Pedigree Analysis – Careless Secretary 1989 Thoroughbred

The purpose of this analysis to evaluate this stallion's genetic potential for both sport and race horse production. Every pedigree is unique, like a fingerprint, and if we know how to evaluate it we can look through its window into the essence of the horse. We will be using the 'Tesio Methods' to weigh his genetics, as they encompass several pedigree design elements that have been statistically proven to indicate dominance. In this process we will see that this stallion whose pedigree appears at first glance to just be in a typical Nasrullah sire line form, nevertheless it proves instead to be an extremely potent package. For your assistance in understanding this technique there is at the rear of this analysis an appendix: Evaluating Pedigrees, which will outline the basic principles and statistics in pedigree evaluation and potency building.

[Note: 'typical Nasrullah sire line form' refers to the commonly seen duplication of Nasrullah on both sire-lines through sons—as we see here. With very popular sires this is an often found design in their descendants as the breeders were trying to capture and preserve the superior talent resident in those super stars. For an example, there must be thousands of horses out there with a Northern Dancer sire line and also with him found on the dam side by a son. The problem with this type of structure is that the sex-linked material (which travels on the X chromosome) which contains factors that help a horse in performance and reproduction, do not come through to the offspring. A stallion only transfers his X chromosome to his daughters; therefore a son does not get those sex-linked elements that helped make his sire so great. In geldings this is not so critical and there is many a high performance sport gelding out there with this type of design, but it is not helpful for a stallion or a mare. The importance of this sex-balancing has been statistically proven (Tesio Methods)—see the appendix for more.]

Normally it is far better to have dominance present in both a male and female form. You will see that Careless is 3x4 to Nasrullah by sons only, and could easily assume then that this is a very male leaning pedigree, which is usually okay for performance, especially in male horses, but is notably less helpful in breeding stock, that is in both male and female. But things are not always as they first appear, and once I began examining his entire pedigree structure I discovered that Careless has a most interesting pedigree construction, in that virtually every strong element is sex-balanced, including the powerful Nasrullah presence.

Nasrullah is here by two of his best sons Grey Sovereign and Secretariat—you can't do much better than those two as they are very high class lines. But what makes this better is the remarkable level of reinforcement and complexity which is joined to this presence of Nasrullah. Let me explain this so you can see it in the pedigree. Nasrullah's dam is Mumtaz Begum, a very moderate racehorse but fantastic broodmare. If you look at the bottom line of the pedigree you will see Mah Iran, who is a genetic ¾ sister to Mumtaz Begum—full and ¾ siblings are proven dominance builders--and Mumtaz Mahal is here through a daughter: Mah Bedar, which in turn then makes her daughter a sister to Nasrullah, and being on the dam-line it is her mtDNA that is providing the respiratory efficiency and heart strength. Both these sisters are out of Mumtaz Mahal by a Blandford son and therefore ¾ sisters: Mah Iran is by Bahram, but Mumtaz Begum is by Blenheim, and we find that there is a Blenheim son present elsewhere in this lineage to balance this influence as well: Donatello II. The presence of this mare Mah Iran and the sex-balancing she provides is enough to elevate this stallion's genetic power from ordinary into very good.

But that is not all. The second sire of Nasrullah is Pharos, and we find his full brother Fairway in the 6th generation through a daughter, Queen of the Meadows, once again providing a sex-balance of this powerful line. Queen of the Meadows is a ½ sister to Nearco. Even Nogara, the dam of Nearco, finds genetic reinforcement, as her brother Cavaliere D'Arpino is here as well. The third sire, Phalaris, is balanced by a presence of his ½ sister Polyflora. This is really quite extraordinary, the depth and complexity of the strengthening is everywhere we look, and this makes the Nasrullah influence far stronger than its position 3x4—it is an over-riding dominance. It is almost as if the entire lineage was purposely structured to reinforce and empower the Nasrullah—Careless Secretary provides a concentrated dose of the full power of Nasrullah into his offspring—this is no small thing.

Let's examine then what it means to be a Nasrullah genetic bomb, as that is what Careless Secretary is! (Following are some excerpts from my article on Nasrullah found in *North American Sport Horse Breeder* 2013).

> "Nasrullah is a genetic giant in sport horse breeding. Everywhere there is excellence in Olympic style sport his bloodline shows up in a big way. However, this Thoroughbred racehorse presents a challenge to some of the traditional beliefs held in the sport horse breeding psyche. Nasrullah has 3 strikes against him- first, he is a Thoroughbred, next, he is rated a sprinter sire and last, he had an extremely bad attitude and he passed it on. So then, how can a sprinting Thoroughbred sire with serious temperament issues become one of the most valuable sport horse bloodlines of the last 50 years?

[Nasrullah – the greatest sport horse sire-line in modern times—photo by Skeet Meadors.]

> "Nasrullah, with his chaotic nature- fiery and obstinate, who seemed in perpetual war with himself and everyone else, is surely a reflection of the era he was born into. Bred by the Aga Khan at his Irish stud, he was born in 1940 during World War II. He is a remarkable horse in many ways. His talent is immense, he clearly possessed the highest racing quality, but he also displayed a wild and unruly disposition that interfered with his racing performance, ultimately causing him to lose half of his races; most experts believed he would otherwise have easily won them all. And that was just it, when he was in the mood he easily could outrun the others.
>
> "His sire Nearco also was a difficult horse, however, Nearco's disposition did not affect his racing performance as he possessed a tremendous will to win, and win he did – retiring undefeated. The descendants of Nearco often get not only large doses of his talent, but many of the Nearcos are self-willed and high strung as well. This is not that uncommon in great sires as we see St. Simon, Tourbillon, Ksar, Hastings, Fair Play are a few others who had huge amounts of sport ability along with irascible dispositions, and like Nearco they passed it down quite frequently…Nasrullah however, was one of the worst- he couldn't be forced, he was hard to control and on occasion savage…"

Luckily the Nasrullah disposition became modified through the generations, for instance Secretariat was a real sweetheart and he had a great work ethic, his sire Bold Ruler also had a wonderful disposition, and Careless appears to have gotten none of Nasrullah's nastiness.

Nasrullah was a pure sprinter—he is rated a *chef-de-race* in the sprint category, and he generally sired sprinters and milers. According the sport horse industry wisdom we have all been indoctrinated with, only stamina-bred thoroughbreds are suitable for sport horse breeding. Addressing this issue I continued:

> "The truth of the matter is that **both** types are needed in sport as well as in racing. Too much stamina and you get a horse with no 'go' and too much sprint and the horse runs out of steam quickly. Like the racehorse breeders, we in the sport horse arena have to find the right combination to succeed. Extremes don't make the grade unless they are tempered with some different strains.
>
> "Yet with all this going against him being a sport horse sire of value, this temperamental Thoroughbred sprinter line, has a consistent record of success for 30+ years in sport horse production. Peter Birdsall places him #1 as the most significant sireline in hunters and jumpers- from the 1980s until now.

Dr. Birdsall said:

> "When all four disciplines are grouped together, the frequency of occurrence of the leading sire lines is as follows: Nasrullah, Man O'War, Princequillo, Native Dancer. The order and distribution of these sire lines is probably not surprising for anyone familiar with sport horse bloodlines… it is notable that the distribution of the sire lines in pedigrees of leading sport horses is almost identical even today." (Birdsall)

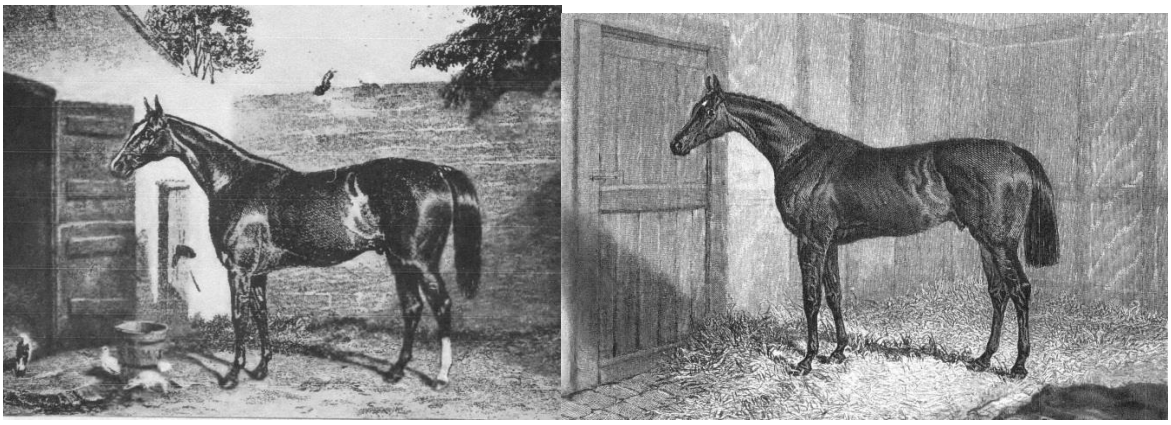
This puzzling horse with a record and a pedigree so inexplicable by our common knowledge turned out to be the best sire in all Olympic style disciplines:

> "Nasrullah led the rankings in **all four** disciplines: hunter, jumper, eventing and even dressage. As breeders we want to understand why Nasrullah is so powerful.

Since I have written the book that this excerpt is from I have researched and written another book (*Legacy of Lexington* 2015), which is focused exclusively on the American Thoroughbred and its impact in all sport, and I have learned some interesting facts. Some of them apply here.

In following pedigrees back through time, and evaluating the lineages of our Hall of Fame inductees, I found that there are some bloodlines that are usually behind the top show jumpers in multiples—no matter the country of origin, these root sources are the Irish Thoroughbred full brothers Birdcatcher/Faugh-a-Ballah, the English TB mare Clemence and the American Running Horse Lexington. Most of the 'jumper lines' you read about online or in sport horse literature owe their jump talent to these lines. Now, because Birdcatcher is the 2nd sire of Stockwell and Rataplan, full brothers out of Pocahontas--they are therefore the backbone of the English TB—so we are all going to have multiple lines of him—maybe that is one reason why most TBs possess a good jump. I have found that when a line or two of his full brother Faugh-a-Ballah is present as well that the release of jumping talent is immense. For instance, one of the American Show Jumper Hall of

Famers, Democrat, who is a full TB and an Army Remount-bred gelding, was a world class jumper, and his greatest dominance is these full brothers in the background, focused to the front by three lines of Martagon. Here is another: the great show jumper line of Marco, which is heralded in warmblood circles, receives its jump also from Birdcatcher.



[Birdcatcher on the left, his full brother Faugh-a-Ballah on right—etchings by Henry Hall]

The sport power that emanates from the English mare Clemence has been hidden from our view until recently because of a fraud entered in the General Stud Book. It is only through the recent DNA revelations of Drs. Hill and Bower, that it was discovered the icon Bend Or was really another horse named Tadcaster. This was in 2010 and 2012, and the shock waves resulting from this exposé are still hitting pretty hard. The faker Bend Or is sire of Bona Vista and many other horses of note, but his sire and racing record really are those of Tadcaster—a ringer. Bend Or was by Doncaster out of Rouge Rose. The difference is Clemence, and what a difference it makes! Full siblings are the single strongest design we can make in our pedigrees for dominance, and this placement 3x3 is immensely powerful, and it explains the enormous footprint this stallion has left. For instance, Tesio's program went through the roof when he combined St. Simon with his full sister Angelina in his lineages. (Remember this when you are designing your own matings.)

It was while rewriting my pedigrees and inserting Tadcaster in place of the ever present Bend Or that I discovered that the premier sport lines of Fair Play and The Tetrarch were affected by this sham, and these two lines are some of the strongest jump transmitters in the world (although they are not celebrated in traditional warmblood literature as such). The Tetrarch was always an enigma: how could a horse with poor front legs and low fertility father a sport dynasty? But now it is apparent, with the pedigree corrections, because The Tetrarch is revealed to be 3x3 to the full siblings Tadcaster and Clementina—both by Doncaster out of Clemence.

The Tetrarch is powered by the full sibling configuration—that is his genetic power. Now the American line of Fair Play—a tremendous jump source (sire of Man O'War and other greats), is one that always has crossed well with The Tetrarch, and now we can see why, as Fair Play is out of a Clemence daughter: Fairy Gold. The lines in the The Tetrarch are both by sons, when combined

with Fair Play they become sex-balanced. Further, the great Australian sire Carbine, the sire of Spearmint (also a sire with poor front legs that became a great sport line) is out of The Mersey, who is out of Clemence (no Doncaster this time). Spearmint, the sire of Catnip, contributes his jump traits to Nearco and his descendants. If three of the greatest sport lines in the world: Fair Play, The Tetrarch and Carbine are descended from this mare we can now recognize her asone of the greatest sport broodmares of all time.

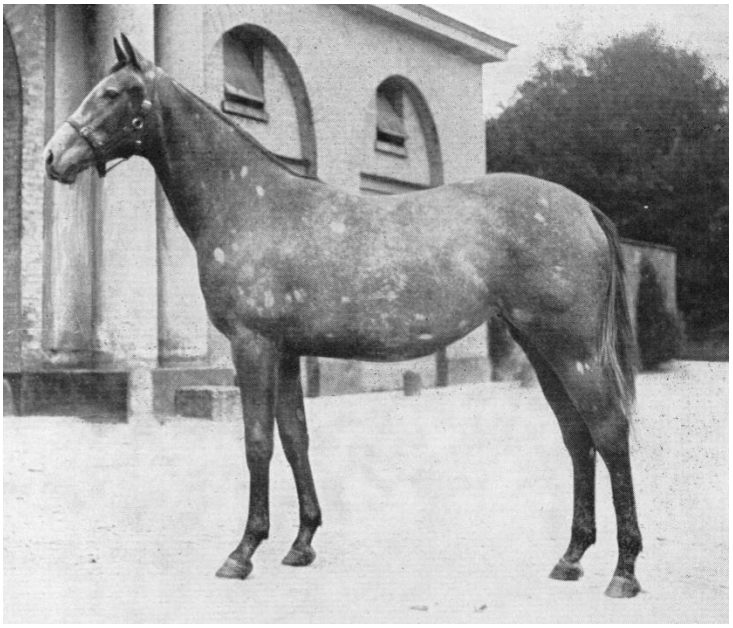
The sport talent radiating from other lines that could not be explained are becoming clear also, such as the line of French Thoroughbred Teddy, who is found in sport horses everywhere of every type. Analysts over the years have struggled to explain his continuous presence in the top sport horses, but they could not come up with a satisfying reason. But now with the pedigree corrections in place we find he is loaded with Birdcatcher and Clemence as well.

You, and other sport horse breeders in Europe, will be less familiar with our American sources. However, it would be to your advantage to get up to speed on them because since the 1970s the American TB has been imported into England/Ireland and greater Europe in vast numbers, and they are now dominating the European racer—a lot of this influx of American stock came through the Coolmore Stud in Ireland—for example Sadlers Wells, Never Bend and his son Mill Reef are now dominant Thoroughbred lines and they are all American-bred.

Lexington RH is an American line that is on at par with St. Simon in the English breed—he is everywhere in all our American sport breeds, not just the TB. He was a fantastic four-mile heat racer, setting world records, and he personally has the greatest sire record in the world—sixteen years as top sire—never has this record been bested, and he was born in 1850. A horse that can run four-mile heats—which usually go for 2 to 3 heats (8 to 16 miles) and can establish a dynasty during the American Civil War when most of his stock was lost in the carnage (cavalry war), is surely a contender for the greatest stallion ever. He is also a top sport line, found continuously in the background in multiples of top jumpers, eventers and even dressage horses. He is found concentrated (inbred) in Domino, Lady Josephine, Tourbillon, and others. I have put RH (Running Horse) after Lexington's name to identify that he was from our Running Horse breed, the American TB did not become a separate breed until 1868 when the pedigree requirements of 5 generations of strictly English blood along with the performance standard of the classic distance race were fulfilled. Lexington RH—born in 1850--would not have qualified as he had dam-lines that went back to the American and English Running Horse mares. (Indeed, later on when our racehorse came to England in the mid and late 1800s and started taking the classics in such a devastating fashion that the British finally responded by banning American bloodlines on the basis of their 'impurity' (Lexington RH was their prime target). This action was called the Jersey Act, and it was in force from 1913 to 1949—which is why you see so few American bloodlines in Europe until the last half of the 20th century—the American TB was banned from the studbook and any country that bred TBs and used our bloodlines could not register their stock either).

[The American Running Horse Lexington, he is still powering the top sport performers today 165 years after his birth—etching from a painting by Troye.]

[Note: the American Thoroughbred is different from every other Thoroughbred population as it descends from the English Thoroughbred *and* the Running Horse—all other populations are strictly of English Thoroughbred descent. The Running Horse was the pre-TB breed of racehorse in the British Isles (in Ireland it was called the Hobby) and the American colonies imported large numbers of these racers for breeding—before there was a 'Thoroughbred' breed. The recent DNA studies have revealed that the 'speed gene' came from those original native race-mares, not the 'oriental' imports. This does a lot to explain why the American TB is the fastest, and also why the other American developed race horse breeds of Quarter Horse and Standardbred are the fastest race breeds in their categories as well—it was those little pre-TB horses that carried the speed.]



[Mumtaz Mahal, called the Flying Filly, was an incredibly fast sprinter, but for us, the sport horse breeders, she gives other gifts as well. She is a warehouse for the top root sport lines of Birdcatcher, Clemence and Lexington RH-from a photo found in the TB Record].

In the future, when people take their blinders off and really begin to look from where sport talent comes and who carries the concentrated doses of it, it will be then that the mare Mumtaz Mahal will become celebrated not just for her speed (*reine-de-course)*, but for her tremendous overall athletic gifts. She is behind the sport horse lines of Nasrullah, Royal Charger, Badruddin, Furrokh, Mizra II and Mah Iran. Her daughter Mumtaz Begum is the dam of Nasrullah. Mumtaz Mahal is by The Tetrarch out of Lady Josephine, a mare who carries inbreeding to the full siblings Norfolk RH and The Nun RH—full siblings by Lexington RH. Therefore, because Mumtaz Mahal is by The Tetrarch out of Lady

Josphine, then she carries full sibling inbreeding of both Clemence and Lexington RH—this is power. It is significant that Mumtaz Begum's best offspring were the result of breeding with Nearco—such as Nasrullah. Nearco has an American dam-line which travels back to Maiden, a Lexington RH daughter, plus he has 3 lines of Clemence and 11 of Birdcatcher and 3 of his full brother Faugh-a-Ballah.

Now, how does all this apply to the sport talent found in the genetics of Careless Secretary? Talent doesn't drop from the sky, and Nasrullah didn't earn his status as top modern sport line because he was cute, it was because he carries the genetic goods and he is able to pass them on. Just through his dam-lines: Nogara and Mumtaz Mahal, he carries fourteen more lines of Birdcatcher, three of Lexington RH and three of Clemence RH, and when you add to those the lines in Nearco, you find he is over-run with the top sport sources. These bloodlines are the root source of true sport talent in our sport horses of all types. And Careless Secretary, with his inbred and sex-balanced lines is a laser beam of those Nasrullah genetics.

[Note: there are other root bloodlines that provide a jump, a famous one is Le Sancy and his genetic power is from inbreeding to the full siblings Thormanby and Lady Hawthorn 2x3. Another is the Dollar line in France, who is a son of The Flying Dutchman—it is interesting that both of these French lines have a build-up of the Alexander Mare.]

Statisically it was found that the stallions do much better when they possess a pedigree design that contains a 'filly factor' or two. The great sport line of Spearmint is often found through his daughters only, therefore a filly factor design and Careless has him in his lineage through his daughters Catnip and Plucky Liege. But Careless also carries another powerful filly factor in Papyrus daughters: Cosquillo (found in Princequillo) and the rarely seen Talma in Nuccio—a Tesio product. All these factors point to Careless being an excellent sire.

Getting back to our original question: is Careless Secretary a good source for racing and Olympic style sport? The answer is a resounding YES—if you value the contribution of Nasrullah, then here today in Careless Secretary is a potent source of that same talent.

Understanding Pedigrees

[adapted from Appendix B in *Legacy of Lexington*]

- **Importance of Accuracy**

The pedigree is the map of the genetics. It becomes a powerful tool for our use in understanding dominance and in the designing of our breeding **if it is accurate**, and secondly, if we know **how to read it** (interpret).

Accuracy in pedigrees is not guaranteed. Over the years many mistakes were made in building out lineages, plus illustrious ancestors were invented by owners and breeders to advance their horses with motives to help sell them, to qualify for stud book requirements or to elevate their stud fees. Therefore, we must do our best to verify our pedigrees. It is only a powerful tool when it is accurate—a road map of the genetics—but all that positive potential is lost if the lineage is false.

The most comprehensive way to evaluate the pedigree is found in what is called "**Tesio Methods'**, especially when we combine it with the latest scientific findings. A step by step instruction on how to use these methods is presented in *North American Sport Horse Breeder* in Section II, so I will not go into great detail here, but will provide a simple outline on its main points for your reference use for this report.

- **Definitions:**

Inbreeding: common ancestors three generations or closer (1x3, 2x2, 3x6 etc.)

Linebreeding: common ancestors in the fourth through tenth generation (5x4, 6x6, 5x9 etc.)

Outcrossing: no common ancestors in six generations

Crossbreeding: sire and dam from different breeds (Saddlebred/Holstein, Thoroughbred/Morgan, Standardbred/Dutch)

Standard Pattern: a combination of ancestors that are seen more often than not in a breed---such as Mansfield and Ulysses in the Morgan, Ali and Falb in the Holstein, Web/Whalebone/Whisker in the Thoroughbred etc.

Nick: a combination of ancestors that has proven to produce exceptional offspring, examples—Fair Play/Rock Sand, Lexington RH/Glencoe.

Engine room: title given for the important pedigree position of the 4th through 6th generation, which scholars have identified as the key place for refocusing background strengths (balanced line-breeding).

Filly factor: a combination of offspring patterns that have proven to produce the best fillies and mares—these can either be sons and daughter lines of a key mare and/or daughters of a key sire (no sons). All breeding stock, both stallions and mares benefit for a strong filly factor or two as well as strong colt factors.

Colt factor: these can both sons and daughters of a key sire, and/or sons of a key mare (no daughters), and they are a notable factor in performance. While the best performance colts and geldings can get by with just colt factors, the best performance mares also need a filly factor as well.

Sex-linked material: large heart gene, speed gene, respiratory efficiency are some of the traits that travel on the X-chromosome—therefore on the dam-lines. Sex–linked traits travel from a sire to his daughters only and from a mare to both sons and daughters.

Mitochondrial DNA (mtDNA) – the DNA material supplied only by the dam which has been determined to contain the respiratory efficiency and energy conversion matter, plus some genetic material related to heart function and fertility. Because energy conversion is so vital for a sport performer, the quality of the mtDNA is an important factor in successful sport horses. The geneticist Ann Bowling referred to it as the 'metabolic power station'.

Phenotype: the appearance and performance of a horse, it does not necessary represent the whole genetic package carried.

Genotype: the full genetic fabric of the horse.

'critical mass' : term given the point when the genetic concentration of superior traits becomes so great that first class horses are regularly produced—in our jump pedigrees we want to achieve critical mass in Birdcatcher/Faugh-a-Ballah, Lexington RH and Clemence—with a closer refocus point in the engine room.

- **Helpful Genetic Facts:**

Genes travel intact down through the generations (unless a mutation occurs), that is why if you build up a background ancestor (and its close relatives) eventually you will see the type strongly in the foals, even if it is far back in the lineage.

Phenotype usually represents a fraction of DNA material found in a horse, that is why there is sometimes a sire or mare with no racing ability or poor conformation which may be produce offspring that far exceed it, or convexly, a stallion who is a great performer may not be able to reproduce his talent or type in his offspring because he is not potent in the traits he himself displays.

For a talent to be manifest in the horse it must be first of all be present in the pedigree, therefore if you find a horse that consistently produces offspring that do not reflect its ancestry it is a clue that the pedigree is wrong.

Inbreeding concentrates whatever is in the pedigree—good as well as bad, and inbreeding can cause recessive genes to appear that were hidden. Inbreeding of itself does not create negative traits—it just makes those present be more prevalent in the foal. Conversely it does not create positive factors; it just makes them more certain in the foal as well. Inbreeding is the quickest way to set 'type'.

Genes travel in clusters, so targeting a carrier of a specific trait for duplication can bring down with that trait other factors, if the target ancestor was a superior horse than this is a very positive thing. Creating full sibling configurations increases this even more which is why it is one of the strongest designs in pedigree potency.

Performance is the ultimate proof of our breeding designs, however proficiency at a sport at **any level** is a strong indicator of superior genotype, and conversely poor performance in sport at any level is an indicator of mediocre genotype.

- **Pedigree Structure**

In order to read a pedigree we need to understand its structure. We will use the pedigree of the great stallion Hamburg to demonstrate pedigree design. The placement position of the horses is a standard practice, that is, all equine pedigrees are constructed this way, and so this is a universal design.

Here is a 3-generation sample pedigree of Hamburg to illustrate the standard pedigree structure:

His sire is Hanover—the sire is always in this position (top of pedigree). His dam is Lady Reel—the dam is always in this position (bottom of pedigree). Therefore sire on top/dam on bottom. When you read about the tail-male line what they are speaking of is seen here in Hanover/Hindoo/Virgil RH and beyond. Just being on the male side of the pedigree is not included in tail-male, so Bonnie Scotland, the sire of the sire's dam is not included in the tail-male line. The 'RH' breed designation appears on all racehorses up to and including the year 1868—which was the year the American Thoroughbred was established—the American Thoroughbred did not exist as a breed until then—it required adopting the classic race length standard along with specific pedigree requirements, which at that time was five generations of English blood to become a "Thoroughbred", which was a breed originated in England not here. Naturally not all of our wonderful Running Horses qualified, nor did they want to, as it was a very successful breed of its own in all racing forms and disciplines.

Virgil RH

Hindoo

Florence

Hanover

Bonnie Scotland

Bourbon Belle

Ella D RH

Hamburg

Australian

Fellowcraft

Aerolite RH

Lady Reel

Enquirer RH

Mannie Gray

Lizzie G RH

When you read about tail-female lines, this would be represented here as Lady Reel/Mannie Gray/Lizzie G RH and so on—it does not include Aerolite RH the dam of the 1st dam's sire.

Sex-linked characteristics travel only on the X-chromosome pathways. In Hamburg because he is a stallion, this would be demonstrated as the tail-female line outlined above, plus from Aerolite RH to Fellowcraft to Lady Reel—so Aerolite RH contributes one of the X-chromosomes. This is because each mare has two X-chromosomes, and she would give one of her two to Hamburg. At this stage of scientific study there is not a way to determine which of the two X-chromosomes he would get. Although this may be a mystery that is solved in our lifetimes, as there is work going on about the X-chromosome, for instance, one theory is that one of them gets 'turned off' and so only one is manifest—but this is only a theory at this time.

Now if Hamburg was a mare, she would receive one X-chromosome from her dam—like he does, but she would also get another X-chromosome from his sire. This is why full brothers and sisters always are a little different genetically and is one of the reasons that the design of a full brother and sister in a pedigree is so effective, for it provides the entire genetic fabric of the target ancestor—all the sex-linked material as well as the basic DNA. So in this case if Hamburg was a mare he would get one of Bourbon Belle's two X-chromosomes, from either Bonnie Scotland's dam or from Ella D RH; and once again we cannot determine at this time which one of them would come down to her.

Being a stallion, Hamburg would get the Y-chromosome from his tail-male sire-line—from Hanover. So far in the research it appears that not much more than the sex determination travels on this gene, but perhaps new discoveries will be made on this as well.

Mitochondrial DNA (mtDNA) only travels on the tail-female line to both sons and daughters; therefore it is always supplied by the mother—in this case to Lady Reel from Mannie Gray, not from Aerolite RH. The mtDNA has been identified as controlling energy conversion in the cells, and has much to do also with respiratory efficiency, these are important factors in any athlete, and so the consideration of the quality of the dam-line and the buildup of our broodmare's is always a key factor in our success as sport horse breeders. In this case, Mannie Gray is about as good as it ever gets as she is dam of Domino et al—the fastest line, therefore the energy conversion factors she possesses and transfers are top rate.

With learning these principles we can make better decisions based on placement of certain ancestors in certain positions in our pedigree designs. With knowledge of the basic pedigree design we can then apply what we call Tesio Methods in both the evaluation of our proposed breeding stock, and the in the design of its breedings.

[Note: when the breeding of a horse is given in text it is in a traditional form also. In this case the writer would say Hamburg is <u>by</u> Hanover, and <u>out of</u> Lady Reel.]

- **Tesio Methods**

A group of scholars, historians and scientists have put their minds and techniques to work in determining what practices are the most productive in designed equine matings. They began this quest by evaluating the pedigrees of the master breeder Federico Tesio, ergo 'Tesio Methods', and over the years they have tested and added to the findings. These are methods are very useful for us as they enable us to read our pedigrees quickly to find the genetic power in them. And once we have become proficient in these techniques, it will allow us to not only recognize dominance and identify the important ancestors for our goals, but it will empower us to also design matings which increase dominance in those desired ancestors and their sport traits, therefore improve our sport horse product. The scientist Clive Harper approached this task from the scientist's viewpoint and he developed statistics that show which pedigree patterns have proven most effective in the production of top performance and breeding stock. Because of the complexity in genetics these 'ideal pedigree patterns' are best used as guides in our mating decisions, most pedigrees combine several of these factors in the design—none of them can be assumed to guarantee a successful outcome, but they are important to us because they have a higher percentage of success than standard practices. Further, with the continuous discoveries coming to us from the field of genetics we can add to these practices and surely come to understand why they are so effective.

Simplified steps for using the Tesio Methods:

1. **build out** your pedigrees multiple generations, verifying the ancestry as best you can.

2. **establish** a breeding goal or direction, so you can identify the ancestors you want to build on.

3. **research** the ancestors that represent the factors you want in your herd

4. **target** an ancestor, and find mates that will build on or concentrate it presence

Pedigree Design Components and practices that increase potency and dominance (statistically proven—Harper—*Thoroughbred Breeders Handbook*):

*Multiple lines of an ancestor—this is simplistic, the more related ancestors you have in a pedigree, the closer the horse will be to that horse in type.

*Sex-balance in the bloodlines has proven to be of the utmost importance in bringing the full benefits of the target ancestor down to the foal. So you would want a son and daughter line of an important ancestor or a full or ¾ sister to a sire, or a ¾ brother through a daughter line. Just repeating son lines of a sire begins to deaden the genetic transmission.

*Close Siblings: full and ¾ siblings, brothers and sisters, or sisters, or brothers, has proven to be the strongest potency builder—the design of full brother and sister being the very best of this design.

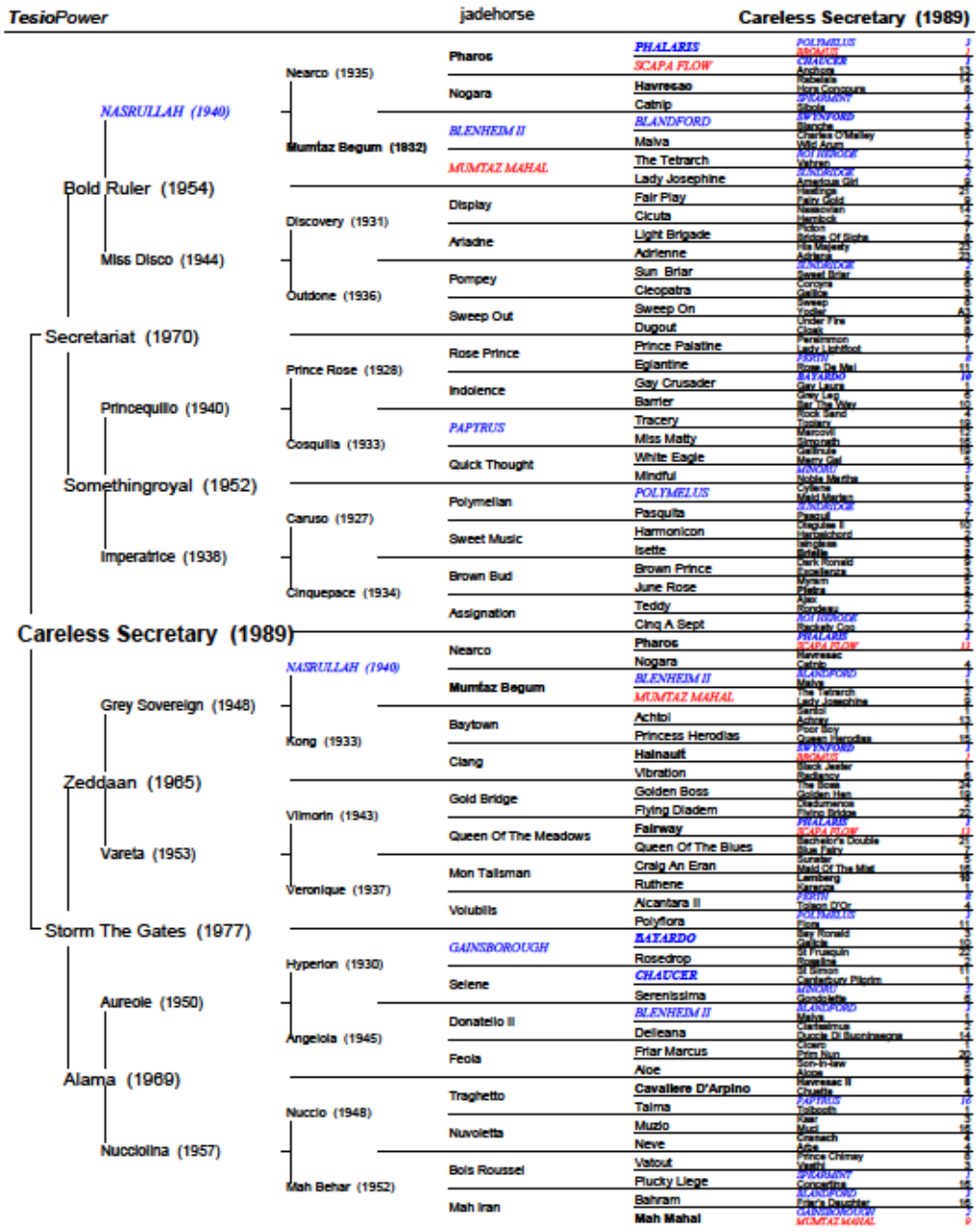
*Complexity in the lines: when targeting an ancestor, it has been demonstrated that to have variation in its expression increases the power. For instance, combining Man O' War with his ¾

genetic brother Friar Rock or Nasrullah with his 7/8 genetic brother Royal Charger are proven power combinations, equaling or exceeding the power of just having multiple lines of the same horses.

*Repeat the breeding: once you have designed a mating that is very genetically promising it is better to repeat it at least once. Full siblings vary in their expression of the genes and there are many cases of one sibling being a super star in performance and his full sibling is a dud. This can happen through the way genes divide before they combine, so a full sibling may have gotten the 'wrong' half of the gene for the trait you want.

* Performance vs. Stud: The pedigrees of successful performance horses can be different from great producers—often we find a 'male leaning' pedigree in top performance, which is a horse with minimal sex-balance in the lines, or a loosely bred lineage; however these are designs that have been shown to limit their career as a producer.

The above is a bare-bones outline of Tesio Methods and how to use them. For a step by step explanation with plentiful examples and instruction I refer you to my book: *North American Sport Horse Breeder,* the entire Section II is on these practices, and Section III is expanded discussions on the performance and breeding value of thirty-five real life examples.


TesioPower
jadehorse
Careless Secretary (1989)
Bold Ruler (1954)
Secretariat (1970)
Careless Secretary (1989)
Zeddaan (1965)
Storm The Gates (1977)
Alama (1969)
NASRULLAH (1940)
Miss Disco (1944)
Princequillo (1940)
Somethingroyal (1952)
Imperatrice (1938)
Grey Sovereign (1948)
Vareta (1953)
Aureole (1950)
Nuccioina (1957)
Nearco (1935)
Mumtaz Begum (1932)
Discovery (1931)
Outdone (1936)
Prince Rose (1928)
Cosquilla (1933)
Caruso (1927)
Cinquepace (1934)
NASRULLAH (1940)
Mumtaz Begum
Kong (1933)
Vimorin (1943)
Veronique (1937)
Hyperion (1930)
Angeiola (1945)
Nuccio (1948)
Mah Behar (1952)
Pharos
Nogara
BLENHEIM II
MUMTAZ MAHAL
Display
Ariadne
Pompey
Sweep Out
Rose Prince
Indolence
PAPYRUS
Quick Thought
Polymelian
Sweet Music
Brown Bud
Assignation
Nearco
Mumtaz Begum
Baytown
Clang
Gold Bridge
Queen Of The Meadows
Mon Talisman
Volubilis
GAINSBOROUGH
Selene
Donatello II
Feola
Traghetto
Nuvoletta
Bois Roussel
Mah Iran
PHALARIS
SCAPA FLOW
Havresac
Catnip
BLANDFORD
Malva
The Tetrarch
Lady Josephine
Fair Play
Cicuta
Light Brigade
Adrienne
Sun Briar
Cleopatra
Sweep On
Dugout
Prince Palatine
Eglantine
Gay Crusader
Barrier
Tracery
Miss Matty
White Eagle
Mindful
POLYMELUS
Pasquita
Harmonicon
Isette
Brown Prince
June Rose
Teddy
Cinq A Sept
Pharos
Nogara
BLENHEIM II
MUMTAZ MAHAL
Achtoi
Princess Herodias
Hainault
Vibration
Golden Boss
Flying Diadem
Fairway
Queen Of The Blues
Craig An Eran
Ruthene
Alcantara II
Polyflora
BAYARDO
Rosedrop
CHAUCER
Serenissima
BLENHEIM II
Delleana
Friar Marcus
Aloe
Cavaliere D'Arpino
Talma
Muzio
Neve
Valout
Plucky Liege
Bahram
Mah Mahal
POLYMELUS
SCAPA FLOW
Havresac
Catnip
BLANDFORD
Malva
The Tetrarch
Lady Josephine
Sardar
Achtoi
Poor Boy
Queen Herodias
BAYARDO
Black Jester
Radiancy
The Boss
Golden Hen
Diadumenos
Flying Bridge
SCAPA FLOW
Bachelor's Double
Blue Fairy
Maid Of The Mist
Lemberg
Kerasya
Tolson D'Or
POLYMELUS
Flora
Gay Ronald
Galicia
St Frusquin
Rosaline
St Simon
Canterbury Pilgrim
MINOU
Gondolette
BLENHEIM II
Malva
Clarissimus
Duccia Di Buonlresgna
Clouro
Prim Nun
Son-In-Law
Aloe
Havresac II
Chuette
PAPYRUS
Tollooth
Kier
Muci
Cranach
Adra
Prince Chimay
Vashti
SPEARMINT
Concertina
BLANDFORD
Fairy Daughter
GAINSBOROUGH
MUMTAZ MAHAL