male horse less than four years old

Yearling – A horse that is one year old as defined by its birth year. Depending on the birth month a “yearling” could be older or younger than twelve months.

Aged – A term used to describe any horse over four years old.

Sire – The father of a horse. A horse is “by” its sire

Dam – The mother of a horse. A horse is “from” or “out of” its dam

Broodmare – A female horse that has produced at least one foal.

Broodmare Sire – The sire of a broodmare

Offspring – the sons and/or daughters of a sire or dam, also referred to as foals or progeny.

Pedigree – The collective ancestors of a horse documented in a relational manner

Pedigree Chart – Shows all of the ancestors of a horse over a specified number of generations, typically five or six generations.

Pedigree Tree – A tabulation that shows some or all of the descendants of a horse in chronological order.

Sales Pedigree – A tabulation of the ancestors of a horse showing performance information typically over three generations combined with a pedigree chart, used in sales catalogues. Other non pedigree information is usually included such as the name and location of the seller (consignor) and the stakes races (Engagements) for which the horse is eligible.

Performers – are horses that have a speed record and/or earnings recognized by the breed registry.

Paternal Line – The male line of ancestry through the sire. For Ensign Hanover the paternal line is through Direct Hal. Also referred to as the Sire Line.

Maternal line – The female line of ancestry through the dam. For Miss Pluto Scott the maternal line is through Archie Girl

Maternal family - Is made up of all of the mares on a maternal line together with their foals and the foals of their daughters and is identified by the name of the last recognized and registered standardbred individual to which the female line traces in a pedigree

Tail Female – Also called the taproot or foundation mare and is the last individual along the female line with a recognized pedigree as either standardbred or thoroughbred

Tail Male – Also called the foundation sire and is the last individual along the male or sire line with a recognized pedigree as either standardbred or thoroughbred

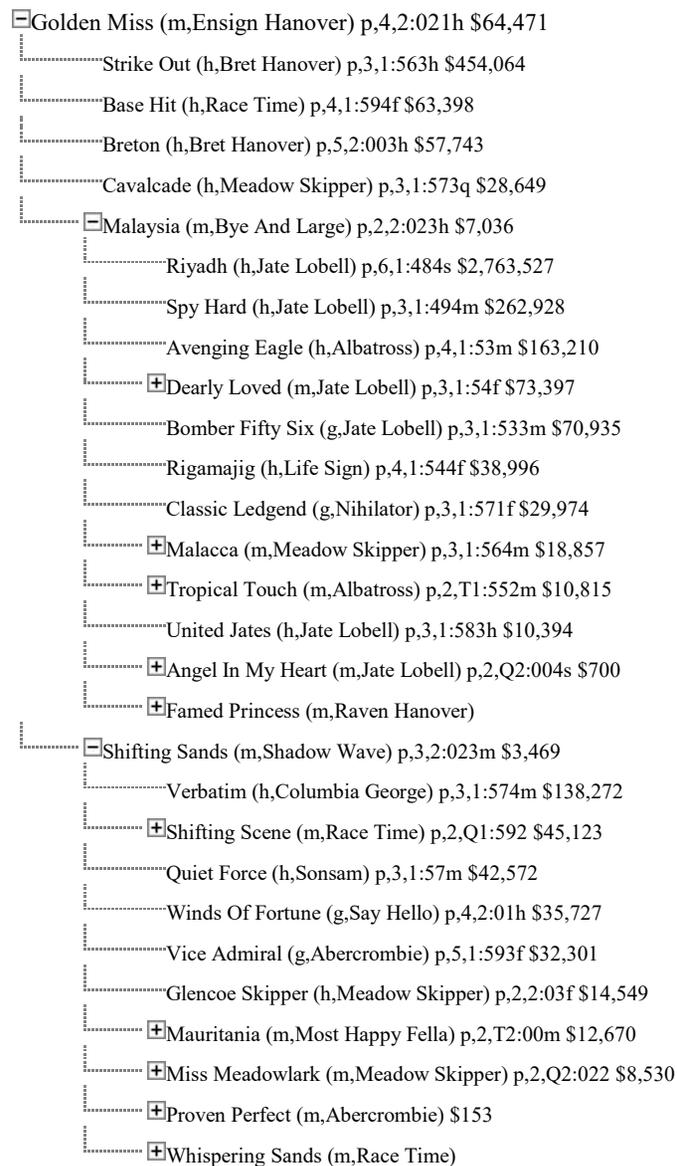
Golden Miss

(1954) p,4,2:021h \$64,471

Ensign Hanover p,4,1:594m \$81,070	Billy Direct p,4,T1:55m \$12,040	Napoleon Direct	Walter Direct	Direct Hal	
				Ella Brown	
				Lady Erectress	Tom Kendle
					Nellie Zarro
		Gay Forbes	Malcolm Forbes	Bingen	
			Gay Girl Chimes	Nancy Hanks	
	Helen Hanover	Dillon Volo	Peter Volo	Berkshire Chimes	
				Miss Gay Girl	
		Miss Bertha Dillon	Peter The Great		
			Nervolo Belle		
		Helen Dillon	Dillon Axworthy	Dillon Axworthy	
			Miss Pierette	Miss Bertha C	
Miss Pluto Scott	Mckinney Scott	Peter Scott	Peter The Great	Axworthy	
				Adioo Dillon	
		Diabla Mckinney	Mckinney	Peter The Great	
			Princess Annabel	Madam Thompson	
	Lu Dene Pluto	Peter Pluto	Peter The Great	Pilot Medium	
				Santos	
		Morganetta	Nelle Worthy L	Axworthy	
			Morgan Axworthy	Miss Anna Jay	
		Lady Wilina		Axworthy	
				Kinglyne	
			The Hobo S		
			Archie Girl		

This is a five generation pedigree of the horse Golden Miss. Her sire is Ensign Hanover by Billy Direct and her dam is Miss Pluto Scott by Mckinney Scott.

Pedigree Tree for Golden Miss



In this example the horses are listed with their sex, sire name, and performance information. Information could also include birth year.

Golden Miss is a mare (m) by Ensign Hanover with a performance record as a pacer (p) taken at 4 years old of 2:02.1 over a half mile track (h) and she earned \$64,471 in her career.

Her sons designated with (h) include Strike Out by Bret Hanover, Base Hit by Race Time, Breton by Bret Hanover and Cavalcade by Meadow Skipper

The daughters (m) of Golden Miss are Malaysia and Shifting Sands. Malaysia in turn is the dam of Riyadh, Spy Hard etc., while Shifting Sands is the dam of Verbatim, Shifting Scene, etc.

Maternal Family Name –The family is named after the earliest ancestor along the maternal line that is recognized as a standardbred in the Registry. Golden Miss is from the maternal family of **Fanny Skinner**.

Maternal Family of Golden Miss

Golden Miss (1954) by Ensign Hanover (1943)
 Miss Pluto Scott (1934) by Mckinney Scott (1919)
 Lu Dene Pluto (1925) by Peter Pluto (1918)
 Morganetta (1919) by Morgan Axworthy (1907)
 Lady Wilina (1909) by The Hobo S (0)
 Archie Girl (1900) by Banner Mark (1888)
 Fanny York (1891) by New York (1867)
Fanny Skinner (1874) by Joe Downing (1858)
 Unknown

Cross – The term given to a relationship within a pedigree between individuals that are present “across” from each other in the pedigree as ancestors of either the sire and the dam.

Line Breeding – Occurs when the sire and the dam have the same paternal (sire) line. e.g. The dam of Golden Miss , Miss Pluto Scott is by Mckinney Scott, a grandson of Peter The Great and her dam is by Peter Pluto, a son of Peter The Great. Miss Pluto Scott is therefore linebred on sire line to Peter The Great.

Outcross – Occurs when the sire and the dam have different paternal lines. Golden Miss is by a sire from the Direct Hal line and her dam is by a sire from the Peter The Great line. She is therefore outcrossed on sire line.

The sire of Miss Pluto Scott is also called the broodmare sire in the pedigree of Golden Miss and Miss Pluto Scott is the 1st dam of Golden Miss, Lu Dene Pluto is the 2nd dam of Golden Miss, Morganetta is the 3rd dam etc.

Sire Lines – Sire lines are named after prominent ancestors of the sire line in question e.g. Meadow Skipper line. In modern pedigrees the sire lines are referred to in terms of the horses that show in a six generation pedigree chart. Current sire lines include the following:

Pacing Sire Lines

Meadow Skipper, most commonly through his sons Albatross and Most Happy Fella

Adios, most commonly through Bret Hanover and Abercrombie

Volomite through Direct Scooter, Bye Bye Byrd or Overtrick

Gene Abbe through Big Towner

Trotting Sire Lines

Speedster through Speedy Scot and Speedy Count

Stars Pride through Super Bowl

Noble Victory through Balanced Image and Garland Lobell

Axworthy through Florican, Sierra Kosmos and Dean Hanover

Paternal Inbreeding – Occurs when the sire and the dam have common ancestors within the first four generations such that the total number of generations is six or less. e.g. Miss Pluto Scott is paternally inbred (linebred) to Peter The Great since he occurs in the 3rd generation of her sire and her dam, the total of the generations being 3+3 = 6. The cross is described as inbred paternally, or on sire line, 3x3 to Peter The Great. Such breedings are considered risky due to the possibility of reinforcing in the offspring any bad traits carried by the sires

Maternal Inbreeding – Occurs when the dam of the sire and the dam have common ancestors within the first four generations. Such breedings can be considered beneficial since the duplication of maternal genetics appears more likely to reinforce in the offspring any positive traits that are carried by the dams. Miss Pluto Scott is inbred maternally to Axworthy as is the second dam Lu Dene Pluto.

Incestuous Breeding – Occurs when the total of the generations is less than 6 and should be avoided when line breeding on sire line although such breedings have been shown to be highly effective in certain types of maternal inbreeding particularly in the production of exceptional fillies or broodmares.

Profile – Is a pattern that recurs in pedigrees and can be used as a predictor of breeding or racing success.

Sire Profile – Every sire has a profile relative to the mares with which he is successful.

Broodmare Sire Profile – Every broodmare sire has a profile relative to the sires with which his daughters are successful.

Sire Preference - The preferred sire line is derived from looking at the sire lines in the dams of the top performers by the sire.

Profile Summary – Is a short statement of the sire preference with respect to type of mares. The full profile summary of the best mares for Western Ideal is as follows: “Non Meadow Skipper line mares except Meadow Skipper line mares that have a second dam through Meadow Skipper or whose second or third dam is by a son of Adios or Good Time”.

The profile can be further shortened into a general profile for tabulation purposes as follows: “Non M.Skip line dams ex d/M.Skip or with Adios or Good T line 2-3”. The key element is the presence and position of Meadow Skipper.

THE PEDIGREE

In its simplest form a pedigree contains a record of the name of the father or sire and the mother or dam together with the name of the horse itself. This basic information is sufficient to record the horse in the register along with the birth date, breeder name and other identifying features such as sex and colour. It does not, however, convey any sense of the importance of the parents involved unless you are familiar with the names. Even then it is not possible to give an opinion on the value of the pedigree based simply on the parentage.

Breeding quality horses capable of performing at the highest levels is much more than breeding the best to the best. If it was that simple then everyone would have a World Champion and those with the money to buy the best would dominate the sport. Thankfully that is not the case and Standardbred history is full of the exploits of horses that were champions but were ignored as yearlings because of their looks or their supposed shortcomings with respect to pedigree.

The pedigree is the foundation of the breed just as the 3000 plus pedigrees that Wallace documented were the foundation of the Standardbred Register. Without a proper foundation nothing lasts. The foundation of a house is probably less than 10% of the total cost but ignoring its importance will inevitably cost you in the long run. So it is with the pedigree of the modern day Standardbred.

Understanding pedigrees means recognizing what it is in the pedigree that is significant. The Standardbred is a performance-based breed and the very best have the ability to go fast and make money. A pedigree with just names therefore is next to useless unless you can see the performance data for other horses in the pedigree or family.

You will hear breeders talk about maternal families. It has been said that money in the family is money in the future and truer words were never spoken. Notice the emphasis on money not

speed, although the Standardbred was originally a creation of speed.

According to Sidney Lerner, one of the foremost experts on Standardbred maternal families, there are 40 taproot families of consequence that produce the vast majority of top performers from the 1,334 families identified. In a study of the top two year olds of 1985 presented by Lerner, in the August 1986 edition of Hoofbeats, the percentage of the best two-year-old pacers from the top 40 families was 83%, confirming a similar study of the previous year where the percentage was 79%.

Group One	Group Two (Cont.)	Group Five
Minnehaha	Abbess	Maggie
Lady W	Nelly by Denmark	Nelly Walton
Jessie Pepper	Nina Neave	Woodbine
Mambrino Beauty	Dairy Maid	Belle H
Midnight	Lady Hurd	Bess
Lizzie Witherspoon	Maggie Gaines	Roberts Mare
Medio	Mary	Dolly Forward
Copeland Mare	May Taylor	Duxie
Miss Duvall	Crazy Jane	Flora
Jane Hunt	Lady Shipley	Kimball Mare
Mamie	Mollie Dillard	Lady Jenkins
Esther	Group Three	Lady Wilkes
Sally Sovereign	Woburn Maid	Lizzie
Group Two	Annie	Maude
Ab	Dora by Dixie	Minnie
Dolly B	Mattie Hunters Dam	Nannie Wiley
Maud by Dr Herr	Miss Sears	Nellie Gray
Aileen	Sally Ann Shuter	Nelly
Belle G	Sue W	Panthea
Molly J	Group Four	Pearl
Almont Belle	Flora Woodburn	Rail Road
Lida	Chicago Maid	Rapidan
Macketta		Topsy Hal
Trusty		

Source: Pedigrees and Performance by Jay Lerner, Hoofbeats, Aug. 1986.

There are many horses that have high speed but make little or no money. Similarly there are many horses that judging by their parents should be world champions but are complete failures on the track and in the breeding shed. An examination of the pedigree will allow you to avoid such horses and focus on the ones with true earnings potential. Pedigrees can be presented in several ways as noted above and indeed can also be interpreted in different ways. Most people who attend harness racing are probably familiar with wagering on the races and the variety of ways there are to handicap the horses and try to pick the winners. Evaluating pedigrees is much the same process. Numbers, statistics and patterns are what you look at and the relative importance you put on these in combination is a very individual thing.

The pedigree page in a typical sales catalog is much like the page in a race program only the time lines are extended back several generations. Instead of racelines you are looking at bloodlines with performance numbers attached which show the speed and earnings of individuals in the family. At the top of the catalog page is the pedigree tree that typically lists the first three generations of the ancestors. Quite often, however, it is important to dig deeper into the family tree to look for pedigree patterns that may exist but for now let us look at what we can see on the page.

This is a basic representation of a sale catalog pedigree. Catalogs vary in form and content and additional information usually provided includes the order of sale or hip number, consignor, sex, birth date, an owners statement and stakes engagements if any. While all of this additional information is needed in making a final purchase decision we must first concentrate on the most important facts presented, how fast and how much money. Due to space limitations it is not always possible to show every individual in the immediate family, in fact most catalog pages are of interest as much for what you don't see as for what is printed on the page. Not all sales companies provide data on the number of previous foals especially the ones that did not race.

SHAKA HANOVER

Western Hanover p,3,1:504m \$2,541,647	No Nukes p,3,T1:521m \$572,430	Oil Burner
	Wendymae Hanover p,4,T1:57m \$8,887	Gidget Lobell
	Artsplace p,4,1:492m \$3,085,083	Albatross
Shades Of Art p,4,1:524s \$200,050	Ombre Rose p,3,1:553m \$250,666	Wendy Sue Hanover
		Abercrombie
		Miss Elvira
		B Gs Bunny
		Penny Royal

First Dam:

SHADES OF ART p,4,1:524s by Artsplace. First foal

Second Dam:

OMBRE ROSE p,3,1:553m by B Gs Bunny. Dam of:

LARGO p,5,1:51m (h, Cam Fella). Winner of 45 races and \$736,910.

AUSTIN p,5,1:502m (g, Artsplace). Winner of 19 races and \$274,553.

SHADES OF ART p,4,1:524s (m, Artsplace). Winner of 9 races and \$200,050.

NICK CHARLES p,4,1:562h (h, Artiscape). Winner of 12 races and \$97,819.

MARK B p,4,1:572h (g, Direct Scooter). Winner of 6 races and \$27,093.

Lola (m, Artsplace). Winner of \$3,390. Dam of:

CANYON WIND p,5,1:484m (h, Cambest) Winner of 21 races and \$659,925.

PARAGON p,4,1:523s (h, Cambest) Winner of 5 races and \$163,341.

LAREDO HALL p,4,1:541m (h, Cambest) Winner of 6 races and \$81,277.

LONE STAR HALL p,3,1:541m (h, Blissfull Hall) Winner of 2 races and \$16,213.

LINCOLN HALL p,3,1:582f (h, Blissfull Hall) Winner of 1 races and \$4,260.

HEY GIRL p,3,Q1:591m (m, Matts Scooter). Winner of \$1,485. Dam of:

ASTRONOMICAL p,3,1:504s (h, Astreos) Winner of 13 races and \$539,166.

At 2, second in Canadian Breeders Final. At 3, winner of OSS Gold elim at Woodbine, Hiawatha and Windsor, Ontario Gold finals at Mohawk and Windsor, divisions of Jug Preview, and Flamboro Breeders

Lady Largo (m, Cam Fella). Dam of:

RED BULLET p,4,1:524f (h, Life Sign) Winner of 14 races and \$93,138.

TWO PUNCH p,3,1:541f (h, Artsplace) Winner of 11 races and \$45,571.

KINGPIN p,4,1:543f (h, Jate Lobell) Winner of 6 races and \$20,536.

Third Dam:

PENNY ROYAL p,3,2:003m by Airliner. Dam of:

SAND KEY p,4,1:512m (g, Arties Dream). Winner of 24 races and \$331,451.

OMBRE ROSE p,3,1:553m (m, B Gs Bunny). Winner of 8 races and \$250,666. As Above.

TULULU p,4,1:513m (m, Niatross). Winner of 15 races and \$154,294. Dam of:

THINKATIVE p,5,1:523s (g, Western Hanover) Winner of 19 races and \$342,076.

INSTANT DELIVERY p,4,1:513m (h, Artsplace) Winner of 19 races and \$122,961.

PENNY PERFECT p,4,1:554m (g, B Gs Bunny). Winner of 17 races and \$127,243.

Vesta Blue Chip (m, On The Road Again). Dam of:

RAINBOW BLUE p,3,1:492s (m, Artiscape) Winner of 30 races and \$1,600,012.

At 3, winner of division of Historic Debutante, NJSS leg at the Meadowlands, elim of Mistletoe Shalee, Glen Garnsey, Tarport Hap div., Fan Hanover elim. and Final, Nadia Lobell, Breeders Crown, Matron elim and Final.

WESTWARD VISION p,4,1:513m (h, Western Hanover) Winner of \$179,738.

Sales pages feature what is called “**BLACK TYPE**” where the horses that have gone fast, made money or won a stake race are shown in bold capital letters.

There is a difference, though, between one black typed individual and another. To be eligible for such prominence a horse has to have a record of 2:00 or better, have made \$100,000 or more lifetime, or has won a minor stake race anywhere in North America. These are modest standards indeed in today’s market and badly in need of revision. Clearly it is very easy to be blinded by the black type at first glance. A closer look can reveal the true value of the horse in question. One way to do this is to assign a value to the pedigree based on a rating scale that takes into consideration the speed and earnings in the family just as some trainers use a similar point scale to rate the individual on conformation.

Before going through such calculations, however, which could take some considerable time for a catalog with several hundred horses, let us look to see if there are other ways in which we can confidently screen the list down to a more manageable number.

We will deal with what is perhaps the most important screening tool, the correct pedigree, in a subsequent chapter but there are other factors that are commonly used to further reduce the number of horses to be physically inspected? Here are some of the most common.

1. Previous production of the dam
2. Racing or breeding jurisdiction
3. Consignor reputation
4. Birth month
5. Colour
6. Patterns of success
7. The Golden Cross
8. The flavour of the day

There are likely other such factors but do any of them have any merit ?

Previous Production of the Dam

In the example pedigree the horse for sale is a first foal. This is a situation that has stirred much debate. If you do a statistical analysis of first foals you will find a surprisingly large percentage turn out to be the best of the mare’s lifetime production. You can verify this by taking any random number of pages of the USTA Sires and Dams book and doing the math. There is indeed a bias in favour of first foals but it is largely influenced by first foal colts – not fillies.

First foals tend to be smaller than average and fillies smaller still, was one veterinarians explanation for this bias against first foal fillies. Factors that seemed to exclude fillies from the risk inherent in their birthright are early foaling dates and mothers that themselves showed early speed. All of this, however, is strictly conjecture based on random impression and in the absence of a study that shows the facts is not the sort of thing on which to shorten the list early. If at the end of your analysis of all factors you have to choose between a first foal filly and one that is from a dam that has already produced something then it may become important to the final decision.

In the case of a mare that has already produced there are a number of things to watch for. Firstly are all the previous foals identified in some way? If they are not on the page you can get this information from other industry sources. It is important to know since there is another bias at work in the breeding industry and that is foal order based on how many foals the mare has already produced. Just as there appears to be a success bias towards early foals in birth order there also appears to be a failure bias towards later foals. Again you can test this out by looking at the production of mares with long breeding records and you will see that after the sixth foal there is a definite drop in success rate in producing significant performers.

Before you start putting lines through the catalog pages of late birth order foals, however, you should be aware that Gallo Blue Chip, the winningest pacer of all time was a 10th foal and there are others such as Grinfromeartoear who was an 11th foal or even Muscles Yankee who was a 7th foal and might have been eliminated on a six foal rule.

As a rule of thumb, rather than a rule based on fact, however, the use of birth order as a screening tool can dramatically reduce the number of horses that you end up looking at. You should look at the exceptions to see why they might have beaten the apparent bias they face. Sometimes it is a case of the mare finally getting bred to the right stallion, or the mare shows a high percentage of successful previous foals. Foal order decisions without caveats are fine provided you are prepared to miss out on the odd great horse.

Racing or breeding jurisdiction

Whether buying yearlings or broodmares there is clearly a need to have an objective in mind with respect to where you want to race or breed. It is important for long term success to have a strategy that allows you to be competitive within your means. There are opportunities in every sale that allow you to do this

In the larger yearling sales you will find horses from several jurisdictions and it is a relatively simple process to eliminate those that don't fit your objectives. The same can be said for the sex and gait of the yearling since there are selective shoppers who are only interested in trotting fillies or pacing colts.

Buying yearlings to compete at the highest level usually means paying premium prices if you rely strictly on the face value of the pedigree page. There are, however, individuals in every sale that fit your objectives and your pocket book that you may miss out on by being too selective on what may be considered non critical factors.

Consignor reputation

This is another judgemental screening tool that can see you missing out on good opportunities. It is clearly an important consideration since consignors are very conscious of their successes and not shy in making them known. The issue, however, goes beyond just having some successful previous consignments. Many of the yearlings are consigned through agents and you never get to know much about the actual breeder or the farm where the yearling was raised. The larger farms can be assumed to be operating with best practise but how about the smaller breeders? To the extent it is possible it is a worthwhile exercise to find out the facts ahead of the sale either through a farm visit or a conversation with someone who has been there.

Birth month

This is another of those controversial issues that pops up in the trade magazines when someone does a random survey and finds another bias that may or may not be significant.

Because of the racing environment in North America, with its emphasis on big purse, early stakes for two year olds, there is a general concern regarding foaling date. It is based on possible maturity issues for foals born late in the season from mid May on. There are many ways to look at the results of various studies that have been done and there are so many factors involved other than the date of birth that no clear rule is possible to identify with confidence. One thing is sure, however, and that is such situations can present bargain opportunities when the right horse comes along with the "wrong" birth date.

Colour

Like foaling date, the colour of the yearling is the stuff of "old wives tales" when it comes to making a purchase. You either like a certain colour or you don't but there is no significant bias

that I am aware of other than the old saw about chestnuts and white feet, that is worthy of comment or consideration. Since both chestnuts and white feet are rapidly being bred out of the gene pool there is little to fear from a color bias and certainly little use for it as a screening tool.

Patterns Of Success

A Pattern of Success can be as simple as the position in the pedigree tree of certain ancestors or as complicated as counting up the number of times the pedigree traces back to some obscure ancestor that you consider important. You will hear horsemen talk about Speedy Crown being 3x4 in a pedigree or Adios 4x5 with the numbers referring to the generation where the individual occurs in a generational pedigree chart. Such patterns often have significance but are by no means failsafe or consistent from sire to sire.

In fact when you get familiar with pedigrees you will find that, just as in handicapping the races, the patterns of success inevitably have exceptions. It is important to remember, however, that success in owning Standardbreds, like all other sports, is a game of percentages and those who play the percentages in their favour will be the ones to succeed.

To play the percentages you have to know them. One key measuring stick to use in assessing pedigrees is the percentage of performers by a sire that earn \$100,000 or more. Typically a successful sire will average 15% or better. Within that statistic, however, are certain matings with a much higher chance of success resulting in what the industry calls a “golden cross”. Close analysis of this golden cross information shows, however, that such statistics can be misleading as we shall see.

A yearling is clearly much more than just a combination of a sire and a broodmare sire and indeed every sire has a profile, or pattern, in relation to the mares with which he has most success.

The Golden Cross

It is a favorite saying of many knowledgeable breeders that “*the best sires of yesterday are the best broodmare sires of today*”. This makes eminently good sense since it is a natural extension of a similar vein in the phrase “*the best race horses make the best sires*”. There are, of course, rare exceptions but again the percentages of breeding favor those who follow these mantras in general but there is a caveat.

The broodmare sire, alone, does not make the mare any more than the sire, alone, can make a top performer. Nor is it wise to assume that the sire needs only a top broodmare sire to work with, as the followers of the “golden cross” would have us believe.

Occasionally you will see top performers by a sire that are so much better than any others by the same sire or that have the same sire – broodmare sire combination. Such is very definitely the case for Gallo Blue Chip.

Gallo Blue Chip earned almost \$4.3 million and is the richest performer from an Albatross mare and this makes Magical Mike, when crossed with Albatross mares, the sire with the highest average earnings per performer at \$90,000 on the USTA golden cross list.

There are, however, 71 horses of racing age, other than Gallo Blue Chip, with the Magical Mike – Albatross cross that collectively have made an average of \$30,000. Indeed of the ones on the list as of this writing only ten have made over \$100,000 for a percentage of 13.2% versus the average for all sires with Albatross mares of 18.9%. Clearly Gallo Blue Chip was a unique individual but what is it in his pedigree that makes him so?

The key lies in the combination of sire lines that make up the full pedigree of Camatross, the dam of Gallo Blue Chip. The sire profile of Magical Mike shows that the presence of

Albatross is indeed a common feature in his top performers but there are other sire lines that combine with Albatross to complete the pattern of success for Magical Mike.

Gallo Blue Chip has a second dam by Bye Bye Byrd and, apart from his five full brothers and sisters, is the only one of the 72 by Magical Mike from Albatross mares that is bred that way. There are three others that have second dams by sons of Bye Bye Byrd but they did nothing special. Gallo Blue Chip had a unique pedigree that fitted into the general profile of success of his sire but at the same time his dam was one of a kind among the Albatross mares bred to Magical Mike.

Another classic example of a perceived “*golden cross*” that was only golden in the right circumstances was that of Abercrombie to Albatross mares. Abercrombie’s best performers include Artsplace, Life Sign, Albert Albert, and Crouch, all from Albatross mares. But if you went to Abercrombie on the basis of this apparent success with just any Albatross mare or bought a yearling simply on the “golden cross” you would likely be very disappointed with the outcome unless of course the second dam of your Albatross mare is by Knight Dream or Duane Hanover, which is the pattern for Abercrombie’s top four from Albatross mares.

By now we are getting a sense of how important the broodmare as a total package is and how the sire is only part, although an important part, of any one mare. The Standardbred of today is truly a “*sum*” of its parts and not just “*some*” of its parts.

A yearling or broodmare is much more than just a combination of a sire and a broodmare sire and indeed, as has already been noted, and cannot be over emphasized, every sire has a profile in relation to the mares with which he has most success.

Flavour Of The Day

Who is the hot sire this year? It is amazing how fickle yearling buyers are in their pursuit of a champion and indeed how naïve

they are in thinking that because a certain sire has had one very good, perhaps outstanding, performer that his offspring this year at the sales will be the ones to buy.

Buying anything based on such a rationale is both expensive and very often futile as we shall see. Buying a yearling or breeding a mare based on the attractiveness of a sire alone is not enough. If all there was to buying a yearling was selecting a fashionable sire then why do we need a full catalog page listing the pedigree and accomplishments of the family?

Screening factors such as the ones discussed have one obvious flaw and that is the possibility that there is another Gallo Blue Chip among the yearlings that have been rejected by their use before checking out the one thing that really matters – the correctness or otherwise of the pedigree. Many of the factors used by buyers to justify their purchases have no real rationale founded in fact and are merely impressions drawn from a cursory look at the information listed on the catalog page.

Like any other serious investment your chances of success are greatly improved when you understand the fundamentals of the business and make use of all the tools and information at your disposal to make the confident decisions needed to improve your percentages.

The most important percentage in my mind, however, is the first 18%, the right pedigree.

The only factor that can be used with confidence is the correctness of the pedigree – does it fit the stallion’s profile - the proven or predicted pattern of success?

It is a relatively easy process to find out once you have learned how to do your homework. In today’s world of computers, high-speed communications and the Internet, we have a wealth of information upon which to make better, smarter, more confident decisions. Homework has never been easier and failing to do yours guarantees failed decisions.

SIRE LINES

Before we get into the subject of the correct pedigree we need to look at the sire lines that make up a Standardbred pedigree for it is the combinations of these sire lines and the patterns that result that have a large impact on the success or otherwise of any breeding decision

The sire lines in North America are dominated by the descendents of Hambletonian. While there have been, over the years, many sire lines develop from the earliest progenitors of the sport these have evolved into but four of latter day importance in North America. The principle sire lines are The Abbe whose descendents through grandsons Gene Abbe and Hal Dale include Big Towner, Meadow Skipper, and Adios and their legacy of fine sires; Peter The Great primarily through Peter Scott and Peter Volo who are responsible for the Speedster, Volomite and Stars Pride lines; Axworthy commonly through Guy Axworthy and his lesser known compatriot Dillon Axworthy, and Direct as typified by Tar Heel.

There are other minor sire lines such as Grattan, San Francisco and Single G, like Axworthy descended from George Wilkes, which have almost disappeared from modern pedigrees but frequently show up in older ones.

The four main sire lines have all descended from a horse called Hambletonian, a great grandson of the imported English Thoroughbred Messenger. While Hambletonian was not the only trotting sire of his day in the mid 1800's he was by far the most dominant. He is responsible for four sons, George Wilkes, Electioneer, Happy Medium and Dictator who in turn have produced the four principal lines of modern day breeding in North America. A fifth son of Hambletonian, Strathmore, has extended his line to Australia/New Zealand where he is the foundation sire for the Charles Derby line. His influence in North America has been significant, however, since he is the great grandsire of Adios Guy, sire of the dam of Adios.

Hambletonian by Abdallah

George Wilkes
William L
Axtell
Axworthy
Electioneer
Chimes
The Abbe
Happy Medium
Pilot Medium
Peter The Great
Dictator
Direct
Strathmore
Steinway
Charles Derby

THE ABBE is a grandson of Electioneer, and he has established through two of his sons, Bert Abbe and Abbedale, a dominant place in pacing pedigrees. An interesting fact about Abbedale is that his son Hal Dale, sire of the great Adios, is from a mare that traces to Tom Hal, a line of Canadian pacing breeds that is also responsible for the likes of Star Pointer, the first sub 2.00 pacer. The Hal line died out in North America in the battle with the sons of Hambletonian but contributed greatly to the maternal lines of both the Abbe and Direct pacing lines. The Hal line still exists down under with the descendents of the exported Logan Pointer, a son of Star Pointer, prominent in New Zealand breeding.

The Bert Abbe line has been slow to evolve but appears poised to expand dramatically with the influence of Big Towner and his sons currently at stud.

The line through Abbedale on the other hand has grown quickly into a number of significant siring lines. Grandsons Dale Frost and Adios, both sons of Hal Dale, are responsible for the feats of super sires such as Meadow Skipper, Albatross and Most Happy Fella on the one hand and Bret Hanover and Abercrombie on the other hand. Good Time, another son of Hal Dale has failed to establish a sire line but is responsible for top broodmare sires in Race Time and Best of All.

The Abbe by Chimes

Bert Abbe
 Gene Abbe
 Big Towner
 Abbedale
 Hal Dale
 Good Time
 Race Time
 Dale Frost
 Meadow Skipper
 Albatross
 Niatross
 Nihilator
 Most Happy Fella
 Cam Fella
 Camluck
 Cams Card Shark
 Bettors Delight
 Oil Burner
 No Nukes
 Western Hanover
 Western Ideal
 American Ideal
 Jate Lobell
 Tyler B
 Dragons Lair
 Dragon Again
 French Chef
 Beach Towel
 Jennas Beach Boy
 Adios
 Bret Hanover
 Warm Breeze
 Falcon Seelster
 Mcardle
 Abercrombie
 Artsplace
 Artiscap
 Life Sign
 Real Desire

Peter The Great by Pilot Medium

Peter Scott
 Scotland
 Spencer Scott
 Rodney
 Speedster
 Speedy Scot
 Speedy Crown
 Speedy Somolli
 Baltic Speed
 Valley Victory
 Victory Dream
 Self Possessed
 Cantab Hall
 Father Patrick
 Muscles Yankee
 Muscle Mass
 Muscle Hill
 Arnie Almahurst
 Arndon
 Pine Chip
 Dream Vacation
 Trixton
 Peter Volo
 Volomite
 Worthy Boy
 Stars Pride
 Super Bowl
 American Winner
 Credit Winner
 Victory Song
 Crazyed
 Noble Victory
 ABC Freight
 Garland Lobell
 Angus Hall
 Andover Hall
 Donato Hanover
 Conway Hall
 Windsongs Legacy
 Chapter Seven
 Noble Gesture
 Walner
 Balanced Image
 Mystic Park
 Mack Lobell
 Sampson Hanover
 Sampson Direct
 Direct Scooter
 Matts Scooter
 Mach Three
 Somebeachsomewhere
 Captaintreacherous

PETER THE GREAT, the major trotting sire line of today, but also responsible for a continuing sire line of pacers, is a great grand son of Hambletonian through Happy Medium and Pilot Medium. On the trotting side Peter The Great has seen his bloodlines split into three dominant strains

The Peter Scott line has progressed to a modern day lineup that includes such standout sires as Speedy Crown, Arndon and Valley Victory, each currently with their own sire branches.

These sires have prospered as a result of being bred to mares from the Peter Volo line, which has been split into two significant branches through Worthy Boy and Victory Song, both sons of Volomite. Worthy Boy is enjoying fame through his grandson Super Bowl and his sons as well as through two other grandsons in Nevele Pride and Hickory Pride, while Victory Song's legacy appears to rest with the sons of Balanced Image, Garland Lobell and the exported Mack Lobell. That line seems assured with the success of the Conway Hall grandson Chapter Seven, sire of World Champion two year old Walner and several other young sires beginning their stallion careers.

It is interesting that at the same juncture of the split of the Peter Volo into two separate trotting lines we have the emergence of the Peter The Great legacy of pacing sires, also sons of Volomite. Noteworthy pacing sires of the Peter Volo branch, which is the Peter The Great line most common in pacing pedigrees, descend from the Volomite sons Kings Counsel, Poplar Byrd and Sampson Hanover who are responsible for the likes of Overtrick, Bye Bye Byrd and Direct Scooter respectively. Peter Scott had a pacing legacy also but it ended with his great grandson Overcall, half brother to Overtrick. The Peter Volo line continues for the time being through Direct Scooter and his World Champion son Matts Scooter, his world champion son Somebeachsomewhere and now a grandson in Captaintreacherous who commands a top stud fee of \$30,000.

DIRECT is a feature in many of our top pacing broodmare sires primarily due to the influence of Billy Direct and his son

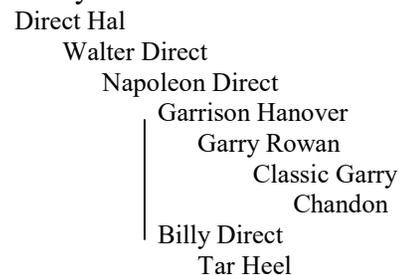
Tar Heel. Bret Hanover and Bye Bye Byrd show Billy Direct through their dams, as do Albatross and Meadow Skipper in their second dams.

Direct is a grandson of Hambletonian through Dictator and descends through Direct Hal, Walter Direct, Napoleon Direct and Billy Direct to the once mighty Tar Heel.

He was a small horse with a compact and bulky body that belied the speed he passed to his sons on the racetrack. Hervey was struck by his seeming lack of the physical traits then looked for in the Standardbred. *“ Altogether he was a strangely fascinating horse to study and to pick to pieces, totally unlike anything ever before seen upon the Grand Circuit – but so potent as a progenitor that he founded a family structurally built upon his own model, the carrying power of the blood being such that in his great great grandson, Billy Direct 1:55, we find it reproduced in its essential characteristics.”*

Billy Direct is best known as the sire of Tar Heel and while there are still some sons of Tar Heel with active sire lines their chances of producing on seem slight. There is, however, a continuing line of Direct through Garrison Hanover in New Zealand and Australia that is represented by Classic Gary and one of his best sons Chandon at stud in Australia.

Direct by Director



The sire legacy of Direct

AXWORTHY was once a dominant part of trotting pedigrees when it was fashionable to cross the immediate bloodlines of Axworthy with those of Peter The Great.

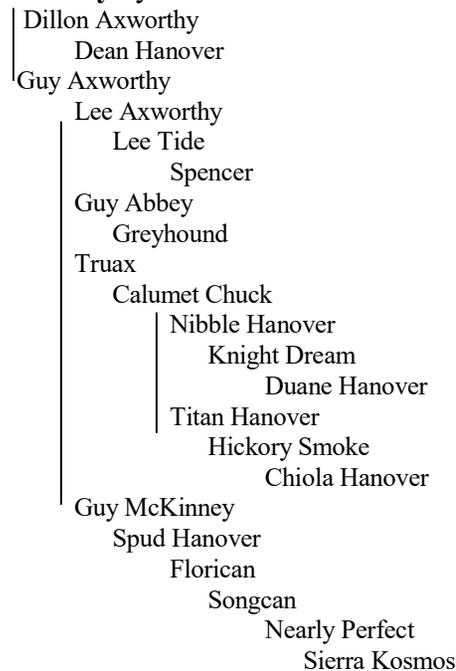
Axworthy traces to yet another son of Hambletonian in George Wilkes whose sons have been responsible for some of the greatest stars of racing in the early part of the century with the likes of Dan Patch and Single G, neither of whom produced on. The legacy of Axworthy as a sire line belongs, however, to two sons of Guy Axworthy, namely Truax and Guy McKinney, who have made different, and at least for now, continuing impacts on the Standardbred breed. A third son of Guy Axworthy, although unable to establish a continuing sire line, was Guy Abbey, the sire of the legendary Greyhound as well as the sire of Scamp, the maternal grand sire of the great Niatross.

Truax evolved into a progenitor of pacing sires with the likes of Knight Dream and his latter day representatives in Duane Hanover, Tropic Song and Romano Hanover. Truax, who was ultimately exported to Europe, is also responsible for the legacy of Hickory Smoke whose propensity for throwing pacers as well as trotters made him an uncertain commodity although his best sons proved to be the trotters Chiola Hanover, with an active sire line in New Zealand, and Dayan.

Guy McKinney is the other son of Guy Axworthy to make an impact on modern day pedigrees primarily due to the emergence of the trotting sires Nearly Perfect and the exported Flower Child.

Axworthy still is a force in trotting sire lines with the likes of Nearly Perfect and his son Sierra Kosmos but the future of the Axworthy line in North America is clearly in doubt. Not so in Europe where Scandinavia and France still have active sire lines tracing to Axworthy.

Axworthy by Axtell



FRENCH SIRE LINES

There were originally five sire lines that traced back their origins to the early 1800's in France. While these sire lines were essentially the creation of English Thoroughbred and Norfolk Trotter stock they are considered to be pure French just as in North America the sires tracing to Hambletonian and ultimately to the English Thoroughbred Messenger, are considered native to North America.

The English Thoroughbred Young Rattler, whose pedigree is unknown, was responsible for three of these lines through Conquerant, Normand and a grandson of Conquerant called Fuschia. Another Thoroughbred sire The Heir Of Linne, who traces back to Bartlets Childers, established what is commonly called the Phaeton line and the fifth line came from Lavater, a son of the Norfolk Trotter Crocus, whose antecedent was Driver and therefore from the line of Flying Childers.

Today there are just two of these lines with active sires that may extend the lines and one of those, Phaeton, is barely holding on. The descendents of the original French sire lines, in fact, are represented by only about one third of the sires currently active in France. The rest are the legacy of Peter The Great (254) and The Great McKinney (18).

The line of Fuschia is split into two separate lines through Bemecourt and Narquois but it is the former that seems to be the most likely to continue on especially through Kerjacques whose sons and grandsons have 79, or over half, of the Fuschia line sires currently standing at stud in France. Fuschia is often called the Hambletonian of France. His sire is of Thoroughbred descent and his dam is Norfolk Trotter just like Hambletonian.

Up until 1970 there were no sire lines in France that featured Stars Pride. The breeding of the great mare Roquepine to Stars Pride to produce Florestan changed that situation and also the complexion of the French trotting breed. In the three decades since, Stars Pride has gone from having no representatives to having 118 active sires currently standing in France. The most recent hero in French Trotting is Jag de Bellouet whose sire, Vikings Way, is a descendent of Stars Pride and whose dam traces to the Peter Scott sire Sam Williams.

Speedy Crown has not had as long to exert his influence but already there are 52 from that line to add to the 69 that have descended from Sam Williams, the other representative of the Peter Scott line in France.

There is no question about the popularity of North American bloodlines despite the attempts of the French studbook to control their access. Indeed of the fifty sires commanding the highest stud fees in France for 2002, only two were stallions from the original French sire lines

France has an active sire line to The Great McKinney, like Axworthy, a fourth generation remove from George Wilkes, that continues to produce both sires and some of the best broodmare

sires in that country. He is noteworthy as the sire of two very prominent broodmare sires in Ogaden and Kairos, sons of the great Uranie and their daughters are found in many of the top maternal families in that country..

Calumet Delco, a grandson of Peter The Great, and a half brother to the dam of Stars Pride, has had a predictably positive effect on French maternal bloodlines although for years there has been a controversy over the extent of his legacy since another sire Gael, a French bred standing on the same farm, was “mistakenly” given the credit for many of his foals.

Another North American export with a continuing influence in French and Italian breeding is Sam Williams, a son of Peter Scott, whose most prominent credit is as the sire line of the great French champion and super sire Ideal Du Gazeau. Quick Song, a grandson of Volomite was exported to the European continent in the 1930's and is responsible for the line of Italian superstar Sharif di Iesolo whose sons Cappriccio and And Arifant are prominent sires of modern day French performers.

Quick Pay, a son of Stars Pride, is the sire of the fastest trotter in the world, a Swedish bred stallion called Victory Tilly, winner of the Nat Ray in record time over the best aged trotters in the United States. Then of course we have Waikiki Beach extending the Speedy Crown sire line in Italy through the previous World record holder in Varenne.

French sires have had limited success and influence on North American breeding but the introduction of sires combining French bloodlines with those of North America, particularly those with dams that are of North American origin, may alter this situation. Breeders in North America welcomed such an opportunity in the form of Revenue, a Swedish bred horse that combined French and North American bloodlines and was a fast and successful race horse in the aged trotting ranks in Europe. He had limited success but did produce five million dollar winners although overall his success rate was a lowly 7.4%. He has now returned to Sweden.

MATERNAL LINES

While it is true that all current standardbreds in North America trace on sire line to one individual, namely Hambletonian, the same cannot be said for the maternal side of the pedigree. We touched briefly on the importance of maternal families and the fact that a small number of these families accounted for a large percentage of the top performers to date. This is not a coincidence by any means and an examination of the top families reveals that there is definitely a common influence at play.

The common element is the Thoroughbred sire Diomed or more precisely his daughters and their maternal legacy.

The story of Diomed is one of the most extraordinary of any racehorse in the world. He was born in Newmarket, England, and it was there that he made his greatest impression as a racehorse when he captured the first running of the English Derby to cap off an unbeaten three-year-old season.

That year, however, was to be the acme of his career in England. He struggled on the track for the next three years before being retired to stud. He quickly lost whatever was left of his racing reputation and gained another one as a failure as a stallion and by 1798 his usefulness as a stallion was apparently at an end. A Virginian named John Hoomes bought Diomed for 50 guineas. On the arrival of Diomed in Virginia, his new owner promptly sold him for almost twenty times his earlier purchase price.

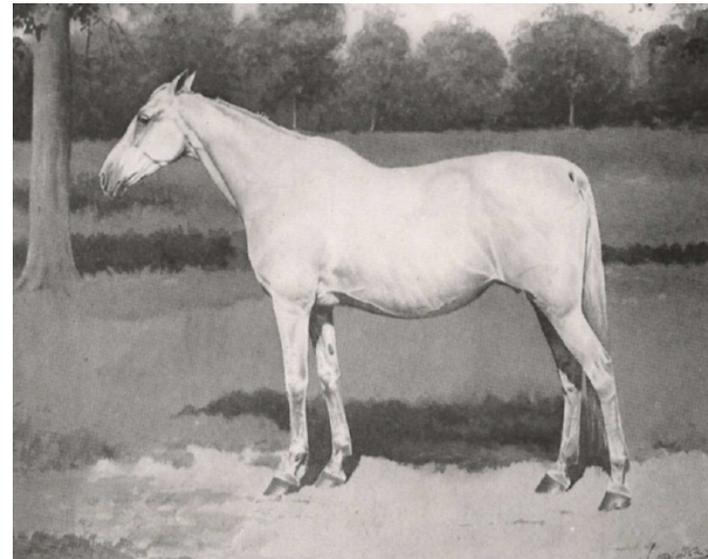
Spillett notes “ *Diomed, superannuated in England and dismissed as worse than ineffectual, could hardly have entered the Virginian stud in less auspicious circumstances. He quickly gave the lie to his critics.*”

At the age of twenty-nine, his last year at stud, he was still perfectly fertile and served a book of mares for a fee of fifty dollars. He died in 1808 at the age of thirty-one. Standing for

only eight years he left a great legacy. By 1843 the best records of mile heats for American Thoroughbreds, up to that time, had been taken by direct descendents of Diomed. Out of the 90 best records at all distances the holders of 61 of them traced directly to Diomed while the dams of 13 of the others were descendents of his

It turns out that the words of the old English saying “one man’s muck is another man’s money” ring very true regarding this event. Diomed became a great sire whose daughters were prized as broodmares.

At the same time as Diomed arrived on the scene so too did the migration of the Canadian horse begin and it was R A Alexander, master of Woodburn Farm who, in reuniting these long separated bloodlines, paved the way for the development of the Standardbred and in particular its maternal identity.



Miss Russell – Queen Among Queens. Source : The American trotter

“Miss Russell was more strongly inbred to the Diomed strain than any trotting mare of her day. She inherited one strain through the dam of her sire Pilot Jr and her dam, Sally Russell,

Diomed was the first winner of the English Derby in 1780. He was not a successful sire in England, but he became one of the principal founders of the American Thoroughbred and a major force in the maternal identity of both Thoroughbred and Standardbred breeds. Source: *The Thoroughbred*



was more intensely inbred to imported Diomed than any other animal whose name appears in the American Stud Book. “ In another reference Mangum writes “ The noted trotters that have been most strongly impregnated with the Diomed strain have been the descendents of Miss Russell, Midnight, Mambrino Patchen and American Star. The finest in quality of the sons of Hambletonian were those out of American Star mares.”

William Preston Mangum in his book on Woodburn Farm entitled *Kingdom For The Horse* continues: *“The Messenger influence through Hambletonian gave the trotting conformation and the inclination to adopt and stick to that gait, while the inheritance from Diomed gave great speed ability and other racing qualities. There are a few Thoroughbred strains that seem to blend harmoniously with the trotting strains. The Diomed strain has proved to be the best of these.”*

The American Horse Breeder was a popular newspaper at the turn of the 20th century and on September 28th, 1898 there appeared a feature editorial and a front-page illustration of Miss Russell. It is important to understand fully the context of this great trotting broodmare and therefore I repeat the introductory part of the article in full along with a follow up in the same journal on July 27, 1910 titled

“The Famous Brood Mare Miss Russell”

“A letter received after going to press last week from Lucas Brodhead, manager of Woodburn Farm, Spring Station, Kentucky, announced that Miss Russell died Sept 19, of old age. Miss Russell at the time of her death was the oldest and one of the best known to horsemen of all the great trotting mares. She was a Queen among Queens, not only in breeding, but also in her conformation and speed perpetuation ability. This is the legacy of the Queen among Queens.

In her long and illustrious career as a broodmare at Woodburn Farms, Miss Russell produced seventeen foals that have

extended her influence worldwide. From North America to the Antipodes and throughout Europe the sons and daughters of Miss Russell have left their mark on the maternal side of the breeding equation.

Miss Russell

Pistachio h p.2:21 3/4 by Belmont
 CPR h. by Belmont
 Lord Russell h. Harold
 Mambrino Russell h. by Woodford Mambrino
 Nutwood h. 2:18 3/4 by Belmont
 Rustique h. 2:18 3/4
 Slavonic h. 2:09 3/4 by King Wilkes
 Cora Belmont m. 2:24 3/4 by Belmont
 Lady Norwood m. by Belmont
 Lady Russell m. by Harold
 Expedition h. by Electioneer
 Maude S m. 2:08 3/4 by Harold
 Nutbourne m. 2:26 3/4 by Belmont
 Nutula m. 2:30 by Belmont
 Velocidad h. by Electioneer
 Rusina m. by Belmont
 Russula m. by Kremlin
 Birri m. by Bingara
 Kalavia m. by Kavalli
 Tuler m. by San Francisco
 Ode m. by In Tune
 Assur h. by The Great Midwest
 Russella m. by Harold
 Russell McCreary m. by Clay King
 Katherine Harris m. by Border Knight
 Prevoyante m. by Farceur X
 Jasante m. by St Estephe
 Lyon h. by Go
 Mary Tudor m. by Worthier
 Emma Smith m. by Morgan Axworthy
 Phellis Arion m. by Arion Guy
 May Castle m. by Guy Castleton
 Justitsraaden h. by Sir Peter Britton
 Belle Smith m. by Bunter
 Syndicator h. by Spencer Scott
 Lee Worthy h. by Lee Axworthy
 Russia m. by Harold
 Abbey Bells h. by Bow Bells
 Suffrage m. by Electioneer

She had eight foals in the 2:30 list including two better than 2:10. This was in a time when a broodmare was considered special if she had more than one standard performer.

Genetic variation being what it is, the foals of Miss Russell were by no means all successful in their breeding careers. Her sons at stud included Nutwood, Pistachio, Mambrino Russell and Lord Russell but the most important was Nutwood, her firstborn son foaled in 1870.

The daughters of Miss Russell have spread their legacy throughout the world as Rusina is responsible for the maternal line of German foundation sire Assur, Russella has Lyon in Sweden, and Justitsraaden in Germany as well as Syndicator and Lee Worthy in North America while Russia is the dam of Abbey Bells exported to Australia.

It is, however, through Nutwood's daughters that the legacy of Miss Russell has primarily been passed on.

Mamie Comet is the granddam of Bonilene, founder of one of the top maternal families in New Zealand.

Lida W is the dam of Nutwood Wilkes, the sire of Oniska, and of Direct Line, sire of the dam of Oniska so the dam of San Francisco is inbred 2x3 to Lida W thus doubling up the legacy of Miss Russell and passing it via San Francisco through Cita Frisco to Volomite, sire of the dams of such broodmare sires as Tar Heel and Good Time. Another daughter of San Francisco is Dillcisco, dam of Stars Pride.

By By is the dam of Adioo and granddam of Adioo Guy, sire of the dam of Adios. She is also the great granddam of Dillon Axworthy through Adioo. Helen Hanover, a major influence in modern pacing pedigrees is inbred 3x2 to Dillon Axworthy. Other Adioo sires include Wilmington who combines with Dillon Axworthy in the maternal lines of Abercrombie.

Stray Moments is the maternal source of over sixty sires including Cam Fella, Northern Luck, and Goliath Bayama,

Manette is the dam of World Champion Arion, and Margaret Parrish, whose presence in top trotters today is overwhelming, and who is inbred 3x2 to Arion maternally.

Nemea is the maternal line of Swedish sires Peter Rutherford, Bulford and Chilton.

Galena is the granddam of Electioneer, the founder of the Abbe line of pacing sires.

Lady Marjoe is the great granddam of Jack Potts, one of the premier broodmare sires in the evolution of both trotting and pacing in Australia and New Zealand.

Hazel Nutwood is the maternal line of such sires as Dexter Nukes, Sportsmaster, Adios Butler and Governor Skipper.

Miss Nutonia is responsible for Martinos, sire of the dam of Gene Abbe.

There are many other traces to Miss Russell through other offspring of Nutwood and through her other sons and daughters that show up in modern pedigrees but appear only as minor players in the overall scheme of things. The key players are those that show close inbreeding maternally and they are the ones that bear watching.

Concentrations of the maternal influence of Miss Russell show up in today's top pedigrees through superior females far too often to be ignored. In addition to her sons and daughters, there are several descendents that through inbreeding have fortified the legacy of Miss Russell to provide themselves not only with outstanding racing careers but also to establish them as turning points in the evolution of the top performers of today.

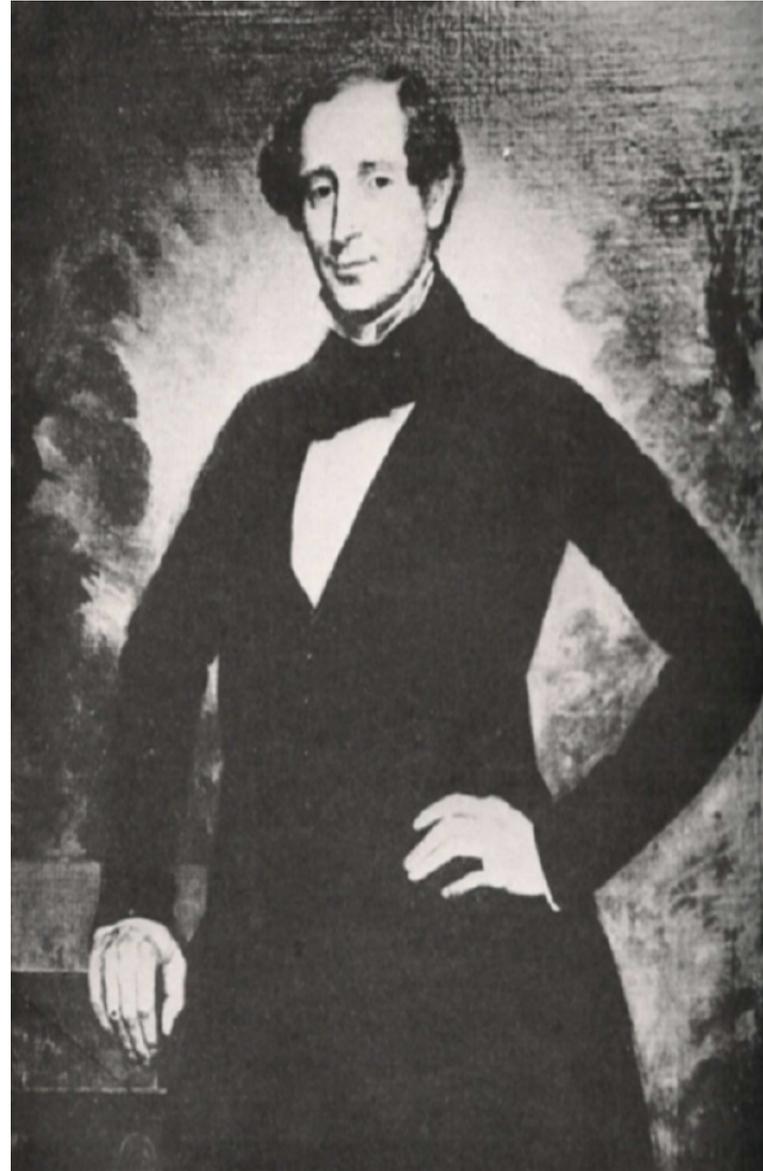
I have noted above that there are three inbred females that inherit the legacy of Miss Russell through Nutwood, they being Helen Hanover, Margaret Parrish and Oniska. These three mares between them, along with their respective maternal links through By By, Manette and Lida W, all daughters of Nutwood, are present in some combination in the maternal lines of virtually every top performer of today in North America.

Miss Russell is not alone in her influence on modern day pedigrees. There are other mares of Thoroughbred ancestry that are noteworthy including Kathleen and Midnight, like Miss Russell, both daughters of Pilot Jr, and Hatteras whose inbreeding 2x3 to the mare Betty Brown brings the legacy of Diomed forward through another channel. Kathleen is noteworthy as the maternal line of Spencer. Hatteras is the third dam of World Champion Dean Hanover, whose daughters produced Speedster, Hickory Pride and Hickory Smoke.

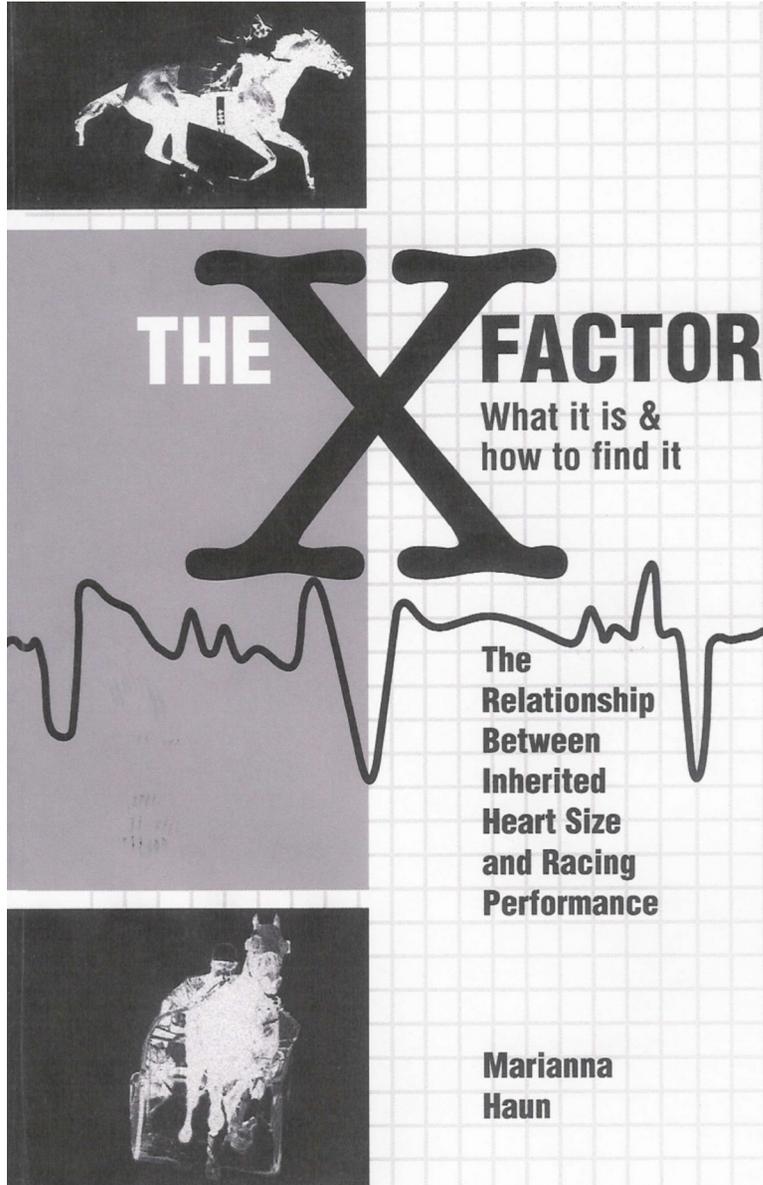
Tracing the early development of the top maternal families shows, however, that Miss Russell, with no extensive family of her own, is still the likely trigger to the success of other maternal families.

It would appear that many of these foundation mares did little themselves other than produce one daughter to carry on the family line and many of these maternal families went several generations before branching out into serious production of top performers.

The one thing that all of the top maternal families appear to have in common is that this branching out did not occur until triggered by an intersection with particular bloodlines, notably the bloodlines of Miss Russell and her son Nutwood and his daughters and their sons.



*R.A. Alexander, master of Woodburn Farm and the breeder of Miss Russell and many other foundation mares of the American Standardbred
Source: A Kingdom For The Horse – W Preston Mangum*



The book, *The X Factor*, published in 1997 and written by Marianna Haun, documents the discovery of this exciting new way of looking at what makes champion horses. Haun introduces her research as follows:

“On June 9, 1973, at Belmont Park, the Big Red Machine, as turf writers had dubbed him, accomplished a feat that will be talked about for generations. As America held its breath watching the race, the three year old Secretariat galloped away from the field to a 31 length victory to capture the third leg of the Triple Crown.”

“Sixteen years later that breath-taking race was explained. As the mighty stallion lay on an autopsy table, the research pathologists made a ground breaking discovery: They uncovered the largest heart ever found in a Thoroughbred racehorse, estimated at 22 pounds. The normal size is 8.5 pounds.”

“Surely heart was a characteristic of all great champions. But was the term one which described a personality characteristic or was it also a measureable physical attribute?”

“It was a matter worth serious scientific investigation”

THE X-FACTOR THEORY

One theory recently published, called the X-Factor theory, builds upon the maternal identity as pivotal in the evolution of the racehorse. There are some who would say that they put their faith in modern genetics rather than “outdated” theories. While the great advances in the understanding of genetics have played a role in the development of many species of plants and animals I am not so sure that the horsemen of today understand and apply genetic theory any more than any of their predecessors. There is, however, a school of thought, based on extensive studies in the University of Kentucky Equine Program, that strongly suggests the existence of sex related genes that are mutations of a normal gene traceable to a single source and can determine performance factors such as heart size.

What is it?

The X-factor is the name given to a genetic inheritance that is passed on the X or female chromosome. Females have two X-chromosomes and males have one X and one Y chromosome. Sons inherit their X chromosome from their dam and their Y chromosome from their sire therefore only the dam can pass the X-factor to a son. Daughters inherit an X chromosome from each parent. If the sire is out of a mare that carries the X-factor it will likely be passed to the daughter by the sire. Similarly if the daughter is out of a dam that carries the X-factor it will likely be passed on to the daughter by the dam. I say “likely” because the dam has two X chromosomes, only one of which is passed to combine with one from the sire in producing a daughter. The chances of the son or daughter inheriting the X-factor is assured if the dam carries it on both of her X chromosomes, and is what is known as a “double copy” mare.

The X-factor is believed to be a genetic trait that enhances performance by producing a large heart in the individual inheriting the gene. There may well be other sex related attributes, such as a more efficient cardio vascular system generally, or indeed deficiencies, that can be similarly passed,

we don’t know for sure, but there is considerable research underway to map the genes of horses. Those who have studied pedigrees recognize, however, that certain females in history appear frequently in the pedigrees of top individuals today and the X-factor theory seems to correlate with their occurrence and position in the pedigree.

Marianna Haun has documented *The X-Factor* theory in the book of the same name. While the author’s examples are drawn primarily from the Thoroughbred breed, she does offer some examples of its application to the Standardbred and the principles would seem to apply to the Standardbred breed as well. This is not surprising considering their shared maternal heritage.

Where does it come from?

While the source of the X-factor in Standardbreds has not been authoritatively established it is likely that the Thoroughbred sire named Diomed had a major role to play in its introduction to North America. To the extent that other maternal sources, such as the Canadian and the Norfolk Trotter, shared the same maternal legacy of the Brothers Childers, whether through Diomed or some other route, they also had a part to play.

In her book, *The X Factor*, Marianna Hahn speculates that the large heart phenomenon, verified through autopsy reports on outstanding horses such as Secretariat, originated with the Thoroughbred mare Pocahontas in the mid 19th Century. It is my observation that the source of the X-factor large heart gene may be traced right back to the beginnings of both the Thoroughbred and Standardbred breeds. The trail leads to the full brothers Bartlets Childers and Flying Childers, sons of The Darley Arabian. The former is the penultimate tail male in the Eclipse line, the most dominant sire line in world Thoroughbred breeding, while the latter is the foundation sire of the North American Standardbred through his descendant Hambletonian.

The Thoroughbred mare Pocahontas that Marianna Hahn suggests is the source is likely just another pretty face along the trail since her own maternal line goes back through Diomed's great daughters Young Giantess and Young Noisette and several other avenues to the Brothers Childers maternally.

Who has it now?

In North American Standardbreds the X-factor appears to trace back primarily through four individuals with Thoroughbred maternal lines that contain the presence of Diomed and these are Miss Russell, Midnight, Mambrino Patchen and American Star, all horses born in the mid 1800's. Individuals who show maternal traces back to one or more of these four individuals, particularly through inbred mares such as Oniska, Helen Hanover, Margaret Parrish, and several others, appear to be among the best performers of our day.

Any individual horse whose parents carry the X-factor trace may inherit it. Not all individuals that inherit the gene turn into world champions given all the other things related to conformation that they can and do inherit also. It is important for a filly to inherit the X-factor from both parents both for racing and breeding purposes. That is not the case for a colt. A male offspring, however, should have a dam that is a double copy to the X-factor to maximize his chances of inheriting the gene. That is why you see so many top male individuals today with no apparent X-factor connection from sire to dam, yet if you look at the dam herself, you will almost always find a buildup of the X-factor presence maternally, including a double up, or double copy, of one or more of the key inbred mares mentioned above.

In many cases these important mares do not show directly on a typical five or six-generation pedigree chart, but knowing the individuals through which a particular trace is available is an important part of recognizing the impact on modern pedigrees of these "ancient" mares. In pacing pedigrees Oniska is clearly part of the legacy of both Good Time and Tar Heel mares and

when you find a mare with a pedigree that shows a Good Time daughter in X-factor position in the sire and one by Tar Heel in the dam then you know you are dealing with a mare that is a double copy to Oniska. It is a similar situation in trotters with Stars Pride and Noble Victory, who both carry Oniska through San Francisco maternally. Adios and his full sister Adieu, sources of Adioo, are often seen across from other traces to Adioo through Dillon Axworthy as in the case of Artiscap's dam Delinquent Account who is a double copy to Adioo in this fashion, while her dam Al Dente is also a double copy to the same trace since her sire and dam are both from the maternal family of Miss Bertha Dillon by Dillon Axworthy. As we shall see later this concentration of Adioo is doubled up again in the pedigree of the outstanding filly Rainbow Blue.

Why Is It Important?

The use of X-factor analysis is another tool for evaluating pedigrees. It appears to have considerable significance especially when you break down the traces in certain top individuals. It is demonstrable that the top sires of today show multiple traces to the X-factor sources and their pedigrees feature one or more of the key mares that I have mentioned. In Cam Fella's case, probably one of the greatest sires ever of both sons and daughters, he has several individuals in X-factor position in his sixth generation including Adioo through Helen Hanover. The same is the case for Valley Victory who has built his dynasty in large part courtesy of his maternal presence of Margaret Parrish.

In his book *Patterns of Greatness*, Thoroughbred researcher Alan Porter noted the need to delve deeply into a pedigree to discover the underlying genetic strengths that are not apparent in the first six generations.

"This can reveal that one particular background cross has been built up to a point where it dominates a pedigree and reaches a critical mass reinforcing vital genes to the point where they explode in the form of a dynamic performer".

He further speculates that close inbreeding – especially to brothers, sisters and other genetic relatives – can bring about positive genetic mutations. Haun and others believe that the X-factor originated in a single female through a genetic mutation caused by inbreeding. Could that female be the Ancestral Mom in the form of The Spanker Mare – the product of breeding a son to his mother? Is she indeed the source of the X-Factor? It is entirely possible when you look at the influence of her grandsons Flying Childers and Bartlets Childers on the female side of the breeding equation in both the Thoroughbred and the Standardbred.

Faversham and Rasmussen, in their book *Inbreeding To Superior Females* also offer some thoughts on the X-factor theory and introduce another genetic theory based on something called Mitochondrial DNA.

“ The DNA of the Thoroughbred is contained within 64 chromosomes found inside the nucleus of the cell. The genetic makeup or genome of every Thoroughbred is a composite of the contributions of all of its ancestors. The fraction of genes in an individual’s genome attributed to particular ancestors is quite small. Any single gene in a fifth generation ancestor has only a 3% chance of reaching that individual...In other words the probability of duplicating specific genes from a single ancestor several generations back is mathematically remote and does not explain the statistical advantage inbred horses have demonstrated.”

“By the same token, the principles of sex linkage, specifically of the X chromosome cannot explain all of the effects of inbreeding.... Another type of genetic material with its own unique form of transmission is mitochondrial DNA that also is only inherited maternally. A foal’s mitochondria (the cell’s energy producers) are direct copies of the dam’s mitochondria. The transmission is, therefore, through the tail female line. Mitochondrial DNA or mtDNA is responsible for the encoding of numerous proteins involved in aerobic energy production. Unlike its nuclear counterpart the mitochondrial genome

contains very little redundant DNA that fails to code for gene products. It follows that mtDNA is particularly vulnerable to mutations. Any spontaneously occurring genetic alterations will most likely result in altered protein products, and with it, changes in the efficiency of energy production and utilization.”

Yet another area of interest has recently been written up by researchers who have discovered a sex based linkage in the ability of the blood of humans to absorb and, more importantly, to maintain high levels of oxygen. Research of the oxygen saturation of Hemoglobin in residents of high altitude communities indicates the ability to adapt to the stress imposed by oxygen deprivation or deficiency is a function of genetics. The gene responsible for this ability has been identified on the X-chromosome in humans.

Thus it would seem possible that the effect of the X-factor in horses may not necessarily be a function of heart size but rather a function of the oxygen carrying ability of the blood itself if it can be proven that the performance of certain horses is the result of the same kind of genetic adaptation.

In earlier times horse breeders would describe their performance horses as being “*of high blood*”, usually in reference to the degree of Thoroughbred influence in the pedigree, but perhaps unwittingly giving a clue to what really makes for exceptional performers, a higher ability to absorb and retain the high levels of oxygen required for performance under stress.

It is common practice in modern medicine to make use of an oximeter, a device that measures blood oxygen saturation, during and after surgical procedures. Such devices attached to a finger tip or toe, or through the placement of sensors on the head, can monitor and quantify the changes in blood oxygen saturation in the patient as the stress levels within the body fluctuate, providing a critical alarm system to indicate the need for emergency intervention.

Blood hemoglobin levels in horses are usually determined through actual blood analysis but the oximeter provides an instantaneous and non invasive way of obtaining comparable data. It would be interesting indeed if such measurements can be related to the X-factor and the pedigree as a predictor of future performance or an explanation of the past.

In recent times we have seen the advent of “blood doping”, the artificial stimulation of the blood to transport higher levels of oxygen for short periods of time. Such practices are under scrutiny by sports bodies worldwide and have been the object of investigations in such sports as cycling, track and swimming, all of which depend upon speed and endurance to produce winning efforts. Inevitably the sport of horse racing will face the same kind of scrutiny as unscrupulous trainers turn to synthetic products capable of producing the same effects on the blood of performance horses.

It is not for me, as a layperson, to debate the difference between one method of transmitting genetic inheritance versus another. There is, however, some genetic force at work maternally, in addition to that provided by the sire line, that is passing along in some fashion to certain individuals the ability to outperform their contemporaries. My own impression is that this special genetic legacy is indeed sex linked and might have more to do with the recessive nature of the gene than with the percentage chance of any single gene being passed on through the generations. It also may result from a combination of the two theories of X-factor and mitochondrial DNA since I have no reason to believe that their genetic impacts, both supposedly based on mutational changes, are mutually exclusive. In fact there appears to be two sex linked transmission processes at work that in effect support and reinforce one another at critical points in the pedigree. As Faversham and Rasmussen conclude:

“It provides a more plausible explanation of how inbreeding can create change at the cellular level. The greater the number of strains and the closer the generational level at which the

ancestor appears would thus increase the power or level of inbreeding to an ancestor.”

Perhaps some day soon, when researchers finally crack the genetic code for the genome of the horse, we shall better understand both the process and the effect. Until then I am prepared to accept that such an effect exists for whatever reason without getting bogged down in scientific debate.

In all this discussion of the seeming advantages of a sex linked genetic legacy that can dramatically improve performance, it is worthwhile to put things into context and Marianna Haun does this early in her book *The X Factor*. Her comments were made before the recent developments in blood research noted above that indicate that there may be some other explanation than heart size that bears further examination.

“That there had been great champions with normal sized hearts was not open to question. In every endeavor, equine and human, however, there have been individuals who have had such superb characteristics in other areas as to make up for a lack in one area.”

“Further the opposite side of the coin is true. The presence of a large heart in a racehorse has never been a guarantee of a winner.... Heart size will not help a racehorse to be a champion if he is unsound, has bad conformation, is not interested in running, is poorly trained, or any number of factors that can impact on the success or failure of a racehorse.

“There are those who have placed all of their credence in the horse’s conformation, and those for whom breeding is the only factor worth considering. The list of attributes which have been thought to be critical has changed with fashion and with the visible attributes of the latest champion.”

SUPERIOR FEMALES

Inbreeding is taboo amongst most breeders since the fear is that faults in the individuals will be duplicated and the result will be disastrous for not only the breeding in question but for the breed as a whole. Like so many things in life, however, inbreeding, when done in moderation, can be a very rewarding experience. The Spanker Mare, after all, is reputed to be the origin of the species when it comes to racehorses, and inbreeding cannot get any closer than was the case in her pedigree, the result of a mare being bred to her son.

In their recent book entitled “Inbreeding To Superior Females” Favershaw and Rasmussen have done an excellent job of explaining inbreeding as an approach to producing excellence in race horses and there are several quotes from their book that are worth repeating here. While their book deals with thoroughbreds the principles clearly apply to their cousins in the Standardbred world.

“Inbreeding is the duplication of an ancestor (male or female) within a stipulated number of generations of an individual’s pedigree.”

James C Harrison, in his authoritative chapter on bloodlines and breeding in the original United States Trotting Association book called “*Care And Training Of The Trotter and Pacer*” provides an excellent overview of breeding theories and in so doing defines inbreeding as occurring any time the sum of the generations of the duplicated individual is six or less. In other words if the individual occurs as the grandsire (second generation) and also shows up as the grandsire of the dam (third generation) the cross is 2x3 to that individual, a total of 5 and therefore inbred as would be such combinations as 3x3, or 2x4.

It is not my intent to make a case for or against inbreeding as a breeding strategy, but it would appear to have had an effect of long lasting significance on the performance of today’s race

horses particularly where it involves the maternal lines within the pedigree and certain superior female individuals.

In another quote from Favershaw and Rasmussen they ask: “*What makes a family superior? While most families (and certainly, the majority of their branches) never last for more than a few generations, those considered superior have endured over long periods of time. This is, of course, primarily dependent upon their ability to continue issuing important runners and producers. The most remarkable pattern amongst key representatives from families that have endured and thrived is the duplication of a maternal ancestor in their pedigree.*”

Throughout racing history there have been mares that have captured the attention of the public for their remarkable careers on the racetrack. All too often these mares have not carried on their excellence into the breeding shed, which must be one of the more puzzling aspects of Standardbred breeding. On the other hand there are many examples of mares that were unable to race for a variety of reasons that became stellar broodmares, in many cases outperforming their more illustrious full sisters that raced.

There are many reasons for the failure of any one mare to race to the potential in her pedigree, most of which are man made. There are also many reasons for the failure of successful race mares to become successful broodmares, most of which are also unfortunately man made. In this day of speed and high stress, accompanied by the chemical consequences of the pressure to win at all costs, it is little wonder that the stars of the track often fail miserably to pass along their talents to their offspring. Such was not always the case.

In the early 1900’s there were a number of mares that excelled on the racetrack that have proven to be an indispensable part of modern racing excellence by virtue of their presence in many of the pedigrees of today’s top performers.

HELEN HANOVER was a foal of 1927, by Dillon Volo from a mare by Dillon Axworthy. Since Dillon Volo was also from a Dillon Axworthy mare, Helen Hanover was inbred 2x3 to Dillon Axworthy. Dillon Axworthy was from the mare Adioo Dillon a daughter of Adioo, she being a daughter of Nutwood, son of Miss Russell. Adioo had several other significant maternal traces to the Spanker Mare. She had two to American Star since she was by Guy Wilkes, who carries both American Star and Mambrino Patchen maternally, and Adioo has a second dam by Dictator, also from an American Star mare. Adioo Dillon was by Sidney Dillon whose second dam was by Harry Clay. He had a dam by Jary's Bellfounder, as did Hambletonian, and the maternal line of Bellfounder traces back to a Bartlets Childers mare. The dam of Jary's Bellfounder traces to Bartlets Childers twice maternally which may help to explain the success of the daughters of Hambletonian as broodmares.

The 2x3 inbreeding to the legacy of Miss Russell, coupled with the other traces to Diomed and the Spanker Mare maternally that are present in Helen Hanover, has resulted in an exceptional number of the top performers of modern times and none more evident than the maternal legacy of Golden Miss, a daughter of Ensign Hanover, son of Helen Hanover.

In many ways Helen Hanover parallels Miss Russell as a broodmare. She produced several gifted racehorses for their day and several daughters that produced on, however it is through her son, Ensign Hanover, that her greatest impact has been felt.

Helen Hanover also had six daughters including Norette Hanover whose most famous daughter is Barbara Direct who has a maternal legacy that has produced fourteen performers that have made over \$500,000 and two millionaires in Village Connection and World Champion Jennas Beach Boy. The dam of Jennas Beach Boy, in fact, carries Helen Hanover twice since she is by Cam Fella whose third dam is by Ensign Hanover.

With that kind of maternal power it is highly likely that Jennas Beach Boy will be a sire of top fillies and excellent broodmares especially from mares that carry Helen Hanover. His best filly to date is from a mare by Dexter Nukes, who has a fourth dam by Bullet Hanover, grandson of Helen Hanover. His next best filly is Cannae Peach whose second dam is by Overtrick, a great grandson of Helen Hanover.

His best colt to date is Three Olives whose second dam is by Strike Out, a son of Golden Miss. It is no coincidence either that the mares that Jennas Beach Boy has succeeded with to date are strongly imbued with Adioo in their maternal lines, doubling up the same trace that exists in Helen Hanover. And that brings us back to Golden Miss and the other special daughters of Ensign Hanover

The top three daughters of Ensign Hanover turned out to be among the best known as broodmares as well. They were Golden Miss, Flaming Arrow and Mynah Hanover.

As the dam of Strike Out, Golden Miss provided another channel for the blood of Helen Hanover to flow through that sire's daughters and he too has become a remarkable influence as a broodmare sire.

Malaysia is the dam of multi millionaire Riyadh who took his record of 1:48.4 while beating the best aged pacers of his day. Shifting Sands had nine daughters producing to date eighteen \$100,000 plus winners.

Helen Hanover's influence is not restricted to the daughters of Ensign Hanover by any means. The daughters of Overtick, Bullet Hanover and Strike Out are now features of the maternal lines of such sires as Western Hanover, Cams Card Shark, Dexter Nukes, Falcon Seelster, Jennas Beach Boy, Real Desire, Rustler Hanover, Grinfromeartoear and Island Fantasy just to name a few.

Helen Hanover

Dillon Volo

Peter Volo
t,4,2:02

Peter The Great

Nervolo Belle

Dillon Axworthy

Miss Bertha Dillon
t,4,2:02 1/2

Miss Bertha C

Axworthy

Dillon Axworthy

Helen Dillon

Miss Pierette

Madam Thompson

Pilot Medium

Santos

Nervolo

Josephine Knight

Axworthy

Adioo Dillon

Baronmore

Marble

Axtell

Marguerite

Sidney Dillon

Adioo

Pilot Medium

Peter The Great

Santos

Guy Wilkes

Eva

Happy Medium

Tackey

Grand Sentinel

Shadow

Colbert

Nelly D

Betterton

Mambrino Beauty

Axtell

Marguerite

Sidney Dillon

Adioo

Baron Wilkes

May Wagner

King Clay

Medio

William L

Lou

Kentucky Prince

Young Daisy

Sidney

Venus

Guy Wilkes

By By

Happy Medium

Tackey

Grand Sentinel

Shadow

George Wilkes

Lady Bunker

Sultan

Minnehaha

Hambletonian
Princess
Pilot Jr
Jenny Lind
Sentinel
Maid Of Lexington
Octoroon Jr
Dixie
Onward
Queen B
Allie Gaines
Jenny
George Wilkes
Mother Lumps
Mambrino King
Allie Mambrino
William L
Lou
Kentucky Prince
Young Daisy
Sidney
Venus
Guy Wilkes
By By
George Wilkes
Belle Patchen
Strathmore
Mary S
Harry Clay
Modesty
Cooper Medium
Topsey
George Wilkes
Lady Bunker
Mambrino Boy
Bird Mitchell
Clark Chief
Kentucky Queen
Strideaway
Old Daisy
Santa Claus
Sweetness
Captain Webster
Harry Clay Mare
George Wilkes
Lady Bunker
Nutwood
Rapidan
Hambletonian
Princess
Pilot Jr
Jenny Lind
Sentinel
Maid Of Lexington
Octoroon Jr
Dixie
Hambletonian
Dolly Spanker
Mambrino Patchen
Lady Dunn
The Moor
Sultana
Stevens Bald Chief
Netty Clay

Helen Hanover is inbred 3x2 to **Dillon Axworthy**.

The second dam of Dillon Axworthy combines **Nutwood**, son of Miss Russell, with traces to **American Star** and **Mambrino Patchen**

MARGARET PARRISH is a mare that I have already touched on with respect to her pedigree but it is worth repeating that she, like Helen Hanover, was inbred 3x2 maternally to a sire linked to Miss Russell, in this case through Arion whose dam was Manette, daughter of Nutwood..

Margaret Parrish had several top producing daughters and knowing who they are and who their sons and daughters are, is important in tracking this connection. Some of the sires that have sprung from Margaret Parrish maternally are Rodney, Super Bowl, Valley Victory, Big Towner, Niatross and many others, and their daughters carry the Margaret Parrish influence accordingly.

She had fourteen foals, eight of which were fillies. Of the six males there were two, Guy Parrish and Arion Guy both by Guy Axworthy, which went on to a stallion career. Guy Parrish went to New Zealand where his daughters have created a maternal identity that pervades the breeding in both New Zealand and Australia. His daughter Helens Bay is the maternal line of the great Cardigan Bay, the first down under horse to ever win over \$1 million and one of the first to come to North America where he was competitive at the highest levels of the sport. Her other son, Arion Guy, saw limited action in North America and most of his daughters were bred in Sweden. Before leaving North America though he produced Aileen Arion, the maternal line of Bettors Delight and Matts Scooter.

The best of Margaret Parrish's fillies as a race mare was Margaret Castleton by Guy Castleton. This sire's dam was Emily Ellen and thus Arion was again present to give Margaret Castleton a double maternal trace to Arion just like her mother. She also picked up Midnight from the maternal line of Emily Ellen and like Barbara Direct, granddaughter of Helen Hanover, she became one of the first mares to inherit all four principal sources of Diomed in North America. She took a record of 1:59 ¼ in an era when such speed from trotting fillies was unheard of and went on to a stellar broodmare career.

In addition to producing a sire called Mighty Sun she had eight producing daughters. Mighty Sun's principal claim to fame is as the sire of the dam of the great Tar Heel mare Sunnie Tar, and the rest of his small production of mares were better than average in producing top performers. The daughters of Margaret Castleton, like their mother, were excellent broodmares as indeed were the daughters of Margaret Arion, the half sister to Margaret Castleton by Guy Axworthy..

Margaret Arion was a full sister to the first 3-year-old trotter to trot faster than 2:00, Arion Guy, but did not race up to her Kentucky Futurity winning brother. She has more than made up for her lack of speed with a tremendous run as a broodmare. In researching this book I reviewed the issues, from 1980 on, of Hoofbeats, the publication of the United States Trotting Association. I came up with only one article dealing with the maternal side of breeding, other than the excellent columns of Sidney Lerner, and that dealt with Margaret Arion and her legacy as the foundation of Valley Victory among others. She is also the fifth dam of Fresh Yankee, the first North American horse to earn over \$1 million.

To quote the author of the article, Dean Hoffman: *"Today Margaret Arion shows up prominently in the pedigrees of the three leading American sired money winning juvenile trotting colts of 1988. These colts are Keyser Lobell, Flying Irishman and Valley Victory. By any measure, that is a remarkable testimony to the lasting influence of this mare, coming as it did in 1988 – some 60 years after her first foal was born."*

The same should be said of her dam Margaret Parrish who is the real key to the success of her daughters through her inbreeding to the legacy of Miss Russell.

The ability of those individuals that carry the Diomed legacy to trigger mares into worthwhile production is evident and would appear to confirm that there is indeed a maternal legacy affecting performance that is being passed.

Margaret Parrish

t,4,2:06 1/4

Bingen
t,2:06
Vice Commodore

Narion

Arion

Lady Leyburn
t,3,2:23 1/2

Margaret Leyburn

May King

Young Miss

Arion

Nancy Hanks

Electioneer

Manette

Wilton

Rose Leyburn

Electioneer

May Queen

Young Jim

Miss Mambrino

Electioneer

Manette

Happy Medium

Nancy Lee

Hambletonian

Green Mountain Maid

Nutwood

Emblem

George Wilkes

Alley

Onward

Mamie

Hambletonian

Green Mountain Maid

Norman

Jennie

George Wilkes

Lear Mare

Red Wilkes

Miss Clark

Hambletonian

Green Mountain Maid

Nutwood

Emblem

Hambletonian

Princess

Dictator

Sophy

Abdallah

Charles Kent Mare

Harry Clay

Shanghai Mary

Belmont

Miss Russell

Tom Moore

Lady Sanford

Hambletonian

Dolly Spanker

Hambletonian

Lady Griswold

George Wilkes

Dolly

Star Almont

Kit

Abdallah
Charles Kent Mare
Harry Clay
Shanghai Mary
Morse Horse
Slocum Mare
Crocketts Arabian
Unknown
Hambletonian
Dolly Spanker
Lear's Sir William
Unknown
George Wilkes
Queen Dido
Alric
Kate
Abdallah
Charles Kent Mare
Harry Clay
Shanghai Mary
Belmont
Miss Russell
Tom Moore
Lady Sanford
Abdallah
Charles Kent Mare
Andruss Hambletonian
Isaiah Wilcox Mare
Hambletonian
Clara
Edwin Forrest
Sophronia
Mambrino
Amazonia
Imp Bellfounder
One Eye
Cassius M Clay Jr
Bellfounder Mare
Irons Cadmus
Jenny By American Star
Abdallah
Belle
Pilot Jr
Sally Russell
Jupiter Abdallah
Nelly Moore
American Star
Old Sorrel
Abdallah
Charles Kent Mare
Henry Clay
Telegraph
Abdallah
Charles Kent Mare
Flying Morgan
Kate By Black Hawk
Hambletonian
Dolly Spanker
Mambrino Chief
Fanny
Almont
Maggie Gaines
Longs American Boy
Gardner Mare

Margaret Parrish is inbred to **Arion** 3x2 maternally, a source of **Miss Russell**, and **American Star**

ONISKA is the dam of San Francisco, an unsung sire whose influence in pedigrees goes far further than his reputation. His sire line traces back to George Wilkes, a son of Hambletonian, but it is his maternal lines that have made him such an influence on the pedigrees of pacers and especially trotters worldwide.



San Francisco stood at Walnut Hall in Kentucky and his success as a sire did much to establish the reputation of that famous Kentucky farm. Source: The American Trotter

He was a foal of 1903 and in the words of John Hervey “*he was one of the most perfectly gaited stallions of his generation.*”

His dam was Oniska by Nutwood Wilkes and as noted earlier she was inbred 2x3 to Lida W, a daughter of Nutwood, son of Miss Russell. In addition Lida W is a three quarter sister in blood to California Nutwood, sire of Oniska’s second dam.

Oniska’s only foal of consequence was San Francisco and her inbred legacy to Miss Russell is carried forward solely by him through his daughters. One of these was Cita Frisco, dam of the epochal sire Volomite.

Volomite and Diomed had a lot in common. Both were great sires that produced exceptional racehorses, sires to extend the line and daughters who became part of the maternal foundations of their respective breeds. Foaled in 1926, Volomite was bred at Walnut Hall Farm in Kentucky. As a yearling he was sold for \$5,800 and the owners of the farm that stood his grandsire Peter The Great bought him. John Hervey closes his account of the story of *The American Trotter* with the story of Volomite, and describes him in glowing terms:

“ Not since his grandsire, Peter The Great, dominated the breeding perspective, has any other stallion risen to such pre-eminence and popularity as Volomite, commanded such universal and ungrudging homage, or more truly deserved it.”

His best daughter on the track was Scotch Rhythm 3,2:01 whose greatest legacy may well be that her maternal succession led to Varenne, the Italian bred trotting super star.

Daughters of Volomite are responsible for Tar Heel and Good Time, two of the most influential broodmare sires in modern pedigrees and the Tar Heel maternal legacy has been further extended through the likes of Bret Hanover and Albatross, both with Tar Heel dams maternally.

Perhaps the most influential maternal legacy on this continent, other than through the daughters of Volomite, however, is through Dillcisco, the second dam of Stars Pride. Dillcisco’s second dam was by Baron Dillon, another sire from a daughter of Nutwood, thus doubling up the legacy of Miss Russell through that sire again.

Oniska

Nutwood Wilkes

Guy Wilkes
t,2:15 1/4

George Wilkes

Lady Bunker

Nutwood

Lida W

Belle

Direct

Direct Line

Lida W

Bayline

Puss

Unknown

Hambletonian

Dolly Spanker

Mambrino Patchen

Lady Dunn

Belmont

Miss Russell

George M Patchen Junior

Rebel Daughter

Dictator

Dolly

Nutwood

Belle

Nutwood

California Nutwood

Fanny Patchen

Abdallah

Charles Kent Mare

Henry Clay

Telegraph

Mambrino Chief

Gano Mare

American Star

Roberts Mare

Abdallah

Belle

Pilot Jr

Sally Russell

George M Patchen

Belle By Bellfounder

Williamsons Belmont

Unknown

Hambletonian

Clara

Mambrino Chief

Fanny

Belmont

Miss Russell

George M Patchen Junior

Rebel Daughter

Belmont

Miss Russell

George M Patchen Junior

Laura

Mambrino
Amazonia
Imp Bellfounder
One Eye
Andrew Jackson
Lady Surrey
Cassius M Clay
Abdallah 1 Mare
Mambrino Paymaster
Eldridge Mare
Gano
Son Of Sir William Mare
Stockholms American Star
Sally Slouch
Tiger
Unknown
Hambletonian
Katy Darling
Mambrino Chief
Belle Lupe
Canadian Pilot
Nancy Pope
Boston
Maria Russell
Cassius M Clay
Mare By Headem
Bellfounder
Unknown
American Boy
Prunella

Abdallah 1
Charles Kent Mare
American Star
Mckinstry Mare
Mambrino Paymaster
Eldridge Mare
Ben Franklin
Nance
Abdallah
Belle
Pilot Jr
Sally Russell
George M Patchen
Belle
Williamsons Belmont
Unknown
Abdallah
Belle
Pilot Jr
Sally Russell
George M Patchen
Belle
Unknown
Unknown

Oniska is inbred 2x3 to **Lida W**, a daughter of Nutwood, he a son of Miss Russell
Her dam, Bayline, is inbred 3x3 to **Nutwood** on sire line.

CR KAY SUZIE is a name with which every modern harness racing fan is familiar. What may not be as well known is the extent of the inbreeding of this record smashing trotting filly born in 1992.

She was profiled in an article in the May 1995 issue of Hoofbeats not so much for her pedigree as for her exploits on the track as a two year old and her promise to be one of the top three year olds of the year.

Bred by Carl and Rod Allen of Florida, she was a smallish but powerful filly by Royal Troubadour. His dam was Mae Jeans Crown and a full sister to Speedy Somolli. Cr Kay Suzie's dam was by Speedy Somolli thus inbreeding the siblings 2x2 maternally. In addition to her inbreeding she carries four maternal traces to the inbred Hatteras through Dean Hanover

Rod Allen was opposed at first to the breeding because he, like most other horsemen, felt they were taking a chance with close bloodlines. Kimbeley Rinker quotes him in the article as follows:

"Maybe this is what makes things work sometimes in a bizarre sort of way. You've got to take some risks sometimes with breeding and go beyond the limit. I never agreed a whole lot with inbreeding ten years ago, but the more I've seen crosses like this work, the more validity I think it has."

It was Carl Allen who thought that the two individuals had more to gain from doubling up their good points since both were well-conformed and well-mannered individuals with no apparent faults. *"I'm sure that at a typical breeding farm this kind of thing would never have taken place."* he concluded.

Cr Kay Suzie's first foal, Cr Excalibur, was a top two year old that did not race much at three due to illness. Her future as a broodmare seems secure but her long term impact on the maternal identity may be even greater as a mare in the mould of Margaret Parrish.

The most recent example of maternal inbreeding resulting in a superior female performer is Rainbow Blue who, like Helen Hanover and Margaret Parrish, is inbred 3x2 maternally and interestingly it is to On The Road Again whose dam is a double copy to Adioo, the same maternal influence in Helen Hanover. This type of extreme return of bloodlines is rare but nevertheless appears to be very effective if the individual is a female.

The concern with the possible negative impact of inbreeding on both the individual produced, and the future of the breed generally, is not something to be ignored. We are already seeing the results of a diminishing number of sire lines in the rising number of prospective stallions with fertility problems.

There is, however, in my mind at least, a significant difference between male line, or paternal, inbreeding and maternal inbreeding.

There are no instances of horses, that I know of, that are inbred on their sire lines through the sire and the broodmare sire, so called paternal-paternal, that have in any way contributed to the extension of any sire line. By inbred I mean in the sense of the 2x3 and 3x2 matings of the mares we have looked at.

The same cannot be said for the effect of maternal inbreeding on the sports leading maternal families, as we shall see.

We are, however, seeing more and more close breeding on sire line and indeed there currently is one top performer, a pacer called Aba Daba Doo by Cams Card Shark, who is inbred paternally 2x3 to Cam Fella. Although he was not noted early in his career he has developed into an invitational pacer with career earnings of over \$480,000 as of this writing.

The instances of maternal inbreeding that I have documented are, for the most part, long ago in history and are far from the memories of most now involved in the breeding of Standardbreds. The fact that these inbred mares continue to

make their presence felt in modern pedigrees is also little recognized.

The lack of interest in maternal inbreeding over the past half century has been largely the result of the emphasis on the contribution of the sire and a focus on sire lines. The taboos associated with incest in the minds of most breeders are also a deterrent since there has been little differentiation between paternal and maternal inbreeding, at least not up till now.

Inbreeding to superior females appears to be a valid concept that has considerable historical fact to back it up. Faversham and Rasmussen have lit the flame and are carrying the torch for this approach to breeding better and faster horses.

The importance of maternal families has long been recognized by pedigree researchers but has for the most part been lost in its significance to all but a few of today's breeders and owners. As recently as ten years ago it was not uncommon to see the maternal family listed on the catalogue page at major sales. This practise has, unfortunately, been largely done away with. It was also not uncommon to see articles on the leading maternal families in trade publications and those by Sidney Lerner in the USTA publication Hoofbeats were particularly noteworthy, although no longer published.

We have noted several instances of maternal inbreeding in Standardbred history that would appear to have played and continue to play an important role in the production of the top performers of today. The extent to which this is recognized is uncertain since it is also my observation that most breedings are not in the least based upon line breeding, inbreeding, maternal families or any other theoretical aspect of pedigree.

Faversham and Rasmussen hit this nail on the head directly with these observations.

“ The predominant force in breeding is rarely concerned with breeding theories. The sales consignor is primarily occupied with the bottom line – what will be responsible for the foal realizing top dollar. This requires a “name” sire or stallion and a black type family with known relatives without regard to the structural nuances in the pedigree. The first two generations generate the horse’s profitability.”

“In other words, in the majority of world class sales, breeding what is considered “the best to the best” will consistently bring the highest prices. This practice, despite some notoriously abysmal results, produces enough superior racehorses, as one, percentage wise, has a right to expect. Therefore commercial breeders may find little reason to change their marketing strategies or tactics. Caveat Emptor.”

While these comments are aimed at the practices of the Thoroughbred industry they are very pertinent to the conduct of Standardbred breeding as well.

It is not my intention to take sides in this issue of theory versus the bottom line, nor on the question of inbreeding, maternal, paternal or otherwise. These issues are best left to the individual to make his or her own mind up. I can only hope that the information found in this book will assist in that process.

In his book *The Kentucky Harness Horse*, author Ken Carr comments:

“It was John E Madden, master of Hamburg Place and known as the wizard of the turf, who said that the mare is the larger part of the foal and the stallion is the larger part of the farm. Madden is the only breeder ever to produce the winners of both the Kentucky Derby for Thoroughbreds and the Kentucky Futurity for trotters. The modern Standardbred is indebted to Kentucky for the serious planning that produced the outstanding horses of the Bluegrass breeders“

THE CORRECT PEDIGREE

RETURN TO THE SIRE

“There is a model of breeding that is like a pattern, and the pattern persists over generations, although, of course, the names change. I like to see a mare that is inbred, and a sire that is not.”

The words of Marg Neal echo the old maxim that has been part of standardbred breeding since its very beginning in the early 1800's.

“Return to the sire the best blood of his dam”.

Marg also stated in the same interview in Hoofbeats that

“ I've always talked about breeding for dominance – finding the individual that is the strongest aspect of the mare's pedigree, then finding the stallion that has that individual in a certain place in his pedigree.”

The question, of course, is which is the dominant individual and where in the pedigree of the sire should we find him or her?

There is no single answer to that question and there are many variations of this theme in the top performers of today but for the most part they share the same general pattern of outcrossing on sire line and inbreeding maternally by returning the principal individuals in the dam to the same individuals in the maternal lines of the sire.

In researching top horses it is clear that certain individual sires appear more frequently than others. On the pacing side we see Abercrombie, No Nukes, Meadow Skipper, Big Towner and Albatross on both sides of the pedigree in the maternal lines. In trotters the most common are Valley Victory, Speedy Crown, Super Bowl and most recently Garland Lobell.

A large majority of the top performers of the sport today exhibit patterns based on returning to the sire the best blood of his dam and including one or more of these key individuals.

The frequency and position in the pedigree of such individuals provides a useful way of describing what is happening in the pedigree of any particular horse and indeed in the pedigrees of any group of horses related through the same sire.

A horse could be described as a Speedy Crown line from a mare line bred or inbred to Speedy Crown and with Super Bowl or an Abercrombie line from a Meadow Skipper line mare that is inbred to Abercrombie.

When you look at groups of horses by the same sire you will inevitably see a general pattern repeated in the sire's top performers. While there are always exceptions to the general rule these exceptions in themselves are usually explainable and become another facet or factor in the creation of a stallion profile, arguably one of the best tools there is in making a stallion selection for a mare.

Profiling is a standard approach to targeting for success in many endeavours whether you are selling something to a known demographic or keeping the streets safe from crime.

How then do we translate this into practical application in selecting a sire or picking out a yearling? Before we answer that question we must first look at the broodmare to see if we can determine what she has to offer.

Not all mares should be bred. We have all heard about people who keep a lightly raced or unraced mare because she was in their words, a nice little mare to work with and even if she did not succeed on the track she could still be a good broodmare. Or perhaps she will not - how can we tell. It is a question of pedigree, performance, and percentages. Time to do your homework

PEDIGREES - THE FOUR P'S

DOING YOUR HOMEWORK

Performance

Speed and earnings in the family

Percentages

Cross success in the mare and the proposed mating

Profiles

Suitability of the mare to the stallion based on stallion profile

Patterns

Patterns of success that produce Champions

The secret to good research is consistent methodology - in other words taking it one step at a time in a standardized sequence that ultimately achieves your goal of making a breeding or buying decision based on pedigree. As noted earlier the choice of a breeding is the only decision that a breeder cannot undo once the mare is in foal so it is clearly the most important decision a breeder can make and deserves to be treated accordingly.

The Standardbred is a performance horse that originally had to meet a certain speed standard to be so considered. Nowadays, however, it is not about how fast they are but how much money they can make.

The bottom line here is that less than 5% of the pacers and trotters bred in North America will earn over \$100,000 lifetime. A correct breeding decision gives you a chance at 25%.

Performance

Behind every horse there is a history in the immediate family of the racing records of various relatives. The speed and earnings in the family is critical information, especially the latter, since the bottom line in breeding is to produce something that will pay for itself both in monetary reward to the breeder and to any purchaser who may be interested in buying another one if this one makes significant money.

As an engineer I am familiar with "putting a number on it" as a basis for evaluating options. The racing statistics are based on numbers such as race records and earnings. Those that are successful are highlighted in the pages of the sales catalogs by having their names bolded and capitalized although the basis for that designation is no longer valid in these days of extreme speed. A record of 2:00 or better gets you bold type but it probably should be at least 1:55. Making \$100,000 also gets you bold type but there are a lot of older horses, just over that limit, that have earned that status racing for several years in low level races.

Another problem with race records is that they are taken on different size tracks with as much as five seconds between a record on a mile track as opposed to one on a half mile track. Then you have the horses that were race timed much faster than their winning record.

In my approach I develop two numbers, one based on speed that I call the speed rating or SR, the other is the earnings rate - ER. Then I combine them into an overall performance rating - PR. I have guidelines to adjust for age at record and track size and create a number from 0-75. Earnings in the family are important so I look at the top earners in each of the first three dams and weight their contribution to establish an ER ranging again from 0-75. The maximum PR, the sum of SR and ER, is then 150.

Speed Rating - SR

A record of 2:00 or slower equates to 0 and each fifth of a second faster counts for one point, each second is worth five points. A record of 1:55 is therefore worth 25 points and the ultimate of 75 equates to 1:45 which has not yet been achieved but we are getting close with two horses in 1:46 in the past two years.

Trotters are slower than pacers so they tend to have SR values of around 4 seconds slower. The fastest trotter is now 1:49 with several around 1:50. These fast records are almost always taken over mile tracks so we need to use an adjustment for records taken over smaller tracks to normalize the speed rating for such performances. The rule of thumb is a five second adjustment for half mile tracks, three seconds for 5/8th tracks, and one second for 7/8th tracks. This is obviously somewhat arbitrary especially when racing at speed venues such as Delaware where sub 1:50 miles are possible. It does, however, give some basis for comparison and exceptions can always be further adjusted.

Aged horses will take faster records faster than two and three year olds and three year olds faster than two year olds. I want to normalize all records to be equivalent to three year old performance on a mile track so two year olds are allowed a two second (10 point) adjustment, four year old records are penalized by one second and older horses two seconds. So how does this all work out ?

Two year old with record of p.2,1: 52.4f
1.52.4 is 36 points, add 10 points for two year old and 15 points for a 5/8ths track and the total is $36+10+15 = 61$ SR

Aged horse with record of p.7,1.46.2m
1.46.2 is 68 points, deduct 10 points for aged record and no track adjustment at a mile track and the total is 58 SR

Three year old trotter with record of 3,1.58h
1.58.0 is 10 points plus 25 for half mile track, no age adjustment and the total is 35 SR

Earnings Rating - ER

Recent earnings in the family carry more weight than the earnings of horses in the second and third dams so I weight them on a basis of a maximum of 40 points for the dam, 25 points for the second dam and 10 points from the third dam for a total of 75 maximum.

If the top earner in the dam has \$400,000 or more that gets the maximum 40 points or one point for each \$10,000 in earnings. For the second dam the maximum of 25 points is awarded on the basis of one point for each \$20,000 in earnings. The ten points for the third dam are based one point for each \$30,000 of earnings by the best earner.

If the mare is a maiden or has no foals of racing age or fewer than four foals total then the earnings used are those of the mare herself or of the best foal whichever is highest but her earnings are adjusted down with each successive foal to half for the second foal, one third for the third foal and one quarter for the fourth foal etc.

Example

Mare has earnings of \$120,000 and has two foals with no earnings, best performer from the second dam has \$320,000 earned and third dam top earner has \$120,000 made.

The points are 4 for the mare based on one third of 12 points based on her own earnings and breeding her third foal, plus 16 points from the second dam and 4 from the third dam for a total of 32 points ER.

All of this is a bit difficult to visualize but the charts at the end of this section will provide a step by step calculation process that you can follow. Ultimately you will be able to do quick calculations on the edge of the pedigree page with practice.

Performance Rating - PR

With speed and earnings now reduced to common numbers we can now create a performance rating by simply adding the SR and ER together and the result is a number upon which you can compare, on a relative basis, the value of the horse as a potential racehorse, stallion or broodmare.

Such ratings are not a new approach. In Sweden the Swedish registry uses what is called a BLUP rating which ranges between 0-120 and in thoroughbreds the performance index has a range from 0-150. Both of these approaches factor in the sires to some extent as well as performance in major races but that is an even more subjective consideration.

Ratings are not absolute but rather they serve as an order of preference with the higher rated ones obviously based on faster speed and higher earning capability in the family.

Rating yearlings gives a list in order of priority for inspection prior to purchase. Rating the broodmare gives you an idea of what level her offspring may be capable of achieving on the track or in the case of prospective broodmares whether or not they should even be bred.

To make these decisions you have to set some limits and an ongoing review of actual performance versus PR is part of the homework process. For broodmares to succeed at the highest levels of the sport you need a minimum PR of 80 points for pacers and 60 for trotters. Breeding for regional stakes programs you will need minimums of 60 for pacers and 45 for trotters. Anything below these regional levels is unlikely to succeed in producing anything that makes anybody any money based on my continuing review of past history.

Once you have determined the mare is worth breeding, and at what level, then it is time to look more closely at her pedigree and the percentages of success for similar mares.

Percentages

The Cross

Most broodmares are not unique in terms of their sire - broodmare sire cross. There are others. A standard feature of most websites dealing with horse pedigrees is the so-called Crosses Of Gold list where sires with high earnings per foal from mares by a certain broodmare sire are listed. This information has some basic appeal but can be very misleading when the sire has perhaps just one very good one that picks up the average of a lot of lesser individuals.

There is more to a mare than just her sire as I have earlier noted. As a secondary check on the successful broodmare crosses for Bettors Delight mares you should also check out what kind of Bettors Delight mares they are by looking at the statistics for a mare that is Bettors Delight - No Nukes for instance if that is the mare you are researching. Knowing the success of such a cross both in producing successful race mares and broodmares is very important.

Bettors Delight is 31.4% in producing \$100,000 winners, 25% with his race mares and just 15.5% with his broodmares. The Bettors Delight - No Nukes cross is 42.3%, 34.4% and 17.7% respectively with one exceptional one by Mach Three but just four others over \$200,000. Obviously not every Bettors Delight mare should be bred and in fact mares from lesser sires can be better investments. Bettors Delight's dam is by a modest Ontario sire in Armbro Emerson for example.

A good racing cross is generally a good breeding cross and success rates closely parallel each other. If the mare is by a sire that has no broodmare credits at least you can look at the racing success as an indicator of future breeding success. An average cross percentage of 15% is considered acceptable but the higher the better is always something to strive for.

Cross Analysis

Elle Blue Chip Bettors Delight - Chutney Hanover - No Nukes
PR 71 - 1.52.0

Bettors Delight	Performers	\$100K	%
All Horses	1996	626	31.4
Mares	987	247	25.0
As Broodmares	1077	167	15.5
Best by Mach Three, Somebeachsomewhere, Shadow Play			

Bettors Delight - No Nukes

All Horses	78	33	42.3
Mares	32	11	34.4
As Broodmares	62	11	17.7
Best by Mach Three, Big Jim, Well Said,			

At the time of breeding Elle Blue Chip was unraced but from a deep family and with a 3/4 brother that had made over \$400K. Her rating was 71 when bred regionally for Ontario and Mach Three had shown interest in Cam Fella line dams or dams with Cam Fella line maternally with several of his top 20 being from such dams.

An interesting observation is that most of the sires that are working best with Bettors Delight mares have a Direct Scooter line in their dams or are by a Direct Scooter line sire. While this is not entirely explainable it cannot be ignored as it is responsible for nine of the top ten from Bettors Delight mares - that is what is known as a "nick" and worth looking for.

The broodmare sire profile for Bettors Delight also shows that 19 of the top 20 have an Adios/Abercrombie line and/or a maternal dam through a son of Meadow Skipper, usually Albatross, which follows on from the sire profile for Bettors Delight which favors that combination in many of his best performers and is a reflection of his own maternal lines.

Profiles

Stallion Profiles

The most important aspect of pedigree matching is ensuring that the broodmare pedigree satisfies the profile of the chosen sire with respect to his top performers. The sire profile is established early when the first crop races and does not significantly change over the stallions career although it does tend to become more defined with respect to particular characteristics or "nicks" as they are referred to.

The profile of any stallion is based on the principal sire lines in the pedigrees of the dams of his top performers based on earnings. In simple terms a successful profile match occurs when you have a mare that has in her pedigree the same sire lines as occur in the dam of the sire. This is the essence of a long established breeding approach based on "Return to the sire the best blood of his dam".

If you take the top performers by any sire and tabulate them in such a way as to show their maternal sire lines you will see some interesting patterns emerge. Looking at these patterns it is possible to write a one sentence description of the profile of the type of dam with which the sire in question does best.

In the case of Bettors Delight such a sentence would be one that suggests the following :

Non Meadow Skipper line dams with the exception of dams linebred or inbred to the Meadow Skipper line and have an Adios/Abercrombie line maternally.

This is based on several other sires with maternal lines similar to those in the dam of Bettors Delight, those lines being Armbro Emerson (Abercrombie) - Albatross (Meadow Skipper) lines, and the fact that Bettors Delight is himself a Most Happy Fella (Meadow Skipper) line sire.

NA Top 14 Sire Profile For Bettors Delight (1998) Sire Maternal Lines Armbro Emerson - Albatross

All Bets Off	2011	H	3,186,658	Dexter Nukes <u>19</u> <u>47.37</u>	No Nukes	Albatross	Horton Hanover <u>2</u> <u>50.00</u>	Bye Bye Byrd
Darlins Delight	2003	M	3,024,304	Big Towner <u>32</u> <u>34.38</u>	Gene Abbe	Shadow Wave	Bret Hanover <u>56</u> <u>17.86</u>	Meadow Skipper
Bettor Sweet	2005	G	2,816,687	Falcons Future <u>10</u> <u>30.00</u>	Falcon Seelster	Oil Burner	Nero <u>9</u> <u>11.11</u>	Fly Fly Byrd
Southwind Tempo	2004	M	2,445,541	Artsplace <u>325</u> <u>24.84</u>	Abercrombie	Albatross	Big Towner <u>87</u> <u>37.93</u>	Maynard Hanover
Betting Line	2013	H	2,238,518	Western Hanover <u>197</u> <u>30.43</u>	No Nukes	Albatross	Camtastic <u>17</u> <u>11.76</u>	Big Towner
Bettors Edge	2009	G	2,204,531	Life Sign <u>108</u> <u>32.38</u>	Abercrombie	Albatross	Jate Lobell <u>142</u> <u>30.99</u>	Meadow Skipper
Bettors Wish	2016	H	2,095,808	Western Ideal <u>127</u> <u>30.00</u>	Western Hanover	Abercrombie	Artiscape <u>61</u> <u>21.31</u>	Matt's Scooter
Caviart Ally	2014	M	1,956,238	No Nukes <u>78</u> <u>42.31</u>	Oil Burner	Overtrick	Nihilator <u>34</u> <u>14.71</u>	Tyler B
L A Delight	2013	M	1,782,999	Western Hanover <u>197</u> <u>30.43</u>	No Nukes	Albatross	Camluck <u>32</u> <u>34.38</u>	Falcon Seelster
Betterthancheddar	2008	H	1,636,086	Camtastic <u>9</u> <u>11.11</u>	Cam Fella	Albatross	Adios Vic <u>7</u> <u>0.00</u>	Tar Heel
Kenneth J	2004	H	1,592,755	Artsplace <u>325</u> <u>24.84</u>	Abercrombie	Albatross	Nihilator <u>76</u> <u>23.68</u>	Tar Heel
See You At Peelers	2008	M	1,566,900	Western Ideal <u>127</u> <u>30.00</u>	Western Hanover	Abercrombie	Dragons Lair <u>20</u> <u>35.00</u>	Nihilator
Forensic Z Tam	2004	G	1,352,406	Falcon Seelster <u>142</u> <u>21.99</u>	Warm Breeze	Overtrick	Governor Skipper <u>13</u> <u>23.08</u>	Tar Heel
Dynamic Youth	2009	G	1,227,793	Western Hanover <u>197</u> <u>30.43</u>	No Nukes	Albatross	Artsplace <u>231</u> <u>31.60</u>	No Nukes

Comments:

1. Most Happy Fella line dams (8) with Adios/Abercrombie and/or Meadow Skipper son/Albatross line maternally (8)
2. Adios/Abercrombie line dams (5) with Meadow Skipper son/Albatross line maternally (5)
3. Big Towner line (1) dam with Adios line and Meadow Skipper line maternally.

Notes: Three of top five have a Big Towner line. Cross statistics are shown for the dam and the maternal cross and show as total horses with the cross and the % of \$100K winners.

The Stallion Finder

In my recent investigations I have found that siring success is predictable based on identifying the principal sire lines at work in the dam and breeding to sires that carry the same maternal connections. This appears to occur regardless of the sex of the offspring. It is, therefore, possible to predict which mares are suitable for which sires regardless of the names of the sires involved but based strictly on which maternal lines they carry.

This correlation of effect between sires with similar maternal lines is clearly evident when sires are grouped according to common maternal lines and their profiles compared. Invariably it is the case that similar sires will have a general profile statement in common although they each individually may also have a more specific profile with special features worth noting.

The general profile gets you into the right ballpark and the special features allow you to find the right seat using what I call the Stallion Finder tables. Each year the Stallion Finder is posted on the pedigreematching.com website and it contains all of the deemed commercial sires standing in North America listed by sire line, alphabetical by name and by jurisdiction.

If you take all of the active sires and list them according to their maternal lines, sorted first by the sire line of the first dam, then the sire line of the second dam you will confirm that the sires with common sire lines do indeed react in similar fashion to the same type of mares. Adding in new sires without production in the appropriate sequence gives you a predicted profile that will be helpful in deciding which mares he can be bred to or which of his first crop yearlings will be the ones with the highest chance of success based on pedigree.

By evaluating your mare for possible breeding success and choosing a sire that has shown, through his profile, that he provides a suitable match on sire lines you now have a pathway to creating something special.

Patterns

Matching Scenarios

Using the charts in the Appendix you first have to identify the sire lines at play in the mare.

Determine the sire lines in the pedigree of the mare in the following combinations:

1. The sire line and dam sire line of the broodmare sire. e.g. Artsplace is by Abercrombie, dam by Albatross
2. The sire line of the 1st dam and the sire line of the 2nd dam.
3. The sire line of the 2nd dam and the sire line of the 3rd dam.
4. A combination of #1 and #3

Matching Scenarios

Scenario #1 - The most common scenario is when sires have maternal lines that are the same as, or very similar to, any of the above combinations since such patterns are responsible for most of the top performers. It is preferable but not essential to match individuals in the sire line, for instance instead of Albatross you could use another sire by Meadow Skipper or a son of Albatross. The closer you can get the better the result appears to be.

Scenario #2 - There is a second scenario when dealing with stallions or mares that have sire lines other than the more common Adios and Meadow Skipper lines for pacers or the Speedster and Stars Pride lines for trotters in the pedigree. Lines such as Big Towner, Volomite, and Good Time for pacers and Axworthy in trotters can usually be worked around if no suitable matching sire is found. Such was the case for Pacific Rocket who was by Albert Albert from a Direct Scooter – Happy Motoring mare. His best performer is the \$3 million plus earner Boulder Creek whose dam is by a son of Big Towner and features Albatross (Meadow Skipper) and Bret Hanover (Adios) lines doubled across her pedigree.

It is no coincidence either that the maternal lines of Albert Albert are Albatross and Bret Hanover. This is a situation that shows up frequently in individuals that appear outcrossed maternally as a result of Volomite or Big Towner line broodmare sires. Four of the top five by Pacific Rocket show this pattern of the mare returning the maternal sire lines that exist in the grandsire rather than the ones in the dam of the sire. Pacific Rocket did, however, find some mares that combined the Volomite and Meadow Skipper lines of his own dam and his fifth best performer was from a mare by Beach Towel, a Meadow Skipper – Bye Bye Byrd (Volomite line) combination.

Scenario #3 - A third matching scenario occurs when a mare has two sire lines which are the same and feature the same individuals, and the match is made by ignoring these and matching to the other two principal sire lines. Such was the case for Totally Western where ignoring the two Bert Abbe lines resulted in matching the remaining Meadow Skipper/Good Time line combination to Western Hanover's dam.

As you look at the patterns that exist in the pedigrees of the best performers you will see that there are definite repetitions but that the degree and location of the repetition in the pedigree can vary from sire to sire, except that is when the sires have identical or very similar maternal combinations. I mentioned earlier that trotting stallions that have Speedy Crown dams have a very consistent profile and it reads as follows:

Non Speedster line dams with the exception of double Speedster dams or Speedster line with Super Bowl line 2nd dams.

The sons of Valley Victory from Speedy Crown mares, Muscles Yankee, Lindy Lane, Donerail, and Yankee Glide among others, all have the same profiles with minor exceptions.

Yankee Paco, a son of Balanced Image from a Speedy Crown mare got off to a slow start even though his profile was predictable based on that of Muscles Yankee. The two sires, although by different sire lines, have dams that are full sisters in

blood. The breeders of his first crop, however, seemed to have guessed wrongly preferring to breed to Speedster line mares perhaps on the basis that Balanced Image himself showed such a preference. A large majority of Yankee Paco's first crop was bred in this fashion and in so doing the breeders hurt Yankee Paco's chances to prove himself early in his stud career.

An interesting parallel between Muscles Yankee and Yankee Paco is that both have produced good performers from mares by Garland Lobell. That sire is a grandson of Noble Victory from a Speedy Crown mare, thus mirroring the Speedy Crown – Noble Victory lines in the dams of both Muscles Yankee and Yankee Paco. Other sires that have produced top performers from Garland Lobell mares include the best one by Self Possessed, a sire whose dam is by a grandson of Noble Victory with a dam by a son of Speedy Crown.

While many sire profiles are quite broad in description and at first glance can accommodate a broad range of mares, there are some groups of sires that are exceptions that have a very specific "nick" to them. Rock N Roll Heaven and Pet Rock are almost identical pedigree wise although from different mares and they both lean towards mares with Big Towner maternally. While this is not readily explainable it is a part of their profile and cannot be ignored. In trotters the sons of Cantab Hall have a strong tendency towards Noble Victory line dams or at least dams with a Noble Victory line maternally. That no doubt comes from Cantab Hall's dam by Garland Lobell. This feature has been evident since early on and is showing even more so with the best by his son Father Patrick with all of his top 20 showing that pattern. Look for this to continue with his son Greenshoe.

But there are other very important patterns that have produced some of the top horses in recent years.

You may not find a sire in your area that will provide you with one of the following types of pedigrees but if you do you could have the next champion trotter or pacer.

Patterns of Success

The Double/Double pattern (DD) is when all four lines in the dam are returned to the maternal lines of the sire and those of the grandsire. The two fastest pacers, Always B Miki and McWicked are examples of the Double/Double. In trotters Hannelore Hanover, Chapter Seven and Muscle Hill among others are DD.

This is a pattern that I touched on earlier where sires with mixed sire lines maternally will often connect with mares that have the same sire lines as the dam of the sire's own sire.

Always B Miki's dam has principal lines through Abercrombie (Adios), Albatross, Big Towner, and Bret Hanover (Adios). His sire is Always A Virgin with Big Towner and Albatross lines in his dam.

That in itself is a significant plus since it matches all three of the above listed matching scenarios but Always A Virgin's sire Western Ideal has a dam with Abercrombie and Meadow Skipper so the lines in the dams of both sire and grandsire are replicated in those of Always B Miki's dam - a double/double match.

In similar fashion McWicked's dam is Western Ideal (Most Happy Fella line) - Abercrombie (Adios line) - Albatross - Matts Scooter (Volomite line) and the maternal lines of McArdle and his sire Falcon Seelster are through Overtick (Volomite), Adios Butler (Adios), Nihilator (Albatross) and Most Happy Fella - another double/double

In trotters Hannelore Hanover, Mission Brief, Six Pack, Gimpanzee, Manchego and Greenshoe are just a few of the champions with DD pedigrees.

If you cannot come up with a sire that gives you a DD pattern pedigree you may be able to find another one if your mare happens to be inbred maternally to a sire like Abercrombie or Speedy Crown. Such was the case for Jimmy Freight and Marion Marauder who have a TB pattern match.

The Top and Bottom pattern (TB) occurs when the sire line of the stallion is maternally inbred in the mare i.e. mare lines 2 and 3, 2 and 4, or 3 and 4 are the same sire line. The richest trotter of all time, Moni Maker, is a TB to Speedster being by Speedy Crown (Speedster line) and from a dam inbred to Speedster.

One of the top 3 year olds in 2018, Jimmy Freight, is also a TB with an Abercrombie line sire and a dam inbred to the Abercrombie line. The fastest 2 year old filly in the world, Warrawee Ubeaut, is also a TB to the Abercrombie/Adios line and the legendary Foiled Again is TB to the Meadow Skipper line. Marion Marauder is a Speedy Crown line out of a mare inbred to Speedy Crown as are a number of Muscle Hill's best including Resolve.

If you are a thoroughbred breeder you may take note of this pattern since many of the top thoroughbreds are TB pattern to either the Northern Dancer or Mr Prospector line, another reason for calling it the TB pattern.

After a twenty years of researching the pedigrees of the Standardbred horse from its earliest beginnings I am still not absolutely sure if there is any one secret formula to follow but at the same time there are clearly patterns and statistics relating to pedigree, as Marg Neal stated, that seem to repeat themselves given the right set of circumstances. The use of stallion profiles and the related stallion finder is the closest thing I have found as a process that is based on fact that will provide a basis for confident decisions regarding the breeding and purchase of standardbreds.

Over 90% of the top performers are outcrossed on sire line. i.e. the sire line of the sire and the sire line of the dam are different and 100% exhibit maternal inbreeding as described in one or more of the three matching scenarios. It is possible to state, based on the above, the following as a breeding guideline to improve the chances of success.

"Outcross on sire line and inbreed maternally"

STALLION FINDER WORKSHEETS AND CHARTS

The following worksheets and charts are used to evaluate broodmares and yearlings with respect to pedigree and performance criteria.

Worksheet A	Pacing Broodmare Evaluation
Worksheet B	Trotting Broodmare Evaluation
Worksheet C	Performance Rating of the Broodmare
Worksheet D	Pacing Yearling Evaluation
Worksheet E	Trotting Yearling Evaluation
Worksheet F	Performance Rating of the Yearling
Chart A	Speed Ratings
Chart B	Stallion Speed Ratings

Make copies of worksheets for multiple use.

Worksheet A - PACING BROODMARE EVALUATION

Name : _____

Sire : _____

Sire Line : _____

What are the principal sire lines of this mare?

Ad **GT** **MS** **Vo** **GA** **Other**

Check with X

1. Dam-Sire-Sire: _____ — — — — —

2. Dam-Sire-Dam-Sire : _____ — — — — —

3. 2nd Dam-Sire : _____ — — — — —

4. 3rd Dam-Sire : _____ — — — — —

Sire lines are **Ad** – Adios, **GT** – Good Time, **MS** – Meadow Skipper, **Vo** – Volomite, **GA** – Gene Abbe, Other

Broodmare Profile _____

Matching Scenarios

Key Sires

Scenario #1 One or more of lines 1-4 matched to the dam of the stallion _____

Scenario #2 Any two sire lines matched to the dam of the Stallions sire _____

Scenario #3 Any two sire lines after eliminating two sire lines that are the same _____

Speed Rating _____ Earnings Rating _____ Bonus Points _____ Performance Rating _____

To breed at National level Minimum Performance Rating is 80

To breed at major Regional level Minimum Performance Rating is 60

To breed at minor Regional level Minimum Performance Rating is 40

Stallion Choice 1. _____ 2. _____ 3. _____ 4. _____

Worksheet B - TROTTING BROODMARE EVALUATION

Name : _____

Sire : _____

Sire Line : _____

What are the principal sire lines of this mare ?

ST **SP** **VS** **AX** **Other**

Check with - X

1. Dam-Sire-Sire: _____

— — — — —

2. Dam-Sire-Dam-Sire : _____

— — — — —

3. 2nd Dam-Sire : _____

— — — — —

4. 3rd Dam-Sire : _____

— — — — —

Sire lines are **ST** – Stars Pride, **SP** – Speedster, **VS** – Victory Song, **AX** – Axworthy

Broodmare Profile _____

Matching Scenarios

Key Sires

Scenario #1 One or more of lines 1-4 matched to the dam of the stallion

Scenario #2 Any two sire lines matched to the dam of the Stallions sire.

Scenario #3 Any two sire lines after eliminating two sire lines that are the same

Speed Rating _____ Earnings Rating _____ Bonus Points _____ Performance Rating _____

To breed at National level Minimum Performance Rating is 60

To breed at major Regional level Minimum Performance Rating is 45

To breed at minor Regional level Minimum Performance Rating is 30

Stallion Choice 1. _____ 2. _____ 3. _____ 4. _____

Worksheet C - PERFORMANCE RATING OF THE BROODMARE (PR)

1. Mare Name : _____
2. What is the record of the mare ? _____ e.g. 3,1.59.3h Chart _____ SR _____
3. Best record of a full sibling ? _____ Chart _____ minus 10 points SR _____
4. Best record of a half sibling ? _____ Chart _____ minus 20 points SR _____
 Convert the records to a Speed Rating (SR) value using the Speed Rating Chart
 Subtract 10 points from the full sibling value and 20 Points from the half sibling value.
5. The SR of the mare (line 1) is the highest of the SR values on lines 2, 3 and 4 SR _____
6. How much did the mare earn ? _____ Adjusted _____
 Divide earnings by 10000 to adjust
7. How many foals has she had ? _____
8. Divide the mare's adjusted earnings by the number of foals to date plus one _____
9. How much did the highest earning foal earn ? _____ Adjusted _____
 Divide earnings by 10,000 to adjust
10. The 1st Dam Earnings Rating (ER) is the greater of line 8 or 9, max of 40 points 1st Dam ER _____
11. Earnings of 2nd dam's highest earning foal _____ Adjusted _____
 Divide earnings by 20,000 to adjust
12. The 2nd Dam ER is the adjusted earnings from line 11, maximum 25 points 2nd Dam ER _____
13. Earnings of 3rd dam's highest earning foal _____ Adjusted _____
 Divide earnings by 30,000 to adjust
14. The 3rd Dam ER is the adjusted earnings from line 13, maximum 10 points 3rd Dam ER _____
15. The unadjusted ER is the total of the ER values on lines 10, 12 and 14 Total ER _____
16. Adjust the ER for 7th foal or later by dividing foal number into six _____
 e.g. 8th foal = $6/8 = 0.75$ or $3/4$
- 17 Next foal adjustment is line 7 plus one. _____ X Line 16 _____ = Foal number adjusted ER _____
- 18 Performance Rating (PR) is the Speed Rating (line 5) plus the Earnings Rating (higher of lines 15 or 17) PR _____

The Performance Rating can be further adjusted for pedigree bonus points such as maternal doubles of key mares MP or HH

Worksheet D - PACING YEARLING EVALUATION

Pedigree

Name : _____

Sire : _____

Sire Line : _____

What are the principal sire lines of the Sire's dam ?

Ad **GT** **MS** **Vo** **GA** **Other**

Dam Sire: _____

— — — — — —

2nd Dam Sire _____

— — — — — —

What are the principal sire lines of this mare?

1. Dam-Sire-Sire: _____

— — — — — —

2. Dam-Sire-Dam-Sire : _____

— — — — — —

3. 2nd Dam-Sire : _____

— — — — — —

4. 3rd Dam-Sire : _____

— — — — — —

Sire lines are **Ad** – Adios, **GT** – Good Time, **MS** – Meadow Skipper, **Vo** – Volomite, **GA** – Gene Abbe

Pedigree Match : _____ e.g. Meadow Skipper line bred

Bonus Pedigree Features Outmatch Pedigree _____ Double to Helen Hanover _____ Double to Margaret Parrish (Filly only) Bonus Points _____

Matching Scenarios

Key Sires

Scenario #1 One or more of lines 1-4 matched to the dam of the stallion _____

Scenario #2 Any two sire lines matched to the dam of the Stallions sire _____

Scenario #3 Any two sire lines after eliminating two sire lines that are the same _____

Use values from Worksheet F to determine the following

Speed Rating _____ Earnings Rating _____ Bonus Points _____ Performance Rating _____

Worksheet E - TROTting Yearling Evaluation

Pedigree

Name : _____

Sire : _____ Sire Line : _____

What are the principal sire lines of the Sire's dam ? **ST** **SP** **VS** **AX** **Other**

Dam Sire: _____ — — — — —

2nd Dam Sire _____ — — — — —

What are the principal sire lines of the yearlings dam ?

1. Dam-Sire-Sire: _____ — — — — —

2. Dam-Sire-Dam-Sire : _____ — — — — —

3. 2nd Dam-Sire : _____ — — — — —

4. 3rd Dam-Sire : _____ — — — — —

Sire lines are **ST** – Stars Pride, **SP** – Speedster, **VS** – Victory Song, **AX** – Axworthy

Pedigree Match _____

Bonus Features Outmatch Pedigree _____ Double to Margaret Parrish _____ Double to Helen Hanover (Filly only) _____ Bonus Points _____

Matching Scenarios

Key Sires

Scenario #1 One or more of lines 1-4 matched to the dam of the stallion _____ _____

Scenario #2 Any two sire lines matched to the dam of the Stallions sire. _____ _____

Scenario #3 Any two sire lines after eliminating two sire lines that are the same _____ _____

Use values from Worksheet F to determine the following

Speed Rating _____ Earnings Rating _____ Bonus Points _____ Performance Rating _____

Worksheet F - PERFORMANCE RATING OF THE YEARLING (PR)

Yearling Name : _____ Sale: _____ Hip# _____

1. Dam Name : _____

2. Dam Speed Rating from Worksheet 3 _____ Dam SR _____

3. Dam Earnings Rating from Worksheet 3 _____ Dam ER _____

Bonus points may be added for special pedigree features as follows

4. Double to Margaret Parrish or Helen Hanover in Dam Add 10 points to Dam ER _____

5. Double to Margaret Parrish or Helen Hanover in Yearling (Filly only) Add 10 points to Dam ER _____

6. Final ER of the Dam is sum of lines 3, 4 and 5 _____ Final Dam ER _____

5. Sire Name : _____

Determine Speed Rating below

6. What is the record of the Sire ? _____ e.g. 3,1.59.3h Chart _____ SR _____

7. Best record of a full sibling ? _____ Chart _____ minus 10 points SR _____

8. Best record of a half sibling ? _____ Chart _____ minus 20 points SR _____

Convert the records to a Speed Rating (SR) value using the Speed Rating Chart

9. The SR of the Sire is the highest of lines 6, 7 or 8 or use Sire Chart _____ Sire SR _____

10. The Yearling Speed Rating is the sum of line 2 and line 9 divided by 2 _____ Yearling SR _____

Bonus pedigree points may be added for outmatch pedigree, DD pattern or TB pattern as follows

11. Bonus pedigree based for outmatch - 10pts, DD - 20pts, TB - 20pts _____ Total _____

12. Final SR of the Yearling is sum of line 10 and line 11 _____ Final Yearling SR _____

The Yearling Performance Rating is the SR from line 12 plus ER from line 6 _____ Final Yearling PR _____

You can convert the Speed Rating back to a time using the Speed Rating Chart e.g. if the Final SR is 54 then the 3 year old race time will be 1: 49.1 over a mile track. Combine with the Performance Rating e.g. 107 and list as 107 – 49.1 for comparison purposes. To adjust this rating for conformation use a scale of + or – 40 applied to the Performance Rating based on positive or negative attributes.

CHART A - SPEED RATING CHART

Record	Points	2YO	4YO	Aged	1/2	5/8	7/8	1 1/8	TT
2:00	0	10	-5	-10	25	15	5	-5	-5
1.59.4	1	10	-5	-10	25	15	5	-5	-5
1.59.3	2	10	-5	-10	25	15	5	-5	-5
1.59.2	3	10	-5	-10	25	15	5	-5	-5
1.59.1	4	10	-5	-10	25	15	5	-5	-5
1.59	5	10	-5	-10	25	15	5	-5	-5
1.58.4	6	10	-5	-10	25	15	5	-5	-5
1.58.3	7	10	-5	-10	25	15	5	-5	-5
1.58.2	8	10	-5	-10	25	15	5	-5	-5
1.58.1	9	10	-5	-10	25	15	5	-5	-5
1.58	10	10	-5	-10	25	15	5	-5	-5
1.57.4	11	10	-5	-10	25	15	5	-5	-5
1.57.3	12	10	-5	-10	25	15	5	-5	-5
1.57.2	13	10	-5	-10	25	15	5	-5	-5
1.57.1	14	10	-5	-10	25	15	5	-5	-5
1.57	15	10	-5	-10	25	15	5	-5	-5
1.56.4	16	10	-5	-10	25	15	5	-5	-5
1.56.3	17	10	-5	-10	25	15	5	-5	-5
1.56.2	18	10	-5	-10	25	15	5	-5	-5
1.56.1	19	10	-5	-10	25	15	5	-5	-5
1.56	20	10	-5	-10	25	15	5	-5	-5
1.55.4	21	10	-5	-10	25	15	5	-5	-5
1.55.3	22	10	-5	-10	25	15	5	-5	-5
1.55.2	23	10	-5	-10	25	15	5	-5	-5
1.55.1	24	10	-5	-10	25	15	5	-5	-5
1.55	25	10	-5	-10	25	15	5	-5	-5
1.54.4	26	10	-5	-10	25	15	5	-5	-5
1.54.3	27	10	-5	-10	25	15	5	-5	-5
1.54.2	28	10	-5	-10	25	15	5	-5	-5
1.54.1	29	10	-5	-10	25	15	5	-5	-5
1.54	30	10	-5	-10	25	15	5	-5	-5
1.53.4	31	10	-5	-10	25	15	5	-5	-5
1.53.3	32	10	-5	-10	25	15	5	-5	-5
1.53.2	33	10	-5	-10	25	15	5	-5	-5
1.53.1	34	10	-5	-10	25	15	5	-5	-5
1.53	35	10	-5	-10	25	15	5	-5	-5
1.52.4	36	10	-5	-10	25	15	5	-5	-5
1.52.3	37	10	-5	-10	25	15	5	-5	-5
1.52.2	38	10	-5	-10	25	15	5	-5	-5
1.52.1	39	10	-5	-10	25	15	5	-5	-5
1.52	40	10	-5	-10	25	15	5	-5	-5
1.51.4	41	10	-5	-10	25	15	5	-5	-5

1.51.3	42	10	-5	-10	25	15	5	-5	-5
1.51.2	43	10	-5	-10	25	15	5	-5	-5
1.51.1	44	10	-5	-10	25	15	5	-5	-5
1.51	45	10	-5	-10	25	15	5	-5	-5
1.50.4	46	10	-5	-10	25	15	5	-5	-5
1.50.3	47	10	-5	-10	25	15	5	-5	-5
1.50.2	48	10	-5	-10	25	15	5	-5	-5
1.50.1	49	10	-5	-10	25	15	5	-5	-5
1.50	50	10	-5	-10	25	15	5	-5	-5
1.49.4	51	10	-5	-10	25	15	5	-5	-5
1.49.3	52	10	-5	-10	25	15	5	-5	-5
1.49.2	53	10	-5	-10	25	15	5	-5	-5
1.49.1	54	10	-5	-10	25	15	5	-5	-5
1.49	55	10	-5	-10	25	15	5	-5	-5
1.48.4	56	10	-5	-10	25	15	5	-5	-5
1.48.3	57	10	-5	-10	25	15	5	-5	-5
1.48.2	58	10	-5	-10	25	15	5	-5	-5
1.48.1	59	10	-5	-10	25	15	5	-5	-5
1.48	60	10	-5	-10	25	15	5	-5	-5
1.47.4	61	10	-5	-10	25	15	5	-5	-5
1.47.3	62	10	-5	-10	25	15	5	-5	-5
1.47.2	63	10	-5	-10	25	15	5	-5	-5
1.47.1	64	10	-5	-10	25	15	5	-5	-5
1.47	65	10	-5	-10	25	15	5	-5	-5
1.46.4	66	10	-5	-10	25	15	5	-5	-5
1.46.3	67	10	-5	-10	25	15	5	-5	-5
1.46.2	68	10	-5	-10	25	15	5	-5	-5
1.46.1	69	10	5	-10	25	15	5	-5	-5
1.46.0	70	10	-5	-10	25	15	5	-5	-5
1.45.4	71	10	-5	-10	25	15	5	-5	-5
1.45.3	72	10	-5	-10	25	15	5	-5	-5
1.45.2	73	10	-5	-10	25	15	5	-5	-5
1.45.1	74	10	-5	-10	25	15	5	-5	-5
1.45.0	75	10	-5	-10	25	15	5	-5	-5

The speed rating chart allows you to normalize any record to three year old performance on a mile track. A single point represents 1/5 of a second. A record of 2,1:55.3f gives a Speed Rating of 47 based on 22 points for a speed of 1:55.3, an additional 10 points (2 seconds) for the record taken at two year old, and an additional 15 points (3 seconds) for the difference between a 5/8 track and a mile track. The maximum allowable speed rating is 75 points, equivalent to a record of 1:45 on a mile track. To assign a speed rating to a yearling calculate the Speed Rating for the mare and average it with the SR for the sire e.g. The mare has a Speed Rating of 38, the sire has a speed rating of 54, the average is $38+54 = 92/2 = 46$, equivalent to a three year old record on a mile track of 1:50.4

CHART B - STALLION SPEED RATINGS

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