SPORTS: IS IT ALL B.S.?

Why is it that, despite having more athletes, more coaches and more money involved in sports than any other country in the world, so many collegiate, national and international US organizations fall short in developing the best teams and have to go all over the world looking for the best players?

Believe it or not, no one is a naturally born athlete. Everyone must train to jump higher, take seconds off running times, throw a ball harder, or kick or hit farther.

The belief that great athletes are born or are naturals is b.s. If it were true, why would they have to spend thousands of hours practicing and playing a sport in order to become great? Everyone can improve their performance. It just takes know-how and a little bit of science. With so much b.s. floating around, it is often easier to believe myths rather than facts. This book explores many of the ways that coaches and athletes can cut through the b.s. to achieve better results on and off the field and truly develop athletic potential.

For example:

B.S.: Youngsters should not throw a curveball.

Fact: There is no consensus among coaches as to what constitutes a curveball.
Fact: The curveball technique is described in many different ways but rarely in a correct and safe manner.
Fact: What coaches say about the curveball is never backed up by organic photos or videos of high-level pitchers throwing this pitch.

B.S.: How fast you run is determined at birth.

Fact: Most athletes do not even come close to their genetic potential.
Fact: Most athletes, especially in football, baseball and basketball, run with poor technique and have poorly developed physical qualities specific to running.
Fact: Your training determines your speed.

B.S.: You must stretch before running or playing.

Fact: Static stretches done before participating worsen your ability to perform.
Fact: You need active stretches that have a high correlation to sports skills.

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Dr. Yessis Blows the Whistle on Player Development

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Is It All B.S.?
Exploring the Bull of Player Development

Bull. Bullshit. B.S. A load of crap. Whatever you want to call it, our society is full of it. In his academic book, On Bullshit, Harry G. Frankfurt wrote, "One of the most salient features of our culture is that there is so much bull." Unfortunately, the world of sports is no different. The main objective in writing this book is to expose the prevalent bull surrounding player development in the major sports.

Bull accurately describes much of the terminology and news that we get from coaches, athletes, sports writers and commentators. Very often they say things they may believe to be true but are false. The key difference is that they have no concern for what the truth really is. What they say are not actual lies, but very often a purposeful use of certain terms and sayings to connote a particular meaning that is inaccurate. Instead of addressing the essence of the matter, they skirt the main issue and talk about peripheral topics to stay away from addressing reality.

When a problem is expressed it is usually one that can't be quantified. For example, after a game loss you may hear comments such as, "For whatever reason, it didn't seem like we had the spunk we normally have." If this were the true problem how would the team practice to get more spunk to correct the problem? Or you may hear, "There were a lot of mental mistakes in the secondary that cost us." But what were those mistakes? Did the other team fake them out, or were they simply outplayed? How can you correct mental mistakes if they cannot be identified? This lack of concern for reality will become much

clearer as you read the more specific examples of the bull that has been perpetuated for many years.

By exposing bull we could raise the level of player development, and as a result, player performance. We should not rely on mass participation and hope that a few good players will float to the top as cream does in milk. We have more talent, better equipment, bigger and better facilities, more money and more coaches than any other country in the world. But we rely on mass participation and hope we will find a great athlete to allow us to compete successfully on the collegiate, professional and world levels. But even with mass participation, as in basketball, other countries with far fewer players are now beginning to develop equal or better players and defeat us. Let's not let this continue.

The central theme throughout this book is on player development. Because of this, the focus is on the coaches, athletes, sports writers and commentators who play a role in evaluating and talking about player performance. Understand that the comments made in regard to the coaches are only in relation to player development. Coaches carry out many other important functions effectively, such as developing strategy, psychologically preparing and motivating players and getting them ready to play.

Coaches will tell you how they are using all the latest methods, techniques and expert personnel to develop the highest-level athlete. They may believe this themselves, mainly because they do not know anything different. By not looking at science or incorporating scientifically based training methods in their development of athletes, they ignore the true essence of player development. What they say falls into a category defined as B.S.

For example, ask baseball coaches and players to explain the differences between a curve, sinker, slider and breaking balls and you will get many different answers. You can find the same definition and description for throwing each of these pitches! Ask five golf pros the sequence of actions in the swing, and you will get five different answers. If you ask a football, basketball or baseball coach to describe the progression of actions in throwing, hitting, kicking, jumping or running, most would be unable to do so. They would make some general statements and espouse jargon that everyone is supposed to understand, but it is really nothing but bull.

The main reason that what coaches and others often say is bull is that it cannot be substantiated with facts. Yet it appears that most coaches, athletes, sports writers, commentators, parents, owners and spectators feel it is their duty to have an opinion about virtually everything related to sports. This includes many things they know little to nothing about! If you think back on your sports experience, I'm sure that when you asked someone a question, they had an answer for you with hardly any thinking involved. On the day following a major league football game we can find many Monday morning quarterbacks who develop excellent hindsight. Even parents often tell the coach what to do and who to play in almost every youth sport game. Since all of the comments are opinion they invariably become B.S.

For the most part, coaches and others are not concerned with the facts, except as they may pertain to their interest in getting away with what they say. Those who produce the bull do not care whether the things they say describe reality correctly. They just pick out certain "facts" or make them up to suit their purpose. Producing bull requires no conviction to know the truth. This is why when seemingly plausible statements are made, they sound great and are then perpetuated to maintain an aura of expertise that does not exist.

In general, athletes are not analyzed to determine strength and weaknesses. For example, when a football receiver, lacrosse or basketball player is unable to catch a well-thrown pass, is his performance evaluated with the goal to determine exactly why he couldn't get the ball, or is it merely a "tough break?" When coaches analyze game film, they look at where the player was or where he should

have been and discuss mainly strategy. They do not look at how the player executed his footwork, whether he had sharp cuts, was able to get free of his opponent, or was too slow in getting to the position needed, etc. These very objective factors could be determined if player performance were a priority.

Instead, coaches, writers and commentators give us bull as to why the players didn't execute as expected. We hear many excuses regarding the athlete and how he had a poor day, was playing injured, couldn't perform up to par, how the team didn't support him, the team had no energy, etc. They are not concerned with objectively analyzing player performance.

Even team presidents are not exempt. For example, after the San Diego Chargers football team lost their last game in 2005, the team president stated, "I'm really frustrated. I really believe we're better than this. But this is a good team, it's a young team, and obviously there are some needs, and we'll address those during the draft. But I like the character of the team more than anything. We have a lot of good character players on this team. And we have a good foundation."

Since he believes the solution is in the draft, we must now ask how he identifies "good character" players to select. His concern is with the character of the team (whatever this is supposed to mean), not with helping the players improve so they can do what the coaches want them to do. Obviously, their concern is not with player development except as it relates to "character."

The success of one who throws the bull depends upon how well they deceive us about reality. Whether or not they do it knowingly, they hide or lead us away from a correct apprehension of what is reality. Keep in mind that one who throws the bull hides the truth of his statements. This is of no concern to him; he simply pays no attention to it at all. We often see this in coaches who want to maintain their position in a ball club. They use bull to satisfy owners or other administrators who also do not understand player development. It usually works as long as the team is winning.

Coaches and others who throw the bull are not merely careless or inattentive to detail. It is, I believe, a way of covering up inadequacies. When coaches know they cannot improve the player's performance, they beat around the bush to give you the impression that they do improve the players. Their description of what takes place is very often fantasy. They concoct it based on a few strands of what they see or know and then merely embellish their statements. They do not give conscientious attention to relevant facts. It is this lack of connection or indifference to how things really are that makes what they say bull.

You may now be asking how I have come to these conclusions. The answer lies in my long and varied career in sports. I have been involved in sports for over 60 years in many different capacities. I began as a sandlot player, played varsity sports in high school and was a multiple letterman in college. I was a high school and collegiate coach and taught kinesiology—previously known as physical education—specializing in sciences such as biomechanics, kinesiology and exercise science. During my 30-plus years of university teaching, I worked with athletes ranging from amateur to professional. In addition, for over 20 years I have been working as a consultant/trainer to athletes and writing articles and books on multiple sports to help athletes and coaches in their training.

Because of my strong biomechanical/kinesiological and exercise science background, I developed a good understanding of what is involved in the execution of the basic skills that are essentially the same in different sports. For example, if the athlete must run, jump or throw in his sport, it does not matter what the sport is because running, jumping and throwing are still the same. There may be minor modifications needed in some sports, but the main skill is the same. Yet we are often told in no uncertain terms that each skill is different in every sport; how-

ever, when proof to show these differences is asked for, it is never given.

B.S. comprises many, if not all, aspects of sport that relate to player development. Coaches talk about developing players, but their main interest is in winning and motivating athletes, not in making a better athlete or developing his or her potential. Many specific examples of this bull are presented in Chapters 2 through 7.

Few, if any, people question what coaches do, or what sports writers (who typically repeat what the coaches say) write, except as it relates to player behavior, especially off the field. We hear much about players and how good (or bad) they are not only in their playing, but often in their social lives.

This is great for barroom discussions, which are usually based on opinion, and for quoting some statistics. However, as most of us should know, statistics have only limited value. The player with the best stats can be the worst performer on any given day of competition and the player with poor stats can be an excellent player on any given day. Few of the statistics gathered are used in player development. Its main use is for strategy and evaluating players to see if they should be drafted. If, however, the stats were used to indicate particular weaknesses which could then be improved, it would be possible to develop much better players.

Everything that is written here can be substantiated. Coaches, sports writers and commentators are welcome to evaluate the statements objectively. This means opinions do not count. Statements need to be substantiated with factual data. As someone once said, "Everyone is entitled to their own opinion but not their own facts." An open discussion on these topics would be a great opportunity to have many of the examples of bull exposed and clarified. This would lead to better understanding and more effective practices to improve player development.

Most names of coaches and athletes have been purposefully left out, because it is possible to find many individu-

als who fit the descriptions and situations presented in this book. In fact, the most difficult task I had was selecting the quotes and situations from the hundreds available. In essence, it does not matter who the athlete or coach is. What does matter is what is that there exists a lack of player development and a need to improve the process.

Chapter One:
The Present Scene

The United States has more athletes, more facilities, more coaches and more money involved in sports than any other country in the world. So why do American coaches have to travel the world to find the best athletes? The answer is simple. The United States has no system of developing athletic talent. Yet every team will tell you it does have a system of player development. This is bull because to have a winning team, professional sports teams buy players, and collegiate teams recruit the best athletes available. As a result, the best teams most often are the richest.

A noted sports columnist in the San Diego area recently lamented the fact that one of the state universities was unable to field a championship team. According to the athletic director, midwest teams " ... are developing great teams because they have the money to buy the best players. The state universities, on the other hand, do not have this kind of money to spend, and thus are unable to compete on the same level. In addition, even though they have scholarships available, they do not have sufficiently large recruiting budgets to get the players that they want."

These tales are not new. We read about them on a regular basis not only in collegiate athletics but in professional sports. For example, in professional baseball, teams that are considered small market teams constantly complain that they do not have enough money to buy the players needed to field a winning team. Money for buying (and trading) is necessary because the team cannot significantly improve the performance of their present players. But,

they continue to throw the bull about their so-called player development!

What the teams, especially small market teams, do not realize is that with effective player development they can become much richer. Instead of having to spend millions of dollars for top ball players, they could spend a fraction of this amount on specialists who could improve the speed, hitting power and throwing abilities of young players in their farm system. The knowledge and know-how is available, for example, to develop pitchers who can throw in the 90-100 mph range and players who can run the 60-yard dash in 6.2 - 6.3 seconds or less. The only prerequisite is to have athletes who want to become better and undergo the training.

As the players begin to peak they would be brought up to the major league team, where they could excel but would still be paid a relatively low salary. In one or two years these players would become hot ticket items and be desired by other richer teams who do not have effective developmental programs. At this time the small market team could sell the athlete to the highest bidder. Note that the amount paid for baseball players today is getting bigger with every passing year, especially with new money coming into the different teams. These players could be sold because the owner would know he has other great players in reserve ready to take the place of those who leave. In this way, the team could be a contender while still making more money.

This concept is very plausible because the knowledge and know-how are presently available. It just takes owners and general managers to understand this concept and to believe in actual player development. CEOs of companies learned many years ago that it is not necessary to go out and buy or hire new workers. It is more effective and less expensive to improve the good workers and move them up. Thus, they have no qualms about spending top dollars to bring in specialists to train their people. Why are major sports teams reluctant to do the same thing?

Recently, the Los Angeles Lakers drafted a 17-year-old player, not to play now, but hopefully to be good enough to play pro ball in three years. He is the youngest player ever drafted and other teams will most likely copy this practice. This is the reason there are now organizations tasked with tracking all up-and-coming youngsters beginning at ages 11-12. If the athletes show promise, they will probably be drafted, and then put on hold to play and mature and hopefully develop into a great athlete. Is this player development? Where is the training?

Professional, collegiate and even high school teams have no system of training to develop athletic talent. Most do not believe it is their task! They just hope the players will play their best in a certain number of years simply by playing more. But this is bull, since game skills such as running, cutting, jumping, throwing and hitting are not improved by only playing or doing drills. Without mass participation, as we have in baseball, softball, track and field, basketball, and to a large extent in football and golf, the number of great athletes who rise to the top is minimal. This is why on some of our most popular sports teams, up to 40 percent of the players are foreign!

If you closely examine player development, it consists mostly of drills and playing. For example, most players drafted in professional baseball are sent to the minors, where they may languish for one or more years (if not for their entire career) before they are brought up to a major league team. Coaches say this is necessary for them to develop the skills to play at the top level. But how does playing in the minor leagues without specific supplementary training improve physical and technical performance?

One of the main reasons for this state of affairs is that U.S. coaches are not educated in the area of player development. It is false to believe that they are experts in their sport. The major criterion to be a coach is to have played the sport. To be a hitting coach you have to have been a good hitter. To be a pitching coach you have to have been a top pitcher. But even if they were great players, most

coaches lack the technical background to understand what is involved in the execution of the different skills or the expertise to teach them.

For example, you will be hard-pressed to find instructional books in any of the major sports that have sequence pictures of the skill execution taken from a single video or film clip. When you do find pictures, most likely they are posed pictures, not ones taken from actual video tape or film. In other words, coaches use posed or still pictures to depict what they wish to highlight rather than to describe or analyze what actually takes place.

To illustrate, in the days of the duel between two great high jumpers, Thomas of the U.S. and Brumel of the former Soviet Union (both of whom used the roll-over technique), the world record often changed hands. The Americans filmed Brumel, and to their astonishment noticed that his right arm was driven upward as he went over the bar. When Thomas was asked whether he also did this, his response was an adamant no. However, when Thomas was filmed it was noticed that he, too, drove his right arm upward as he went over the bar, but just not as vigorously or as high as Brumel. He would not admit that he did this, and for a long time refused to acknowledge that this was correct or good form. Yet it was!

What Brumel relied on is known as the contra-ipsolateral effect in which, when you drive the right arm upward, the left trail leg raises to help clear the bar. It was a very sound and wise technique element. But if we had relied on the words of Thomas or his coach or other track and field coaches, no one would strive to do this. As a result, poor technique would have been propagated and the jumpers would not have been going as high as possible.

This is only one example of a world-class athlete not knowing exactly what he did in his sports event. Many similar experiences can be presented with other world-class athletes. They are excellent at their sport, but they do not necessarily understand everything they do. If, however, more time were spent on learning how to improve technique, and if coaches knew more about technique and how best to develop an athlete's physical abilities, we would be able to greatly improve athletic performance. Understand that everyone can improve, even the world's best. But as you will see, there is so much bull surrounding this topic that it will take a long time to fully realize and accept what is reality and what is B.S.

It is understandable that coaches are not qualified in the areas of technique and improvement of physical abilities, since programs to certify coaches are rudimentary at best. They revolve mainly around how to organize and conduct practices, not what constitutes the core of developing an athlete. We do not have scientific, well-planned curricula for coaches in the United States. Colleges turn out physical education teachers, some of whom become coaches without any or very little additional specialized training. But they comprise only about 10 percent of the total number of coaches presently working. There are no programs designed specifically for coaches that delve deeply into player development.

Ideally, we should have coaches-in-training who are or were competitive athletes, spending one third to one half of each day maintaining their athletic skills at competitive levels. They should be subjects of research, learning more about their sport and others, while having their own performances analyzed to become even better athletes.

The men and women who move successfully through such a program should become high-level coaches. Becoming a coach should not be a whim. Rather, coaching should be viewed as a career that requires special training and education. Every few years, the coaches should receive refresher courses to ensure they are up-to-date on the latest innovations.

Teacher education institutes in the United States are primarily concerned with the development of teachers, not coaches. Coaching is usually a minor, and what is taught in this curriculum is far from what it takes to be a

well-rounded, highly educated coach in the sport or sports in which they specialize. For example, I do not know of a single university that has extensive classes on the biomechanics of the basic skills. When skills such as running or throwing are covered, they are usually done in one class period; however, to fully understand and master these skills takes months.

Thus coaches should not be criticized for their lack of education. In addition, most university instructors are not at the forefront of developng a high-level athlete. They lack knowledge of not only technique but also the latest methods of training to improve athletic performance. For the most part, the universities get their lead from the athletic and fitness fields and teach what is already in vogue. They are not leaders in the field of researching new and effective methods of developing better athletes. As a result, they too surround themselves in a false aura of bull to indicate their expertise.

Because sport has become so specialized and because there are many aspects of total game play that need to be addressed, it appears that no one coach can be capable of carrying out all of the needed functions. Thus, it may be time for teams to bring in coaches who specialize in player development and development of specific qualities. This includes biomechanical analysis experts and exercise personnel who can create specialized strength and explosive exercises that duplicate what the athlete must do in the execution of the sports skill. Strength and conditioning coaches typically found on most teams can continue their work to develop the general fitness of the athlete. The specialized work, however, must be in the hands of a specialist who understands the biomechanics and physiology of the sport.

Over the years, the B.S. in sports has become thicker and more widespread as it has expanded to explain present practices. Bull is unavoidable whenever circumstances require a person to speak with authority about a topic they do not understand thoroughly. This characterizes

many coaches and to a large extent, sports journalists, writers and commentators (who are often ex-coaches and/or players). Sports writers and commentators typically do not have the knowledge to evaluate statements made by coaches. As a result, they become propagators of the bull they have been fed. For the most part, they parrot the coaches' or players' comments without realizing it or simply give their opinion with the implication that it requires no substantiation.

Most sportswriters are journalists, not sports experts. They come into the field through journalism, not through their sports experience, although they may have played some sports. Their major asset is their interest in sports and in writing, not in seeking the truth as in investigative reporting, or in getting answers to some of the problems encountered in sport and player development.

The following are a few examples to illustrate this point. When I was working with a former quarterbackduring his high school career and first year in college, he broke many records for the number of yards completed passing, the number of touchdown passes, etc. He also broke many records at USC.

Near the end of his high school career, there was a major story on him in *Sports Illustrated*. The writer interviewed me at length since I was one of the key people directing his training. I explained to him exactly what I did, where the information came from, and how his training was guided. We spoke for over two hours during which I emphasized that many of the methods were unique and had never before been used in the United States. This included frame-by-frame biomechanical analysis, introduction of specialized strength and explosive exercises that duplicated exactly what was done in the throwing action, and specialized speed and explosive exercises that included the introduction of plyometrics. His training was to be a big part of the story. However when the article appeared, not one word was printed about his training. When I asked

why, the answer was, "Coaches already know about training and player improvement."

"Training" as used here means a systematic approach to developing specific physical qualities and improving technique. It is scientifically based so that each type of training produces a specific effect in a certain period of time; for example, increased strength of specific muscles used in a particular pattern to execute a sports skill. Training does not mean simply working up a good sweat by doing different kinds of exercises regardless of whether they are for strength, flexibility, speed and so on.

With effective training you prepare the athlete for the functions he will or must perform. There are no surprises when he does exceptionally well. Too often, athletes and coaches confuse a good sweat, soreness or fatigue as indicators of how effective the workout was and consider this training. In such cases they may get into better physical shape but it does not mean they improve player performance. Training must be related specifically to improving physical and technical abilities which, in turn, directly influence player performance.

In 2005, a very successful Little League baseball team was written up in all the area newspapers. One of the coaches was interviewed on his hitting expertise, and was quoted as saying that he could merely look at a batter, pick out what he was doing wrong and make the corrections right on the spot. This, however, is impossible to do.

The action that occurs in hitting is so fast that even when you film it with a regular video camera, you only see a blur of the bat. How can the human eye—which sees three to four times less than a camera—see all the intricacies of a swing? It's physically impossible. The only things a coach is capable of seeing are the preparatory movements and the follow-through, not the forward swing. Thus, his expertise was falsely extolled.

When I wrote for *Senior Golfer*, I featured specialized exercises that duplicated different portions of the swing. Since I knew some of the instructional editors, I approached them with the idea of analyzing professional golfers to assess their technique. They were interested in this concept and sent me sequence pictures of four professional golfers, including a world class female competitor. When I analyzed her swing I noted that she had several major flaws based on what is considered the ideal or most effective swing. However, the editors refused to print anything about this since she was one of their playing editors for another magazine and they didn't want to write anything critical of her.

What they and other sports writers fail to understand is that bringing errors or technique aspects into the open will not make the performer look bad or be ridiculed. Instead, such information can help the performer and coach understand what is involved in skill execution and how sports technique and performance can be improved. Once we understand what takes place and how changes can be effectively made, we can improve player performance. Instead, most writers and editors appear to coddle the athletes and coaches and will not let any negative (even if constructive) comments fall on their ears. Doing this keeps us at the same level of performance and merely perpetuates the same bull year after year.

To enhance player performance we should have more analysis of high-level performers and coaching practices. Performance should be analyzed by specialists, and strong and weak points highlighted to help direct the coach in his work with the athletes. Training programs should be analyzed and discussed openly, especially when a team did not have a winning season or was unable to develop high-level athletes, and especially in programs where they already start with good athletes. Findings should be made public so that coaches can learn what other coaches are doing and what can be done to further improve athletic performance. There are no secrets in sports training, even though coaches like to think otherwise.

We should not establish a wall of bull just to make a coach or a team look good. If we want to improve player

performance and allow athletes to reach their full potential, we need more analysis, critical evaluation and thinking. This does not preclude congratulating coaches for doing successful work, even though it may become evident that they can be even more successful. This is a goal toward which we should strive.

Chapter 2: Bull That Has Been Perpetuated for Many Years

According to Harry Frankfurt, "Someone who ceases to believe in the possibility of identifying certain statements as true and others as false can have only two alternatives. The first is to desist both from the effort to tell the truth and from the effort to deceive. This would mean refraining from any assertion whatever about the facts. The second alternative is to continue making assertions that purport to describe the way things are but that cannot be anything except bull." When we closely examine what takes place in player development, both of these alternatives appear to be operative. The following are some common examples.

1. Athletes are born, not made.

For years, coaches have stated that good athletes are born—they are naturals. As a result, coaches believe you cannot make someone into an athlete if he is not born with this ability. This implies that you must already possess the technical skills and athleticism to play the game. This is bull. Coaches see their role as motivators and strategists to blend the team into a functional unit. They often say that they teach the basics of the game, but this generally means basic strategy, not skills. When skills are taught, the teaching is superficial and short-lived (see example 12, Coaches teach game skills).

If you believe the B.S. that athletes are born and not made, then there should be no need to play the game for years before you become great. If you are born with the

abilities or are a natural athlete, why not wait until you are in your late teens and then begin playing the sport? You would probably laugh at this recommendation, yet if great athletes are born and not made, this is plausible. Thus, it should be obvious that this statement is bull. It is the environment—what you do in practices and in playing—that determines whether you will be an athlete and how great you will become.

If you still believe that athletes are born and not developed, then you would also need to know what kind of an athlete you are born to be. For example, are you born to play baseball, lacrosse, soccer, football or another sport? Are you born with the ability to play only one or multiple sports? Can you answer whether some great athletes who lettered or made All-American in more than one sport were destined for this or did they train to make themselves great in multiple sports? When Michael Jordan, an outstanding professional basketball player, tried out for professional baseball, he was unable to make the team. He is considered to be a natural athlete, yet he could not execute the skills involved! Was he a natural or "made" athlete capable of playing only one sport on the highest level?

Because coaches espouse the bull that you are born to be great, they simply have the athletes play more to hone their abilities. To become a better player, they want you to devote more time to playing and drilling to learn game strategies. However, we now know this is not the best way to become a better player. Your technique and physical abilities do not improve simply doing drills; you need supplementary technical and physical training to become better on all levels.

2. It's all in the genes.

Genetics are often touted as the reason for an athlete's success. For the most part, this is bull, but it does play a significant role in some sports. Genetics can account for about 30 percent of your abilities, while environmental

factors such as your training and lifestyle can account for approximately 70 percent of your success.

The role of genetics has been greatly overplayed as a way of explaining why some athletes are so much better than others. This is also how the concept of the natural athlete arose. Individuals usually become "naturals" because of their participation in multiple sports activities in their youth. Youngsters who participate in many different sports at an early age develop the basic neuromuscular pathways that are used in almost all sports. Thus when they take up a new sport, they already have the basic coordination and movement patterns already established. This makes it relatively simple to add on the finer points of the new sport. Success then is not due to genetics, it is due to early training and participation in different sports.

Genetics are significant on the extremes of a normal athletic distribution. A few athletes possess a predominance of up to 95 percent white, explosive muscle fibers, while at the other extreme, a few possess up to 95 percent red, slow-twitch muscle fibers. In between, most athletes have a more equal or somewhat skewed distribution of muscle fibers.

White muscle fibers play an important role in speed and explosive events. To be a world-class sprinter, you must have a predominance of white fibers. An athlete who has a predominance of red fibers will never become a world champion in the sprints no matter how much or how hard he trains.

The athlete who possesses a predominance of red fibers can be most successful in endurance events. Thus, to be a world-class marathoner or ultra-distance runner, swimmer, cyclist or cross-country skier you must have a predominance of red, slow-twitch fibers. An athlete with a predominance of white explosive fibers will never be able to complete the distance at the speed exhibited by top long-distance athletes who have a predominance of red fibers.

Most athletes have a more equal combination of either red and white fibers and they become successful in team sports. A very high percentage of red or white fibers is actually a detriment to becoming successful in a team sport! For example, in basketball and volleyball, sports in which you must do a great deal of jumping and exhibit quick bursts of speed, you must have well-developed white fibers for the explosive actions, and at the same time, well-developed red fibers to play well for the entire game.

Even though you are born with a certain distribution of red and white fibers, that does not mean you will automatically be able to display the qualities which the fibers help determine. You must still train in specific ways to develop one or both fiber types to exhibit the actions for which they are responsible.

The most obvious role played by genes is seen in overall body characteristics, such as your height, type of body build, eye, hair color, etc. Some of these characteristics may limit your success in some sports. Note, however, that even here your training program and technique play an extremely important role in affecting the final outcome.

For example, in a classic study done with identical twins, one trained to be a bodybuilder while the other trained to be a long-distance runner. After several years of training, it was hard to believe that these were identical twins. Their body builds were now very different. This shows that training plays an extremely important role in determining the final athlete.

Even though some of the characteristics are set by the genes, your environment, your eating, resting, workout habits, etc., also play a role in determining the final and optimal levels that you achieve. For example, one who exercises and does many hanging, swinging and jumping-type activities will grow to be taller than one who spends most of his day sitting. Even if they both start with genes that give them identical heights. Thus, you are limited according to your genes, but you can still do much to

work with and around the genes to determine your athletic potential and success.

What I believe may be the most important factor determined by your genetics is the type of nervous system you possess. To a large extent this determines whether you are a fast or slow learner, whether you are teachable, and whether you have the psychological qualities needed to play on the high or highest levels of your sport. For example, we trained a post-collegiate basketball player for competition on the professional level. After two years of training and some playing in the CBA, his speed, quickness and shooting ability were as good as, if not better, than most professional players. However, he did not have the aggressiveness needed to succeed. He played down to the level of the players and rarely exhibited the skills he possessed. Coaches were very impressed with his abilities, but because of his timidity, he was never selected.

Genetic qualities become more important as the level of play increases. Only about one out of every tens of thousands of athletes can be world-class. They are the individuals who have the exact qualities and training needed to succeed. However, for most athletes (90 percent or more) to succeed, genetics is less important and training is more critical. In all cases there must be an optimal combination of both factors.

3. Speed cannot be improved.

This statement comes across as fact, but in reality is B.S. The belief is so deeply entrenched that even though coaches see many of their athletes improve their running speed, they still do not believe that training can make them faster. When coaches do see improvement, they talk their way around it to have you believe it is due to maturation or the athlete is finally living up to his potential. According to coaches' bull, the athlete already has his speed established at birth and through running or participating in other speed-oriented sports is finally able to exhibit his ability!

Such thinking is related to the myth that all talent is innate.

Because of their strong belief in this bull, coaches cannot accept major improvement in running speed (or other skills) as a consequences of training. For example, one of the major San Diego newspapers published a story on whether speed can be improved. They interviewed many area coaches and found only one who believed that speed could be improved. This shows how strongly the bull has permeated the coaching profession. Coaches do not understand that such thinking is hurting the players' ability to improve and as a result, limiting the coaches' ability to have a better team.

It is also necessary to mention race here, mainly because of the bull surrounding the belief that you cannot be a top sprinter if you are not black. For example, a Division I football coach was recently quoted as stating he wished he had more black players on his team. He stated that they are fast, and he needed faster players to have a more successful team.

There is no question that black athletes are some of the best sprinters in track and runners in football. What this is due to, however, is still up for debate. The key point here is that race should not be the major issue. When the coach believes you must be black in order to be fast, he shows a lack of understanding. You can be fast no matter what your race! And as is made evident in the chapter on football-specific bull, the key to being a successful offensive or defensive player in football is to have more quickness rather than raw speed. This is definitely not unique to any race. If coaches trained the athletes to be fast regardless of race, there would be major improvement in performance. Success is due to the training, not to race or nature or other factors.

The bottom line is that speed cannot only be improved, but it can be improved significantly. It can be improved in twoareas: technique and the physical abilities related to technique execution. Technique is probably the most over-

looked aspect for improvement. Studies of professional football, basketball and baseball players show that most of them have poor running technique. This is not an exaggeration! That means most players could be faster with only some simple adjustments in their technique. But because they are still good players, especially when up against other players who have equal or poorer technique or physical abilities, coaches believe they are already at their peak.

The other factor in becoming faster is to improve physical abilities that relate specifically to running technique. This means strengthening the muscles as they function in the running stride. There are three major criteria here. One, the exercise must duplicate the motor pathway seen in the actual running. Two, the exercise must involve the same type of muscular contraction as exhibited in the run. And three, the exercise must develop strength in the same range of motion as displayed in the run. By improving running technique and the physical abilities related to it, everyone can show significant increases in running speed. This is a proven fact that can easily be demonstrated.

4. If it ain't broke, don't fix it.

The bull surrounding this statement is related to skill technique and is commonly heard from coaches. If the athlete is performing well, they say he is already playing at his optimal level. But this has proven to be a false belief. All athletes can improve technique throughout their career. In fact, to maintain optimal performance, technique must be worked on in all stages of training and playing.

If it were true that an athlete should not work on his technique, think where we would be as a society if this bull was applied to other fields. For example, the Model T Ford was a great car in its day. It worked. It got you from point A to point B and was generally a great experience. If the engineers believed that since they had a good working model they should leave it alone so it could continue

to work the way it did, we would never have the supercars we see today.

Rather than saying they should not fix technique, coaches should make changes or modifications if they will improve the athletes' performance. The same applies to a car engineer. If the car engineer understands the mechanics of the car and if he has ideas that can make it better, he can develop a better machine. Thus, we can see constant progress in the development of the athlete, just as we have seen progress in the development of the car.

However, most of the major improvements that have taken place in sports are in equipment technology: the fiberglass pole in pole vaulting; different-sized heads and materials in golf clubs; different-sized gloves in baseball; different materials for running tracks, hockey sticks, lacrosse sticks, and baseball bats; aerodynamically efficient helmets; etc.

Statisticians are hired to come up with various equations to evaluate different aspects of player performance. This then tells the coach how effective the athlete is when playing offense or defense or when certain players play with or against him. As a result, coaches can better develop strategy of play to enhance their winning. To date, none of this information is used for player improvement. For example, if it were determined that a player was weak on rebounds in basketball, wouldn't it be logical to train this ability so that the athlete would no longer have this weakness? Instead, coaches maneuver the players so the weak rebounder will not have many opportunities to rebound.

The key element in debunking the bull about fixing technique is to have knowledgeable coaches who understand what is involved in technique and can apply science to make technique more effective. Coaches should not fix technique if they do not understand what is involved, or if their fixing has the possibility of making technique or performance worse. Coaches should modify technique only when they know the changes will improve the

athlete's performance. This takes deep scientific understanding of what is involved. But instead of getting outside help in this area, coaches mask their lack of knowledge by throwing the bull. Up to this time, they have been successful in this practice because no one has challenged their statements.

Minor technique changes can often significantly improve an athlete's abilities. For example, a professional baseball player wanted an evaluation of his throwing technique. After filming and evaluating his technique, we discovered that he was basically an arm thrower (similar to many other players) and did not use his body very effectively for the production of force. As a result, he couldn't throw very far or with great speed.

To improve his throwing, he had to learn how to include hip rotation prior to shoulder rotation. Once he mastered this, he was amazed at the difference in his throwing. According to him, the throw now felt effortless. He was able to throw harder without exerting the arm force that he typically used. He learned to use his body to produce force in the throw, and use his arm for better accuracy in the throw. As successful as he was, he became an even more accomplished fielder.

These changes were made in the offseason. Major technique changes should never be made in season, as it will usually interfere with playing performance. Understand that any significant change that is made in technique requires weeks, if not months, of practice until it becomes automatic.

5. The key to success is to play more.

The bull surrounding this statement probably stems from the false information we were fed during the Cold War with the former Soviet Union and East Germany. It was commonly reported that in these countries they literally took the child out of the crib and made him into a particular type of athlete. These youngsters, once selected, did nothing but practice their sport until their competitive

careers were over. Because of this, U.S. coaches thought that it was necessary to play more in order to become great and that the playing had to start at a very early age. The more you played, the better you became.

Playing more in youth serves a very important role in improving an athlete's overall performance. However, playing more does not mean that you are also becoming stronger, capable of jumping higher or running faster or throwing harder, etc. Nor does it greatly improve your technique. Most of the physical improvement comes from maturation together with strategy and learning to work with other players. These latter components can only be gained from more playing, but if playing is the only modality used, it will never develop the athlete's maximum potential.

There must be separate trainings to improve technical and physical abilities, especially as they relate to technique execution of the basic skills. This should start in earnest when the youngster reaches the ages of 9 to 12. A key factor in development is to play several sports. The wider variety of sports a youngster plays, the more coordinational abilities and overall fitness he or she will develop. As a result, youngsters can learn proper game fundamentals and not ingrain poor technique that will be hard to change when older.

The concept of more playing is also seen when teams prepare for the season in professional baseball, basketball, football and other sports. When the teams initially get together, they usually stretch, do some physical training and run drills for a couple of weeks before they begin scrimmaging. After several weeks of practice they begin league practice games for several weeks and then the season starts. Thus, most of the preparation revolves around playing more. Isn't it ironic that in football some of the best players are spared from preseason playing to prevent injury?

Not playing to avoid injury is now permeating the baseball world. For example, many professional players re-

fused to play in the World Baseball Classic because they felt they would not be physically ready and did not want to expose themselves to possible injury. They believe they need two-to-three months of gradually increased throwing, hitting and running before they are prepared to play all-out. This only indicates how out of shape they are when they report to camp. It even takes most pitchers one-to-two months of inseason playing before they regain their form and ability to last nine innings. This is one reason why it is now a rarity to see 20 or more game winners. Note also that they do not improve from year to year. This is impossible with only limited throwing and no supplemental training.

Coaches insist on more playing because they feel that the athlete should already have the skills and physical ability to play the game. They do not have time to improve their physical and technical abilities; they must already be the best. This is why buying and trading players is so important to them. They know that if they cannot buy the best players, they will not have the best teams.

If colleges and high schools were set up mainly to improve player performance, they could serve as good sources for top players. But they are not. Colleges and high schools are set up to win at all costs, not to best develop the athlete's abilities! This is why recruiting is so important. It also explains why on the professional levels we do not always have the highest-level players. They all have room for improvement.

6. To be the best you must play year round in your selected sport.

The bull surrounding this statement is related to that in Example 5. Because everyone started believing that athletes should play more, private clubs, elite teams and traveling teams began to appear in addition to high school, collegiate and summer league teams. This allowed the athletes to continue playing competitively on a year-round basis. As a result, there was little time to work on specific

qualities such as strength, agility, flexibility, power, etc. in separate sessions. All of the so-called "training" revolved around playing.

However, studies and practical examples have shown that most of the athletes who participate in one sport on a year-round basis from a very early age usually burn out by the age of 14. Because they are no longer interested in the sport, we lose many potentially excellent athletes.

If we focused on developing the athletic potential of youngsters instead of perpetuating the myth that they must play year-round, we would be able to do a much better job of player development. There is no scientific reason for youngsters to play year-round in one sport, especially when very young. Even on the highest levels, it is not good practice to play year-round. All athletes must take a break from the sport, if not for physical reasons, then for mental reasons. Getting away from the sport while doing other sports and activities is beneficial to both mind and body and allows the athlete to become even better in the chosen sport.

There are times when success can be attributed to playing only one sport all the time. This however, is very rare and usually short-lived. Notable exceptions can be seen in gymnastics, figure skating and in individual sports. For example, according to the press reports, Tiger Woods started playing golf when he was 2 years old and played throughout his school years to his current playing as a professional. That he became one of the world's best golfers is quite astounding, since it takes a very strong personality to be able to persist in the same sport and play or practice the same sport for hours every day.

Although he appears quite happy with his accomplishments in golf, it can also be said that he missed out on many other fine activities when he was a youngster. Understand that to become a world-class athlete, it is not necessary to start at such a young age. Youngsters who are 7, 8, or 9 years old can easily catch up to someone who starts much younger and plays as well, if not better,

after one or two years. Tiger should be considered an exception, not the rule to follow.

7. You can't be great without the use of steroids and/or other drugs.

The bull surrounding the use of steroids is one of the most difficult to eliminate because it has been perpetuated for so many years and has some basis for support. There is no questioning the fact that steroids can make you stronger and can help you recover more quickly from heavy workouts. This in turn allows you to do more work. Because of the increases in strength and improved work capabilities, some athletes do improve. However, the improvement witnessed is temporary and only when taking the steroids. Once the athlete goes off the steroids, there is a remarkable decrease in body size and loss of strength unless the steroids are replaced by other drugs. As a result, there is ultimately poorer execution of game skills and playing performance.

A key reason for the belief that you can't be great without steroids is that very few athletes know what it's like to train scientifically. If you have a sound training program that includes biomechanical analyses of your technique, together with specialized strength and explosive exercises to enhance your physical abilities, you will see tremendous improvement in playing performance. Then using steroids will do little to nothing to enhance your performance. It may even be detrimental.

In our comparison studies of team sport athletes who used steroids and others who trained scientifically without the use of steroids, it has been shown that the athletes who did not use steroids out-performed those on steroids. The differences were significant. However, the belief that steroids are needed is so strong that athletes are afraid not to use them if they want to make the major leagues or get into a particular college.

The bull surrounding steroids gained prominence in the 1960s-80s when the former Soviet Union and East Ger-

many were dominant in sports. The U.S. media did not report on their training method. Instead, they highlighted or made many unsubstantiated statements alluding to the "fact" that the Russians and East Germans were victorious only because they used drugs and paid their athletes. They did not report that U.S. athletes were also taking drugs, nor did they highlight the new and sophisticated training methods that these Eastern Bloc countries were using at the same time. Many of these methods are now the latest innovations in U.S. training.

Especially distressing in the area of drug use are the comments made by spectators, coaches and athletes. They show that drugs are often thought to be indispensable to high-level athletic performance and that without them athletes would not be able to do as well. For example, baseball coaches have been quoted as saying they will need expanded rosters and the players will need more time off if drugs are banned. It has reached the point that they believe the players must have the drugs in order to be able to perform, but they ignore the information that is available on how to improve and maintain top-level sports performances. In addition, many fans believe the players will not be able to play up to par so fans will not be getting their money's worth. They believe there will be fewer home runs in baseball.

However, just the opposite is true. If sound training programs were incorporated, we would see high-level play and athletes would be developed to their full potential. We would not have to rely on drugs for one or two outstanding feats, such as more home runs, with a concomitant decrease in speed and overall playing ability.

8. You must work on greater flexibility to prevent injury.

The amount of B.S. perpetuated about flexibility and stretching seems to increase with each passing year. There is also much confusion about the type of stretching that should be done. For example, the most common type of

stretching for flexibility and warm-up is static stretching, in which you hold the end position of a stretch for 30-60 seconds, while completely relaxing the muscles. Sometimes someone will push you a little farther into the stretch to increase your range of motion. This is called passive flexibility. These methods are the main means of stretching used to increase flexibility and to warm up on high school, collegiate and professional teams.

However, it is well-documented that static stretching does not prevent injury. In addition, static and passive flexibility have no correlation to athletic performance. In many cases they cause poorer performances! The reasons for this are many. Static stretching does not warm up the muscles to prepare them for action. Static stretching, especially when done over a prolonged period of time, overstretches the ligaments and tendons, creating looser joints which are more prone to injury. In addition, for static stretching to be most effective, you must first warm up. This defeats the purpose of using static stretching as part of the warm-up.

The role of active stretching is often overlooked. Active stretching has proven to be directly related to athletic performance. In active stretching, the muscles are engaged and activated. As a result, they get warmed up and prepared for moving the limb or body through the range of motion needed. Thus, active stretching plays a positive role in preparing you to play. This is the type of stretching all teams should engage in for warm-up. In addition, it can be used to increase flexibility.

Not all athletes have to become more flexible. Every sport and every skill or action require a certain amount of flexibility. Going beyond this amount may stretch the ligaments and tendons beyond their normal range of motion, which then makes the athlete more susceptible to injury. Many specialists now believe that overstretching is one of the reasons that teams have so many injuries, especially early in the season. The overstretching they do does not prevent injury, it causes injury!

9. You need specialized shoes for your sport.

If you have ever received a catalog from a sports equipment store, you learn very quickly that there can be over 100 different types and/or styles of shoes for running and other activities. There are some for pronators, supinators, some who run neutral, some who are fore-foot hitters, etc. You can find shoes for cross-country, cross-training, aerobics, volleyball, football, basketball, tennis and so on, together with different styles by different companies.

However, to say that you need a specialized shoe for each sport or for different runners is, for the most part, bull. The main purpose for using shoes is to help prevent injury if you step on glass or rocks or if you run on rough surfaces such as asphalt and concrete. Some sports require specialized shoes with cleats or spikes to prevent slipping.

Studies have shown that running shoes may even be the cause of injury to runners. However, the hype surrounding shoes is so great that most athletes have been brainwashed into thinking that they need a particular shoe in order to be successful. This is why companies spend millions of dollars to have a high-profile athlete endorse a particular shoe or have one named after him or her. To compound matters, athletes are often forced into using a particular shoe if the team has a contract with the company. The athlete cannot use a shoe he feels more comfortable in or that allows him to perform at his best.

If we closely examine the different shoes that are presently on the market, you will see that many do not do what they purport to do. For example, having a well-cushioned heel supposedly helps you run better, but it does so by allowing you to run incorrectly. Landing on the heel is a detriment to effective running, as it leads to increased injuries from the forces experienced on every heel hit. When you have ample cushioning, as when the shoe is new, it can absorb much of the force, but as the shoes

begin to wear out, the forces travel farther up the body and can cause injury to the ankle, knee, hip or lower back.

Shoes with arch supports may prevent you from overpronating, but at the same time, do not allow your foot to function normally. There must be some pronation (inward rolling of the foot) in your running. The key is to not have excessive pronation. To prevent this, you need specialized exercises to strengthen the muscles involved so that excessive pronation does not occur.

Some shoes such as cross-trainers, aerobics and basketball shoes are advertised as having increased lateral (side) support to help prevent ankle injuries. However, this is bull regardless of whether the shoe is low or high cut. For support in a high-top, you must lace the shoe tightly in order to prevent side motion of the foot. This in turn does not allow you to run or jump with a full range of motion in the ankle, nor does it allow you to execute effective cutting actions which require side bending of the foot. Because of this, athletes lace high-tops loosely so they can perform as needed, but in doing so have no lateral support.

Today we are seeing a resurgence of barefoot running. This is a good trend, because in order to run barefoot, you must have effective technique. With running shoes, you can get by with incorrect or poor technique. But if world-class runners can run races barefoot, how much help are you really getting from the shoes? The best advice to most athletes is to find a shoe that is comfortable and that fits you well. This is the key to success. In addition, do foot exercises to strengthen the muscles and support structures of the foot, or use products such as the Barefoot Science Insole System, which strengthens the foot arch during your walking and/or running.

10. Coaches use science to give legitimacy to their training.

If the practice of misusing science were not so widespread, one could laugh about what many coaches and

companies say. But in recent years, scientifically worded "facts" have been used more and more to explain or to support a particular point of view. It's usually bull. It is deplorable because it is so misleading, but it's a great cover up or marketing gimmick to sell a product.

Consider this statement: " ... this theoretical and practical approach to running ... is that you employ gravity as the major force pulling your body in a horizontal direction, while the rest of the forces resist the same pull. Integration of these forces only happens in a certain frame (point) of space and time in relation to your body position." This sounds impressive, but it's bull. Close examination of the "fact" that gravity pulls your body horizontally is false and impossible to attain. Gravity can only pull downward. Gravity cannot be used to pull your body in a horizontal direction. You cannot change the laws of nature, or make gravity go in different directions.

In addition, to state that integration of these forces only happens in a certain frame of space and time in relation to your body position when running is also false. There are three distinct phases of force production in running. All the forces are not integrated at one time or displayed in one body position. If this were true, it would matter little what you did when you were airborne. But the forces that create horizontal speed in running are created when you are on the ground as well as airborne.

In golf, many pros use "scientific" terms to explain what happens in the swing. It is not uncommon to hear a golf pro say, "Momentum will carry the club through the hitting area." Or you can read in golf magazine articles that "gravity is a major force pulling the arms and club downward into the hit." The authors opine that after the backswing, when the club is at its highest point and you start to swing downward, you generate momentum and gravity pulls the club down and accelerates it through the hit. If this were true it would also apply to fast-pitch softball and underhand hits in handball and badminton.

In reality, momentum plays a minor role in the production of power. In order to get maximum speed of the hitting implement, it is necessary to generate maximum acceleration. This means you must apply force through muscular contractions and involve multiple joints to produce the force needed to accelerate or maintain speed of the hitting implement into the hit. If momentum were the only force involved, it would not be necessary to continue pulling the arms down and through or to have a wrist break. Gravity and momentum would take over as soon as you started the downswing. But as any athlete will tell you, without arm and wrist actions, you will never have a powerful hit. Gravity and momentum have little to do with power in the golf swing, underhand pitching or hitting, but the terms are impressive and many players are duped by this bull.

In baseball, a pitching analyst stated, "The law of reaction requires that pitchers apply force toward second base equal to the force they apply to baseballs toward home plate. If pitchers want to apply greater force to their baseball pitches, then they have to apply greater force toward second base. Pitchers have three ways to apply their oppositely directed force. First, pitchers can push harder against the pitching rubber with their rear legs. Second, pitchers can push toward second base with their stride legs. Third, pitchers can use the inertial resistance of their body mass against which to apply oppositely directed forces." Note that in this case the force is applied only to striding forward. It does little to put speed on the ball at this time as other joint actions are still to come.

In another instance it was stated that, "When pitchers inwardly rotate their upper arm, they pull their pitching arm downward in an arc. Therefore, they have to release the baseball tangent to that arc. This action not only greatly reduces the consistency of their releases, but it unnecessarily stresses the supraspinatus muscle." Note, however, that all pitchers must medially (inwardly) rotate their arm on almost every pitch. It is a natural consequence in cor-

rect throwing and is needed to get the fingers behind the ball to push it forward. Also, every ball thrown is released on a tangent. There is no other way!

Another point to consider is the excessive hype regarding the research being done in various sports . Most studies have little impact on the sport, mainly because they are not valid or have serious flaws. As previously stated, many university professors are not abreast of the latest information pertaining to sports performance. Since they are not on the frontier in this field, the research is too old to be valid.

In the university research, college students, often physical education (kinesiology) majors who are supposed to be fit or involved in sports, are usually used as subjects. However, only about one-third of the subjects fall into this category, yet the results of the studies are extended to include all athletes on all levels. This should never be done, mainly because bona fide athletes react differently to the same workouts. For example, training programs and exercises for high-level athletes have no effect on low-level athletes and vice versa. Thus the training must be very specific to the level of the athlete. Because of this, the research must also be very specific to the population. As you can see, there is much to be done in this area before we have valid research to guide the training of our athletes.

11. The key to a winning team is a good coach.

Most people will agree on the face value of this statement. A good coach is needed for a winning team, but why doesn't a great coach with poor players have a winning season? Winning teams also have the best players!

A great coach should be one who can take a group of good athletes and make them into great athletes to produce a winning season. This, however, rarely happens. On the highest levels, the best coaches are typically great at what I call "player psychology" and game strategy.

They are capable of taking a group of high-level players, usually with big egos, and blending them into a team that can work together to carry out the game plan. In some cases the team may only have one or two outstanding players, and the others essentially occupy the other spots to feed or support the main players. In this case is success due to great coaching or to the availability of one or more great athletes?

A conversation during a 1980s USSR-USA track meet between one of America's top collegiate coaches and some of his Soviet peers illustrates this. The Soviet coaches asked how the U.S. teams consistently produced such great sprinters. Rather than crediting his own training techniques, the U.S. coach simply responded, "We have so many good runners that if they're not great in the 100 or 200 meters, we'll put them in the 400 or some other distance. We'll find a place for them. I really don't do much coaching of them at all; they're already good. I just psych them up." The Soviets, disbelieving, continued to seek information about how he trained his athletes. But the U.S. coach simply responded, "I'm not keeping any secrets from you, because I don't have any. I just don't do much with them at all."

If you read the newspapers and sports magazines or listen to coaches' interviews, you will invariably find many coaches stating something to the effect that the team did not play well or the players did not execute the plays as they should have, or perhaps the players did not perform up to their capabilities. In addition, it is not uncommon to find a coach so angry with his team that he makes comments such as, "If the team doesn't play better I will quit." Or you may hear other nonquantifiable comments such as, "It didn't really seem like there was a lot of energy out there," and "We were kind of going through the motions like we weren't playing a good team."

These are not idle comments, but indicate the extent to which coaches believe that the athletes should be able to perform as they want. It indicates that coaches have noth-

ing to do with their improvement or player performance. The players are there merely to execute the strategy that a coach dictates. The players are there to perform, not to be exposed to any training philosophies to make them better. As a result, the concern is with coordinating the team, motivating them to play their best, and teaching them the strategies they want executed.

That coaches are not as important as we make them out to be can be illustrated by the musical chairs played by most major teams. We see many coaches fired at the end of a losing season only to be picked up by another team, usually with a losing season, and then within one or two years they may have a winning season. What most people ignore is that when the new coach comes in, they also bring in new talent that the coach specifically asks for or needs to develop his strategy. If the owners don't give them what they want, they usually quit. But if the coach were truly great, he would be able to develop a winning team regardless of the players. If this is not true, then we have been fed a lot of bull, since we need good players in order to have a good coach.

12. Coaches teach game skills.

This statement is not 100 percent bull because it does have some elements of truth. However, if we closely examine the teaching of game skills, especially to youngsters and teenagers, then we can see where much of the bull lies. For example, many coaches teach skills via the "watch-me-do-it" method. The coach will execute a particular skill and then have the athletes copy it. The coach may also give some verbal explanation of the skill and then have the players attempt it. There may or may not be corrections made while the players practice the skill. After five or 10 minutes of practice, they either go on to another skill or get into drills or game play. This method does not allow for effective learning of the skill unless the athlete goes home and practices on his own until he has some semblance of mastery.

The watch-me-do-it method has value with youngsters who cannot comprehend verbal instruction. They must see the action and then try to copy it as best as possible. In doing this, however, it is critical that the coach also make constant corrections until the skill is mastered. Only practicing for a few minutes and then getting into game play is not sufficient for mastery of the skill. Understand that it usually takes hundreds if not thousands of repetitions of a skill before it becomes ingrained and automatic. This is when a skill is considered learned. Merely repeating it a few times and then going on to something else is not learning. When you attempt the skill again after one or two days, you will be back to square one and must relearn everything from the beginning.

With adult athletes, the prominent teaching method is typically what I call "position learning." This method evolved from coaches who looked at pictures or films of high-level athletes and noted the position of different body parts, such as the position of the arms and legs in a stance or during follow-through, or the position of the hitting implement at a particular point in the skill execution, and so on. The teaching consists of having the athlete duplicate a particular position and then execute the skill. This is why in most books and magazines you will see pictures of specific positions the instructor says you should reach at a particular point during the execution of the skill.

The reason such teaching is mainly bull is that to master a skill you must learn actions, not positions. When you work on a position you are not learning how you move into that position or what other actions are happening simultaneous to or subsequent to that position. You do not learn the feel of the action. For example, when throwing a ball many coaches will have you first cock the arm and then throw. However, in actual throwing the shoulder turn cocks the arm. Thus the shoulders must be in action in order to get the arm cocked. You do not volitionally bring the arm back to cock the arm. It hap-

pens automatically when there is good technique execution.

In tennis and other sports, instructors have the student first execute a backswing. They bring the arm back, rotate the shoulders, shift weight to the rear etc., and then begin the forward swing. However, in reality there is an overlap between forward and rearward movements. For example, you may be stepping into the ball when the arm is still going back in preparation for a forward swing. Thus, the key to effective learning is to teach actions so that the athlete learns the feel of the movement and how it is executed correctly. In this way the athlete will be able to duplicate the portion of the skill that is being learned and incorporate that action into the total skill.

Coaches may also rely on drills when teaching skills. However, when learning, it is important that the athlete devote maximum concentration to mastering the skill. Doing drills does not allow sufficient time for concentration on individual joint or limb actions. In a drill, concentration must be devoted to carrying out the drill rather than focusing on what joint actions or body movements must be mastered.

13. Injuries are unavoidable.

"I hope there will be no injuries next season. We could have done better if only we had had a healthy team." These are common statements heard from coaches, commentators and athletes. However, hoping for something to happen or wishing that certain things had happened is not the way to improve player performance or prevent injuries. These are noble wishes, but by themselves do not translate into action.

It is impossible to prevent all injuries, but many of the common injuries are preventable. This includes low back pain or muscle spasms, hamstring injuries, ankle sprains, rotator cuff injuries, and so on. For example, athletes who learn proper running and cutting technique and do exercises such as the glute-ham-gastroc raise hardly ever experience hamstring injuries.

When athletes have injuries to the back, it is usually becuase they did do exercises to strengthen the lower back muscles or use proper exercise technique. Most coaches tend to do more stretching of the lower back rather than strengthening. In addition, coaches do excessive amounts of abdominal exercises believing they strengthen the back. They do not. To strengthen the lower back muscles you must do exercises such as the back raise and the back raise with a twist. These are the only exercises that develop the lower back muscles through their full range of motion in extension, rotation and in their most commonly executed actions. They go a long way toward preventing injury.

Even ankle sprains can be traced to inadequate strength and improper technique of cutting actions and jump landings. As important as ankle strength is, it is rare to find an athlete doing ankle- and foot-strengthening exercises. These are the key to preventing injury.

For example, doing exercises such as ankle adduction, in which you turn the sole of the foot inward against the resistance of Active Cords, strengthens the muscles, tendons, and ligaments on the inner side of the ankle. Doing exercises such as ankle abduction, in which you turn the sole of the foot outward, strengthens the muscles, tendons, and ligaments on the outside of the ankle that are most commonly involved in an ankle sprain. The key here is to examine closely how a particular body part functions in most sports and then do strength exercises that duplicate these actions so that injuries can be prevented and, at the same time, performance enhanced.

14. Coaches are interested in improving performance.

This comment is heard often but rarely seen in practice. For example, I had a 16-year-old athlete come to me with hamstring problems. He was a good runner but could

never show his potential because of injuries, which were partly due to his running technique and training. After taking care of his hamstring problem, we began working on his running. Within two years he won the regional high school championships for the San Diego area. He won both the 100-meter and 200-meter sprints against very formidable opponents. However, his coach and other coaches were not interested in what he had done to improve.

This athlete is now one of my protégés who uses the Yessis System of Improving Performance. He is having great success in improving the speed of many up-and-coming collegiate and minor league baseball players. One of his players was written up in baseball circles as having great potential to make the major leagues, but he was too slow. After training, he was listed the following year as one of the fastest players available. He now plays for a major league team, yet none of the coaches were interested in how he became so fast or so capable of playing better. They simply accepted the fact that he was fast and were not concerned with his training. This is one example of how most coaches are interested in only buying or trading for the best athletes, not in how they can improve the athletes they already have.

Another example occurred when I was working with a group of international runners at one of the state universities. We were looking at videotapes of the runners which included a world-class 800- and 1500-meter gold and silver medal winner in many world championships and three Olympic Games, the South American steeplechase record holder, a top African sprinter, and others.

Before long the football team was walking by after spring practice. Many of the players stopped to look at what we were doing and were very interested in the technique analyses. The coach, who was once and is again a professional football coach, stopped and inquired what we were doing. I told him we were analyzing running technique

to improve speed. He watched for a couple of minutes, grunted and walked away.

15. To be a better player you must develop greater strength and muscle mass.

In general this statement is bull. However, in specific sports, or more accurately, in specific positions and events, it is not bull. For bodybuilders, powerlifters, football linemen and field athletes, greater strength and muscle mass is necessary. Other athletes need strength but not necessarily muscle mass, which can be a detriment to performance.

Strength is extremely important for athletes since it is the foundation for many other physical qualities. In general, the more strength you have the more you can increase muscular endurance, demonstrate active flexibility, hold the spine in its normal safe curvature, have good dynamic posture, effectively learn sports skills, help prevent injury and run faster.

However, constantly increasing strength can be a negative for skill execution and speed. It is a catch-22 situation. Greater strength leads to greater speed. But if you gain too much strength without training to get a corresponding increase in speed, speed will decrease and you will be slower. The reason for this is that in order to gain greater strength you must use heavier weights with which the movements are slower. As a result, your nervous system learns slowness, not speed and quickness. Thus, the bottom line is that you should increase strength only when there is no decrease in speed. But we do not see this in today's training programs. Strength has become the number one factor, with no regard to its effect on running speed or quickness of body and limb actions.

The amount of strength and/or muscle mass gained must be commensurate with the development of the other physical qualities involved in the sport. Understand that all athletes need varying degrees of muscular endurance, speed, power, flexibility, agility and so on. Thus, ample amounts

of training time must be devoted to all of these factors, not merely strength.

The bull that arises here is related to the often excessive amounts of strength (and mass) that many athletes are now striving to attain. In most sports it is not the amount of strength that determines success, but the above-mentioned qualities that are often even more important. For example, agility is probably more important than strength or linear speed in sports such as soccer, lacrosse, basketball, and for offensive and defensive backs in football.

In addition, the more strength and muscle mass you develop, the more you must modify and adjust skill technique. Gaining excessive amounts of strength can interfere greatly with skill execution and, as a result, make you a poorer athlete. Thus, the bottom line is that development of all of the physical qualities must be in line with one another and no one quality should dominate the others.

Chapter 3
Baseball-Specific B.S.

1. Youngsters should not throw a curveball.

The bull associated with the curveball is getting deeper every passing year with the increasing number of injuries from throwing this type of pitch. Even doctors are concerned with the increasing number of "Tommy John" surgeries being done to treat the elbow. However, the curveball is not the culprit; rather it is the method coaches teach to throw a curveball that is erroneous and dangerous. Compounding the problem is the lack of consensus as to what constitutes a curveball.

If coaches would look at the scientific research or have some independent videotape analyses done by experts on how the curveball is thrown, they would learn that they are teaching an improper, ineffective and dangerous way of throwing. This has been proven with major league pitchers who were filmed at high speeds to examine all the minute actions of the hand and arm.

In newspaper and magazine write-ups, there are statements quoting notable coaches explaining the incorrect way to throw a curveball. For example, according to Tommy Lasorda, "As you come around to throw, turn the back of your hand to the hitter. Bend the wrist, spin the ball, flip it straight over so that your palm is facing you, pulling the ball down with your middle finger and pushing it with your thumb to make it go over." There was even an article in *Sports Illustrated* in which Sandy Koufax, a great former pitcher, explained the curveball in basically the same manner. He even demonstrated with a

picture showing the back of his hand facing the batter at release.

The method described appears to be a very logical way of throwing since it does create spin that causes the ball to curve. Perhaps this is why so many people believe that a curveball should be thrown in this manner. However, when you throw the ball with hand supination — the act of turning your hand so that the back of it faces the batter at release — you do not have much force behind it. You cannot throw it very hard. The harder you throw it, the more you must snap the elbow, which then leads to elbow problems.

Pitchers who throw a great, safe curveball use pronation of the hand and specific placement of the fingers to create the curve. In pronation, the palm is turned outward so that at the moment of release, the fingers are behind the ball and capable of imparting spin and force to the ball. After the release, the palm turns to face out to the side. However, few coaches teach this way of throwing a curveball and instead just perpetuate the same bull. It should also be noted that when you throw the curve with hand pronation, not only do you get greater side spin, but you have more force and speed on the ball to make the curve break even more sharply.

Because of incorrect technique we see more teams limiting the number of pitches the young pitcher can throw or the number of innings he can pitch. But if the youngsters were taught correctly how to throw the different pitches, they would be able to do much more, especially if they also did some throwing-specific physical and technical training. It would not be necessary to curtail their pitching if correct technique was used and they were physically prepared.

The myth surrounding the curveball is a classic example of how coaches and high-level athletes do not understand how a particular skill is executed. They teach what they think happens, not what does happen! As a result, they

perpetuate an incorrect practice which over time becomes a well-ingrained "truth."

There is even more bull in regard to exactly what constitutes a curveball. If you talk to a sufficient number of coaches, you will find that their definition of a curveball varies greatly. Some state it is a ball that breaks left or right, others state it is a ball that breaks downward, and still others state it is a ball that breaks down and away (to a right-handed batter). When I was a young pitcher in the late '40s and early '50s, a curveball always meant a ball breaking to the inside or outside and only a sinker broke downward.

The trend today is to describe the curveball as one that breaks downward and often down and away. This may be because it is extremely hard to throw a ball with only hand supination. To make it easier but less effective, pitchers throw the ball with a combination of top and side spin to produce the down and away pathway (also known as a slider). But to get the biggest curveball, one that breaks only to the inside or outside, it would require pure side spin. Anytime the spin is at an angle, the effect will not be as dramatic.

For example, a recent article in *Sports Illustrated* discussed how Barry Zito had a great "dangerous" curve. According to batters, it was very hard, if not impossible, to hit because of its drop. In the article, Zito described the curveball in exactly the same way as when throwing a sinker — the hands go over the ball to impart top spin. This is not how the curveball was described by other coaches. In fact, if youngsters threw the ball as Zito described, they would not get Little League elbow. Thus, until there is a true consensus on what constitutes a curveball and how it is thrown, coaches perpetuate more bull because of their different interpretations.

Not surprisingly, when these discrepancies are mentioned to sports writers, they are not interested in finding the truth of the curveball. They do not care to poll various coaches to see whether we can understand or at least have

a consensus on the curveball and other pitches. From this I can only presume they would rather we continue with misinformation than to get to the truth and clear up the bull surrounding the curveball.

2. Spending more time on mechanics will mess up the player's ability to perform well.

The B.S. concerning this statement is related to a misconception stated in Chapter 2: If it ain't broke don't fix it. Because of the lack of technical knowledge exhibited by many coaches, most bull is perpetuated as a cover-up. The fact is you would be hard-pressed to find a single team that works on the mechanics of a swing, throw or run. If mechanics were paramount we would see more instructional books on hitting, throwing, running and kicking that go into detail on how these skills are executed. But I have yet to find even one book that does this.

Most instructional books by professional athletes or coaches offer posed sequential pictures, not pictures taken from original film. Thus, most of the instructions and recommendations on how to execute or improve a skill are bull because they consist of only what the coach thinks happens. If they cannot substantiate what they say with true-motion pictures, even though at times they may be correct, they are giving us false information.

When a skill is truly learned, execution is automatic. There is no thinking involved. However, when you want to change your technique, there is considerable thinking involved. The brain must be engaged so that it can tell the muscles what to do and how to do it. It must interpret every action to constantly modify the skill until you establish a new pattern. Because of this, making significant changes should only be done in the offseason when you are not playing. They should never be done during the competitive season. (This is another reason why youngsters should not play the same sport competitively on a year-round basis. There is never time to work solely on technique or improvement of physical abilities.)

Adjustments should only be made in season if the player develops problems because of a change in his strength levels, is coming back from an injury, or needs a little fine tuning. In such cases it may be necessary to make adjustments to get the player back to his automatic execution. Such work is also needed when players go off steroids. Their throwing or hitting is changed mainly because of losses in strength. Some athletes regain their basic patterns with additional strength training, but others never again attain a strong swing or throw and become, for the most part, has-beens. Inseason fine-tuning should always be done to keep players at their peak performance level. No one can maintain the same perfect pattern every day, all season long. It's the same for race cars; they are adjusted and fine-tuned for every race.

3. Yoga and Pilates are the best methods to improve an athlete's ability to perform well.

This is fresh bull that has become firmly established over the last few years. It now appears that almost all major league teams use yoga and, in many cases, Pilates in the conditioning of their players. It is not just an auxiliary aspect of their physical training; it is a main part. The reason for its acceptance is quite simple: the people who make the decisions know little about these two types of training. They are convinced that yoga and Pilates are the best, mainly because other teams use them.

There are several reasons that yoga and Pilates are not the most effective means for developing a high-level major league baseball player. Yoga is essentially a method of static stretching for more flexibility and holding positions for more balance. But becoming more flexible and balanced in static positions does not enable you to become a better dynamic player, nor does it prevent injury. This has been proven in many recent well-documented studies. In fact, I am a firm believer that the excessive amount of yoga being done on these teams is one of the main rea-

sons that so many ballplayers become injured. (See Example 8 in the previous chapter regarding flexibility.)

Pilates can be an effective method of strengthening, but not for the reasons given by its advocates. For example, they create their own bull with statements such as, "Weight training tends to shorten the muscles, but Pilates lengthens them. All that lifting bunches up the muscles and makes them tight and stiff." However, the facts indicate otherwise. All muscles contract and shorten when they are activated, then lengthen when they relax.

If we were to believe that the with Pilates muscles become longer, the muscles would eventually become so long that they would develop slack, and you would hardly be able to move your joints. In addition, Pilates purports to offer more variety than weight training. However, weight training with free weights and machines offers many times more exercises and exercise variations. Pilates does not even come close.

One reason that coaches may have been picked up adopted Pilates is that, as some Pilates instructors claim," ... it realigns the body, corrects muscle imbalances and helps to heal injured backs. Weight training usually causes imbalances and overstresses the back." If the person using Pilates can develop individualized and progressive weight training programs, these programs may be used to correct balances and improve posture alignment. However, this has a lot more to do with motor education than merely strengthening the muscles. Poorly done Pilates and weight training can both be injurious.

The bottom line is that there are few, if any, methods that can develop spinal strength, power and stability better than a well-designed weight training program. Also, there is no scientific or clinical evidence that Pilates is better or worse than any other form of training for the average population. However, in the world of sports, Pilates training has never produced a world champion in any sport, nor has it been shown to offer superior muscular-skeletal development. Athletes who use Pilates may sim-

ply enjoy it and find that it suits them. But it doesn't mean they are performing better as a result of using this method.

On the highest levels, as the major leagues should be, it is important that the exercises duplicate as closely as possible portions of the total skill. This is needed to constantly enhance the skill together with the physical abilities. In this area yoga and Pilates fail. They can be good forms of general conditioning, but should not be continued into the season or used as key methods of training.

4. In pitching, the higher you raise the knee, the more speed you can generate in the pitch.

To determine the origin of this bull, it would be necessary to find out how the practice of raising the knee high began. Biomechanical analyses of many pitchers who raise the knee high show that they bring it up, bring it down and then stride forward. Thus for the most part, it is wasted movement. Studies have also shown that the amount of force applied to the ball is the same regardless of whether you start from the set position, as when a man is on first or second base, or with a full wind-up.

Some coaches disagree with this, as they have found that some pitchers have more velocity in their pitch when they raise the knee higher. However, in these instances there is also a change in technique. Many of the pitchers bend the rear leg more than usual and then extend the bent leg to push their bodies up and forward more strongly. This in turn helps to increase ball speed. They may also modify their pitching actions if the runner on base is extremely fast. In such cases they typically use a slide step to release the ball sooner, but more often than not the ball is thrown more slowly. It could, however, be thrown as fast in the same amount of time with specialized training.

Thus, to be teaching young pitchers to raise the knee high and spending time on exactly how much the knee should be raised is nothing but a bunch of bull. But this action is something coaches can easily see, so it is some-

thing they can work on. The actions they cannot see are much more important, such as the actions involved in the forward throwing motion prior to and during release. But these are typically ignored.

To get greater force in the pitch, it is essential to have a more powerful stride. This is the first action that generates force that can be added to the subsequent body actions, culminating in the release of the ball off the fingers. Analyses of many pitchers have shown that those who have a very high knee lift usually have a very weak forward drive. Those with a lower knee lift rely on a more powerful stride. The latter is thus more effective for generating greater speed on the ball and easier on the pitcher.

Pitching coaches talk much about ball velocity, deception and movement of the ball when discussing different pitches. However, they usually have not closely examined the different variables between different pitchers. For example, how much are they leaning to the side at the moment of release to change the point of release? Do they straighten their arm out to the side prior to release or do they keep the elbow bent a certain number of degrees to throw different pitches?

To be most effective it is well-known that different pitches should be thrown with different arm and hand positions and different wrist actions. There is no one universal point of release for effective pitches, especially in relation to the movement of the ball. Also not considered are the length of the pitcher's fingers, the amount of padding he has on the fingers (which enables him to get a better grip on or against the seams), the amount of forward trunk flexion there is, the arching of the back prior to going into the release, the amount of horizontal arm adduction after shoulder rotation, and so on.

5. Baseball teams use science to improve player performance.

This myth is related to the latter part of Example 4. The bull is usually thrown by sportscasters who follow the

teams and report on them. It comes up most often on sports radio talk shows and in comments made by sports writers in the newspapers. They maintain that the teams do biomechanical studies and video analyses of players when throwing and/or hitting. If this is true, why don't we see it practiced by the teams?

Some teams have done studies in these fields, but not analyses. Many pitchers have been filmed and quantitative data presented. For example, at a certain point in the throw the arm is held at a particular angle, the elbow is at another angle, the wrist is at a third angle, and so on. After all of this data is presented, nothing is concluded as to whether the pitcher is effective or not effective, and if so, why. They take it for granted that if it is a good pitcher, these are the data by which other pitchers should be evaluated. But this is erroneous, as every pitcher is an individual who throws differently from another pitcher. Thus, it is impossible to compare two pitchers with such data except in general terms.

Compounding the issue is when sports commentators use split-screen analyses to show the differences between a particular pitcher or batter and a successful pitcher or batter who is deemed to have good technique. Good technique in this case means a high-winning or hitting percentage, not necessarily an effective throwing or hitting action, although the two may be closely linked. Understand that every pitcher and batter should be evaluated or analyzed in relation to his physical stature, physical abilities, level of skill mastery, etc. For example, to compare a tall, long-limbed individual in the majors with a stocky, short individual in the minors can show great differences but mean little.

But even when differences are noted (when looking at the players technique from different years or in the same season), the question of whether a difference is significant, and whether the player should modify his technique to copy another player, is not answered on a scientific level. In many cases the player or coach does not have the

knowledge to accurately evaluate each joint action or know what should be corrected and how to make the corrections. Understand that making one correction can often take care of other problems at the same time.

Most often, rather than seeing practical studies, we find that teams have great videotaping and recording systems, but they are hardly used for scientific analysis. In the locker rooms, athletes watch videotapes of their performance with comments such as, "The next pitch is the one that I hit out of the ball park." It is not a frame-by-frame analysis with someone picking out the strong and weak points of the swing, throw or run and then making suggestions on how it can be improved. Thus, while teams do use some science, it is still in its infancy and has not yet been applied to player improvement.

6. You must know the sports jargon to understand what the coaches and athletes say.

This is a classic example of the bull that is handed out to cover up inadequacies in baseball and other sports. There is no doubt that some of the jargon must be understood, but typically the jargon is only a slang word for some other word. Any terminology that is explained should be clear enough for anyone to understand, especially a person who is not involved in the sport. However, it appears that most often the jargon takes on a life of its own and is used to disguise inadequacies rather than to truly explain a particular situation or aspect of the training or technique.

This is easily proven when you ask someone to explain by what they say. An example of this appeared in a recent San Diego newspaper article. A pitching coach, talking about one of his starting pitchers who gave up five runs in two-and-a-half innings and had an ERA of 6.38, stated that the pitcher " ... works on feel. He just has to get his release point back. As soon as he gets that back he will be fine. He's catching too much of the plate right now. When that happens you are going to get hit." But how is

he supposed to get the release point back? Does he not release the ball? Is he now releasing too soon or too late? Is he changing his arm position before or at release? These are very objective criteria that can be substantiated. Thus the statement that he works on feel does not hold water. It is not a legitimate explanation for his poor pitching.

We know there is feel associated with the execution of a skill. When the athlete develops his technique to a high level, there is a well-developed neuromuscular pathway which is recognized as a kinesthetic sense – or feel. It is experienced on every pitched ball. In essence, the pitcher learns what the pitch feels like. When he experiences a different feel, he knows something is wrong, and the pitch will usually not be a good one. However, the regular feel is quickly regained after several pitches. If not, then he needs film analysis of his pitching to determine what has changed.

Without an analysis there is no telling when a player will once again regain his form. Coaches wait for something to happen because they do not know what to do to help the athlete. As a result we are fed some good bull to explain the situation. Is this the role of a pitching (or hitting) coach? Is waiting for the player to change a good method for improving performance?

7. Coaches are interested in how players can be improved.

You may ask how a coach could not be interested in improving his players. Yet coaches are not interested, even though this should be a primary objective in coaching. Their main concern is how they can win, not how good they can make a particular athlete.

For example, a professional baseball player was sent to my protégé by his agent for speed improvement. The year before training he had seven stolen bases and three home runs. The season after training with the Yessis System, he recorded 35 stolen bases and seven home runs. It was his most productive season ever. However, rather than in-

quiring as to what had been done to improve his performance, the team instead sent him to a training facility supposedly designed for professionals. As a result, he became slower, got injured and then had a mediocre season the following year.

In another case, a professional baseball pitcher had some arm issues and excessive weight. After doing specialized training for three months, he had a career-high season with 18 wins and a 3.0 ERA. He also had the most innings pitched and the most strikeouts in one season. He made the all-star team and was a Cy Young candidate. However, his coaches were not interested in the specialized training program that resulted in such improvement. He did not come back the following year to make further progress in his training, and got hurt the next season. He finished with a 4-6 record and a 5.0 ERA.

Many more examples can be given to indicate how coaches rely more on jargon than science. They are not sincerely interested in finding out how to improve player performance even though they insist they are. Therefore, these statements can be nothing but B.S. Coaches would rather remain uninformed and stay in the well-established world of bull.

Chapter 4: Football-Specific B.S.

1. You must have an excellent time in the 40-yard dash to make the team.

A good 40-yard dash time has long been considered the golden standard for making a football team. If you are timed in 4.2 or 4.3 seconds, you are almost guaranteed to be selected by a team. The thinking among football coaches is that you can't take a good football player and make him fast, but you can take a fast athlete and make him a good football player. Thus, when they find someone with speed, they grab him at any cost. But this is bull.

What coaches fail to take into consideration is that most of the best players, especially running backs, defensive backs and receivers, need more agility and quickness rather than raw speed. This is the reason players such as Emmitt Smith, who ran a 4.7 when tested, was picked 17th instead of going high as anticipated. Yet, he was far superior to faster players picked before him for this position.

Typically ignored is that players rarely run in a straight line during a game. Thus, you can find many players who have a fast 40-yard dash time, yet are slow when it comes to playing their position. There are many players who have slow 40-yard dash times, but are some of the quickest players because of their stopping and cutting abilities. This enables them to be more successful in picking up short yardage and to still have successful long runs when they break free.

Although coaches swear that their hand times are accurate, if you compare the times of a football player who runs a 4.2 or a 4.3 to a world-class runner, the former would be faster than the fastest runners in the world. It has been proven that hand times are a far cry from being accurate, and if the coaches wanted accuracy they would use electronic timing. Doing this, however, would take away some mystique from their timing abilities and wouldn't allow them a cushion for fudging in order to make an athlete look better. Because of this, we will continue to see analysts timing players in under 4.3 seconds, a time faster than that posted by Ben Johnson in Seoul when he covered the first 40 yards in 4.39 seconds.

Even though football executives are burned by their selections when they look only at speed and/or general physical performance stats, the practice continues today even stronger than ever. This is why if a player wants to ensure he will be selected, he must work extremely hard to get respectable 40-yard dash times. There is just too much B.S. that has been built up over the years to enable young and upcoming athletes to break through the mold without the prerequisite speed.

Because of the bull surrounding the 40-yard dash, coaches have a tendency to ignore an athlete's playing abilities. Instead, they rely more on the numbers posted on the tests. For example, height and weight stats have become more important than playing performance. This is the reason draft selections are often major disappointments. For example, most receivers today are well over 6 feet tall and often over 200 pounds. Even when they see a "short" 5'11" or 6-foot receiver catch every pass against top defenders, they will not select him because he does not fit the established model.

2. The player is not fast, but he has good foot speed.

This is related to Example 1. The implication here is that the player is very quick. But neither foot speed nor running speed is related to quickness. The B.S. associated with this statement is that when a person takes very fast, short steps, he is quick and often fast. But this is bull mainly because quickness and running speed depend upon leg speed, not foot speed.

Speed is related to how quickly you can move the legs. Quickness depends upon the player's ability to change direction as quickly as possible while in motion. This means running a distance, often in a zig-zag manner, with speed. It does not mean taking 6- to 12-inch steps rapidly. In this case you have good foot speed but do not cover much distance.

The idea that a player needs good foot speed to be quick is also exemplified in many of the drills used by speed and quickness coaches. Most of these drills entail lifting the leg upward to step over a cone or in between ladder rungs or over hurdles, etc. Thus, the faster the athlete can move the leg up and down similar to a piston, the quicker the athlete will become. But this is erroneous.

Players do not become quicker from doing these drills; in fact, many of them become slower. However, the ability to raise the thigh up or down, as seen in the speed and quickness drills, may be of great benefit in running uphill or running stadium stairs. But these activities should be used for aerobic and anaerobic conditioning, not for developing quickness.

For quickness you must do exercises to make the hip joint muscles more powerful. This includes exercises such as explosive front and side lunges with Active Cords and low-to-the-ground plyometric jumps such as leaping, bounding and single leg side jumps. Even more importantly, the player must learn how to execute sharp cuts. Once mastered, he must then develop the physical abilities to execute the cuts as quickly and powerfully as possible. This is all very possible, especially with good players. However, we continue to see very few excellent, quick players, not only in the pros but also in collegiate play.

3. The 3-point stance is best for linemen.

In the early days of football, linemen assumed a 4-point stance (both hands and feet in contact with the ground). But as football became quicker and faster, linemen went to a 3-point (one hand, two feet) stance. The need for this stance is reiterated every year, and many exercises (such as exploding from a 3-point stance dragging weighted plates) and pieces of equipment (such as driving and hitting sleds) have been devised to improve movement out of this position.

Coaches believe that linemen drive forward from the 3-point stance to make contact with their opponent. However, except on goal-line defenses, this is bull. If it were true, we would see more linemen lying on the ground after they make contact. Instead, we see linemen standing and pushing one another up around the shoulders and chest, rather than at the waist or below. Game films prove without a doubt that linemen first stand up and then move forward or in some other direction. They do not stay down when they make contact. Yet the bull is so strongly entrenched that coaches still teach driving forward from the 3-point stance on almost all plays.

When I discovered that the first thing linemen do is stand up, I contacted several football coaches and relayed this information to them. Several wanted proof. When I showed them game films of professional teams as well as their own team in play, they could not believe this was true. Their reply was that they were doing it incorrectly, and that they should drive forward from the 3-point stance. They refused to accept the fact that linemen did not do this.

As a result, when told it would be more effective for linemen to assume a 2-point stance, coaches were even more adamant this was false. But being in a 2-point (hands off the ground) stance raises the center of gravity, enabling players to get higher and to move out of position faster. If the other team still insisted on using a 3-point stance, they

would be able to come down on their opponent, overpowering them with relative ease. However, the accepted bull is so strong that the 3-point stance is still considered the standard for linemen and most backfield men.

It is interesting to note, however, that more and more players are beginning to assume a 2-point stance, but not always on every play. They are learning through trial and error that this stance allows them to get into action faster and to execute plays more effectively. Thus, it seems players often learn more efficient movement on their own, without relying on coaches.

4. Coaches do specialized training for different playing positions.

On the professional level and at most major Division I colleges, teams have individual coaches for just about every position. For example, you can find a special teams coach, a line coach, a defensive backfield coach, an offensive backfield coach, a quarterback coach, a kicking coach, the head coach and offensive and defensive coordinators. Having a large number of coaches implies that the team (or the game) is so highly specialized that it requires specialty coaches for the different positions. But even when the coach deals with only one aspect of the game, he still does not get involved in player development. This is where the bull lies.

Understand that most of these coaches essentially pass down to the team players what they learned in their own experiences. Most of it revolves around strategy and what the player should do in particular situations. In some cases there may be some instruction on how to do something, but it is typically cursory at best. As a result, coaches' specialized training may be good for developing overall playing strategy and it may contribute to building a winning team, but it does little if anything to improve player abilities. This crucial aspect is typically ignored. Instead of improving a player's skill performance, the coaches will in-

stead buy or trade for another player to fulfill their objectives.

There is virtually nothing scientific done on these teams to improve performance, especially in relation to game-specific speed, quickness and power — three very important physical qualities that all football players should possess. Most often teams emphasize general strength and muscle mass, especially for linemen, but the training is general. What they typically fail to grasp is that you can train athletes to perform specific skills and functions for their playing positions.

It is well-proven that players can be trained physically and skill-wise so they can execute all of the functions of a particular playing position. As a result, they will then be capable of carrying out any and all assignments. But if the player is given a task and does not have the skill or physical abilities to fulfill it, he will not be able to carry out the coach's strategy. Thus, coaches do themselves a disservice by not looking at the potential for player improvement, but instead looking only at the player's performance when they buy or recruit him to fill a particular position.

5. You can't be fast if you weigh over 280 pounds.

The bull associated with this statement may be a little outdated, and the weight may be different, but the main concept still holds true. Coaches believe that a player who is heavy cannot also be fast. When they select linemen who weigh between 300-500 pounds, they look for someone who is good at blocking or tackling, rather than someone who is quick and can maneuver in any direction quickly and powerfully.

This bull behind weight and speed started many years ago when the ideal lineman was considered to be about 280 pounds. If you were over this weight, you could not be fast. To show how deeply entrenched this belief was, I must relay the story of a rookie who played for the then Los Angeles Rams in the early 1980s. This athlete was

already extremely strong, was brought to me for quickness and explosive training. He weighed 352 pounds and stood between 6'4" and 6'5". After approximately seven weeks of training, he lost 25 pounds and posted 255 pounds of lean muscle mass at a weight of 325 pounds. This is more muscle than we have ever seen on any other athlete. In testing done by the team, he was equal, if not superior, to all the other linemen (who weighed around 280 pounds) in the 10- to 20-yard dashes and in the agility test.

He was so powerful, he was able to leap up onto a table from a push-up position. In team practices and scrimmages, he hit so hard his teammates asked him to ease up. He was obsessed with playing and it took two players to slow him down. Coaches who watched him in practice marveled at his abilities and were united in their beliefs that he would be an awesome player.

However, when the season began, this athletedid not play. When players and coaches asked the head coach why the athlete was not playing, his answer was, "You cannot be fast if you're over 280." As a result, the athlete became demoralized and the nonplaying ended his career. It wasn't until the 1990s when William Perry (The Fridge) played for the Chicago Bears that it became acceptable to have players weighing over 280 pounds. However, Perry's capabilities did not come close to those of the athlete I have been describing. Perry was a great player, but could have been even better.But Perry did open the door for heavy players who now dominate the line on high school, collegiate and professional teams. However, they usually don't have great quickness or speed.

There is some indication that the trend may return to speed. One of the top winning teams has been drafting for speed and now has no tackles over 300 pounds. If they continue their winning ways, other teams are sure to follow in their footsteps. However most teams still go for size. For example, 15 years ago 39 players weighed in at 300 or more pounds. In 2005 there were 338 players

over 300 pounds on opening day rosters and 552 in the training camps. Concern now is for the health of the players, as there have been several deaths attributed to their overweight conditions.

The key I hope coaches will soon understand is that you can have size, speed and quickness once you have the know-how to develop their abilities. The knowledge and practical work are available, they just need implementation.

Chapter 5: Basketball-Specific B.S.

1. You cannot increase jump height.

This is a well-ingrained belief originating with the idea that all skills are natural. That is, you are born with the ability to jump high, and no one can change this. On the extreme limits this is a true statement. You can only improve your jump height as much as your genetic capabilities (and training) will allow. Thus, the greater the percentage of white explosive fibers that the player has, the more he or she will be capable of increasing jump height. However, having too great a percentage of white fibers can be a negative trait in basketball play, as you would not be able to go all-out for extended periods.

Regardless of genetic makeup, everyone must develop and strengthen the explosive abilities of the muscles to the optimum level in order to jump as high as possible. This means not only developing the white explosive fibers that are mainly responsible for jump height, but also the intermediate and the slower white twitch fibers. Strength coupled with muscle mass as commonly developed is not the key element. If you look closely at most basketball players, you will see that the calf and to a large extent the thigh muscles, which play a very important role in jumping, are not well hypertrophied. In general, they are relatively thin, but they are explosive.

Thus, the key to improving or increasing jump height is not only to increase strength, but to literally convert strength to explosive power. This is done through the use of true plyometrics and other forms of explosive training.

With effective training it is possible to take a good player at the high school or collegiate level and improve his jump height three to six inches on average. Younger or lower-level players can improve even more.

Much bull about jumping is perpetuated by companies that advertise various devices and gimmicks to improve jump height. For example, increasing the height of the area under the ball of the foot by two or more inches to create a greater stretch of the Achilles tendon and calf muscles can produce greater jump height, but when such devices are no longer used, the athlete typically returns to where he was jumping previously. The key to more height is to train effectively to develop the strength and explosive power of the muscles. Without this preparation, players can easily become injured and see false improvement from using various jump devices.

2. In shooting, the elbow points to the basket with your body in a forward-facing (square) position.

The bull regarding this recommendation began many years ago by shooting coaches. As the players became taller, it became more difficult to shoot successfully with the elbow pointed at the basket. The elbow had to be raised in order to shoot over the extended arms of the opponent. Keeping the elbow in line with the basket resulted in blocked shots. Rather than using the push pattern (elbow pointed at the basket) in which there is elbow extension together with shoulder joint flexion, most shots are now executed only with elbow extension with the wrist coming into play at the end in both variants. Only youngsters and players with weak arms and shoulders must still use the push pattern to shoot the ball.

The idea that the body should be square to the ball is pure B.S. It is impossible to get the elbow and ball in position with the eyes in the same line looking at the basket from a front-facing position. It creates the "chicken wing" position in which the elbow flares out to the side when

you bring the ball in to line up with the eyes. To effectively shoot the ball, you must be at a slight angle with the body to the ball, in a less open position. If you look at just about any good shooter on a collegiate or professional level, you will see this is how they execute the shot. In a slight side-facing position, the ball can be lined up with the eyes and elbow on the same plane to the target.

3. The player has good hang time.

If you listen to the commentary during basketball games and to coaches talking about players in general, you will invariably hear that a particular player has great hang time. In other words, he is capable of staying in the air longer than other players. This is a great myth, since "staying in the air" has nothing to do with the player but everything to do with gravity and the laws of nature. In a jump, once the player is airborne, gravity immediately begins to decelerate the body at the same rate regardless of who he or she is.

After reaching the peak of the jump, based on the amount of force applied to the ground and the ensuing acceleration when rising upward, gravity takes over and the body begins to slow down, then stop and drop. It accelerates downward at the same rate of speed, and with the same gravitational forces acting on the body, regardless of the player. The body can only go up and then immediately come down. It does not stay in one spot at the peak of the jump for any extended period of time.

You may, however, get the illusion that someone stays in the air longer if he has a much higher jump. The player going higher is in the air longer, and thus may appear to remain or be high for a longer period of time. Most likely a coach or announcer made this observation and other people in the basketball world just accepted it as something factual without questioning it. This is how bull is propagated very quickly and, in time, becomes accepted as truth.

4. The player is not fast, but he has good foot speed.

The implication here is that the player is very quick. But neither foot speed nor running speed is related to quickness. The bull associated with this statement is that when a player takes very fast, short steps, he is quick and often fast. But this is a myth, mainly because quickness and running speed depend upon leg speed, not foot speed. This example also appears in the chapter on football B.S. Because of its prevalence in basketball, and since it plays such an important role in player development, it is also included here. For a more in-depth analysis, see Example 2 in Chapter 4.

Chapter 6: Running-Specific B.S.

1. Long-distance runners should land on the heel and then rock forward on the foot to push off.

This long-held belief has been passed on for many decades. However, from film and biomechanical analyses of runners, we now know that landing on the heel is not only incorrect but also causes injury. When you land on the heel, especially when running at the present long-distance marathon pace, the forces experienced can be up to 10 times the runner's body weight. If the body is not capable of withstanding these forces, the runner breaks down with an injury at the ankle, knee, hip or even the lower back.

If the foot lands close to or under the body, there are less braking forces for the body to contend with. But pick up a running magazine such as *Runner's World*, and you will see that almost all of the pictures show runners landing on the heel. Shoe companies extol the virtues of their shoes by advertising that there is more cushioning in the heel to allow runners to land in this incorrect manner.

Many coaches still believe in the heel hit and continue the bull with statements such as, "This creates a longer stride," or "It is more relaxing to the runner," or "It is the way top runners run." They surround themselves with this misinformation so they do not have to face reality and teach their runners to run more efficiently and safely.

In many cases, coaches believe this to be an efficient and natural way to run. But this is a myth. If left alone,

each runner will develop his own running style, which may be economical, but probably not effective. The reason for this is that the runner's technique will be based on his present level of coordination and physical abilities, not on what he may be capable of doing after specialized supplementary training.

Even though the heel hit is usually associated with long-distance runners, the bull has permeated sprint running and can be seen in many major collegiate and professional sports. It is not uncommon to see 25 to 50 percent or more of the players on baseball, football, basketball, soccer and lacrosse teams using the heel hit or a shortened stride with mid-foot touchdown. This is not an exaggeration! To see this you must first film the players at a shutter speed of 1/100 of a second or more and then watch the tape frame by frame. The eye cannot see the foot action clearly when viewed in real time. This is one reason that this major technique error continues to go unnoticed. Since most coaches usually don't correct or try to improve technique, this finding has not had much impact on player improvement.

2. You should lean forward when running.

The bull originating with this statement probably started with coaches looking only at sprinters, especially after they first start their run. However, we now know that when in full stride, regardless of running speed, runners should have an erect body position to allow for more effective leg actions. The more you lean forward, the more you constrict your ability to have free-flowing forward and backward thigh actions and breathing abilities.

When accelerating, however, it is necessary to lean forward. The forward position places your center of gravity slightly in front of your body, which forces you to move your legs faster in order to maintain good balance. However, acceleration cannot be maintained for an entire race. Sprinters accelerate for approximately the first 25-30 yards.

After this they are in full stride, at which time their bodies should be erect.

3. You push off by contracting the glutes and hamstrings.

This belief has been perpetuated for so long that it is almost sacrilegious to say it is not so. Yet it is impossible for these muscles to propel the body forward in the push-off. There are two reasons for this. First, when your foot comes in contact with the ground, you undergo flexion in the ankle, knee and hip joints. Thus, the gluteus maximus and hamstrings are stretched during the support and push-off phases. These muscles could not be involved, even if the leg first straightened and then pushed backward. To do this you would create excessive vertical forces, and you would still not be able to actively engage these muscles.

The hamstring and gluteus maximus muscles are active only from the moment the thigh is in front of the body to the moment the thigh is directly underneath the body. It is impossible to bring the leg behind the body with the pelvis and upper body stationary. Understand that the hip flexor muscles and the hip joint ligaments are relatively tight and do not allow the leg to go behind the body.

Thus, when the leg does go behind the body, it is because the pelvis is rotating forward while the glutes and hamstrings hold the position of the thigh and hips stable. An indicator of this is the arching in the lower back during the push-off. The glutes and hamstrings may feel tight and tense, but it is an isometric contraction to hold the leg-pelvic girdle relationship. As a result, the force for the push-off comes from ankle joint extension.

4. Runners need carbohydrate drinks to run long distances.

This statement is true only for runners who keep replenishing their carbohydrate stores to maintain the run. Even though many studies show that runners can run

longer by doing this, few have questioned whether this is the most efficient way to run.

Understand that as you start running, your energy levels are usually high, but after a while your body begins to burn different fuels. Initially you utilize a fair amount of the sugars (carbohydrates) that are present in the body from the stores of glycogen. Once you have depleted the sugars, your body turns to burning fats.

But if you constantly take in carbohydrate-type drinks, energy bars or gels to replenish the carbohydrate stores, your body will not be trained to utilize the fats in the body. Fats are not automatically burned for maximum efficiency. You must train to adapt the body to burn of fats by running close to your anaerobic threshold. This is where you can get the greatest breakdown of fats that supply much more energy than carbs per unit of use. Keep in mind that it is mainly through training to utilize more fats that you are able to run longer and faster.

The fact that the body relies greatly on fats to fuel your running is so obvious that it has been greatly overlooked. In the fitness literature, it is well recognized that if you wish to lose fat, you must work out longer and at a faster pace. As a result, your body utilizes the fat for energy and you lose the fat stores. But I am always amazed at the diets recommended for runners. They contain mostly carbohydrates and very little fats. Note that for many women and some men carbohydrates lead to greater fat and weight gain!

Because of the high carbohydrate diet, it is not uncommon to find runners who are very thin with hardly any muscle and practically no fat stores. Runners who have an extremely high carbohydrate diet with minimal fats train the body to run on carbohydrates as the main fuel and not on fats, which are so much more efficient. This can also explain what happens when they "hit the wall" after running a long time. They simply run out of carbohydrates and do not have sufficient fat stores for the body to use to supply the energy.

5. Runners must stretch before running.

Some runners will tell you this is bull. They never bother to stretch, yet they run very effectively and safely. Starting off slowly and gradually increasing speed until you are at your running/training pace has proven to be a most successful formula for initiating and maintaining a run.

But because the stretching bull has been repeated so often for so many years, most coaches maintain that you should always stretch before running. The static stretching that is typically recommended does not prepare you for running. Nor does it help to prevent injury. In fact, static stretching can cause injury. For example, one of the most common stretches done by runners is the straight-leg toe touch. This exercise can overstretch the ligaments of the lower back, which in turn creates a looser spine, more prone to injury. This is a proven fact. There is no reason to do static stretching prior to beginning a run.

To prepare the muscles for running, especially sprinting, runners should do active stretching. This includes active limb and body movements to get the muscles working and warmed up prior to beginning the run, especially at a faster pace. (See Example 8 in Chapter 2 for more information on stretching.)

6. You must pump the arms faster to run faster.

The arms play a very important role in running, but not the role usually assigned to them by most runners and coaches. According to their bull, when you pump the arms faster in a forward-and-backward motion, you will be able to run faster. In reality, however, the faster you pump the arms, the more uncoordinated you will become, especially if the arms are not synchronized with the legs.

When they are synchronized with the leg action, the arms play a very important role in improving speed by maintaining a stable upper body with little twisting. This enables you to have direct forward-and-backward movements of the legs, which are the key to faster and more

effective running. The forward-and-backward movement of the arms helps to keep the shoulders in place which in turn helps to hold the hips in place, so they do not rotate sideward.

If the shoulders are not stable, you may find the left hip moving forward around an axis in the middle of the body when the left leg goes forward, and the right hip rotating forward when the right leg is driven forward. To counteract these movements, the right shoulder and the right arm come forward, the left hip rotates forward to go across the body, and the body holds on a straight forward path. The same happens when the left arm and shoulder come forward to prevent the right leg from crossing over, and allow for more direct forward movement of the thigh. However, there is always slight movement of the thighs toward the midline of the body, as well as some shoulder rotation. It is impossible to hold the shoulders and hips in a perfectly stable (nonrotating) position. To help do this it is necessary to strengthen the abdominal oblique muscles with exercises such as the reverse trunk twist and the Russian twist.

The key to effective arm movements is to be sure they are synchronized with the leg movements. This is the most important factor, because the arms by themselves will not increase speed. They must be in perfect synchronization with the legs to allow for full stride length and optimal stride frequency. If you move the arms faster than the legs, it will throw off the synchronization. This will interfere with your running technique, and you may slow down rather than speed up. Initially, faster arms may give you the sensation of speeding up, but it will only take a few strides before you find yourself becoming discombobulated.

Chapter 7: Golf-Specific B.S.

1. The slice is caused by an outside-to-inside swing.

In theory, if the clubhead is moving on an outside-to-inside pathway as it makes contact with the ball, it will put sidespin on the ball and create a slice. Superficially, this makes sense. However, there is a major flaw in this thinking. You cannot swing outside-to-inside without falling over after you swing. It is physically impossible to swing outside-to-inside and still maintain your balance after you take the swing. This is why this statement is bull.

The bull regarding the outside-to-inside pathway is so strongly entrenched that it is almost impossible to find any issue of major golf magazines such as *Golf Digest* and *Golf Magazine* without an article addressing this topic. Pros rate this problem as one of the most serious among amateur golfers. In addition, many other negative outcomes of hitting the ball outside-to-inside are noted, such as pulling the ball sharply to the left creating a severe draw, or simply hitting a straight ball off to the left because the swing forces you to open up the body and overrotate. But again this is all bull.

To prove that the outside-to-inside swing exists is very simple; you only need pictures taken from videotape or film. Instead of doing this, the experts continue to print opinions without showing real, unposed pictures of a swing executed by a golfer who slices. The bottom line is that if you cannot show it or prove it, then it probably is B.S. Opinions are fine when they are based on fact or

substantiated data, but when opinion lacks substantiation, they are feeding us bull.

2. The secret to a powerful hit lies in the backswing.

There is more bull generated about the backswing than any other aspect of the golf swing. Golfers are constantly told how to bring the club back, rotate the shoulders and/or hips to the rear, cock the wrists, how far back the clubhead should go, where the clubhead should face, the number of degrees of rotation, etc.

It has gotten to the point where instructional editors and teaching pros are so convinced the secret to a good swing is in the backswing that they rarely look at other phases of the swing. They may say that the downswing and follow-through are important, but the bull surrounding the backswing as the key to hitting the ball well is too overwhelming.

It is easy to show why this is bull. All you have to do is assume a particular stance holding the club up and back, then swing down to hit the ball. This means the key to getting distance on the ball is your downswing. All your movements in the backswing are preparatory. You can take the backswing, stop and hold, and then begin the swing and get basically the same result.

Most likely, pros do not look closely at the downswing because it happens too quickly. The eye cannot see what happens in the downswing, but it can see what takes place in the backswing because it occurs so much more slowly. Thus, teaching pros have a tendency to spend more time dealing with motions they can see, rather than what they cannot see. This becomes even more evident if they also do not understand what occurs during the downswing. To understand requires trained biomechanical analyses with explanations, something that is beyond most pros even though the information exists. Thus, we get more bull.

Getting additional distance in the downswing is related to two things. First is the amount of weight shift you have. Second is the strength and sequence of the hip rotation, followed by shoulder rotation and then the arm and wrist action. Careful observation shows that all of these actions happen in sequence, and they all contribute to a culmination of force at the moment of impact.

The downswing has more actions than the backswing, and each one plays a very significant role. When these actions and their sequence are not understood, instructors shy away from dealing with them since they are unable to explain what happens and why it happens. This is another example of instructors teaching what they think occurs, not what actually occurs. Because you are a great player, it does not mean that you understand or even know what you do! See Example 4 in Chapters 1 and 2.

The common lack of understanding also helps explain why five different teaching pros each might tell you something different to fix to in order to improve your swing. Most of it can be classified as bull. As Frankfurt says, "The production of B.S. is stimulated whenever a person's obligations or opportunities to speak about some topic exceed his knowledge of the facts that are relevant to the topic."

3. If you have a good backswing and start the downswing with the arms on plane, the wrist break will happen naturally.

This is bull because not a single action happens "naturally" in the execution of a sports skill. There are some cause-and-effect reactions, but this is not one of them. For example, the wrist break must be a very powerful action. It is needed to maintain the speed of the clubhead as the club shaft approaches a straight line position with the left or forward arm. Understand that when you increase the length of a lever (in this case from the shoulder to the clubhead), the speed of the club arm lever decreases.

However, because of the increase in the length of the club arm lever, you have greater force produced in the clubhead. When you begin the downswing, the club shaft is at a 90-degree angle or less to the arms because of the wrist cock. The lever in this case is only the length of your arm, from the shoulder to the hands, so that you can swing the club down faster. But increasing the lever arm by uncocking the wrists does not increase the speed of the clubhead as we typically hear.

Thus, the key to a successful hit with great distance is not so much increased speed of the clubhead, but increased force of the clubhead when it contacts the ball. This is why many golfers use a longer club. It creates more force for driving the ball farther. Using a shorter club or choking down on the club results in shorter distance. In both cases the wrist break must be powerful to get a straight line lever from the shoulders to the clubhead at contact.

Even more bull is associated with the wrist break. You will find all too many golf instructors talking about wrist flexion and extension. This does not occur in an effective swing. The wrist action is ulna flexion in which the little-finger sides of the hands move toward the forearm. To flex and then extend the wrists would be painful, and perhaps injury producing, if executed forcefully.

There is even more bull regarding the rolling of the arms or forearms, which is considered part of the release. This action follows the ulna flexion. Once the club shaft and arm are in a straight line, the arms roll over to bring the face of the clubhead square to the ball. For this to happen, however, the wrist break action must be powerful. If it is weak, the clubhead will lag behind the hands and the club face will remain open, resulting in a slice. This is probably the main reason that many golfers slice the ball.

Many instructors also state that the wrist break is natural if you have the wrists cocked in the backswing. However, this is not a natural consequence. It must be initiated with strong muscular contractions. In fact, all the downswing actions must be initiated with force in a specific

sequence to generate maximum force at impact. For example, when the shoulders rotate forward before the arms accelerate via muscular contractions to produce greater force. If the arms started before the shoulder turn from a stationary position, for example at the top of the backswing, they would not be able to generate as much force.

4. The hands and arms start the downswing.

This is commonly heard from golf professionals who believe the swing is controlled by the arms and hands. On some occasions you may find a pro stating that the entire body works as a unit so the lower body and arms begin simultaneously or the hips initiate the swing. It is the latter group that is correct if you want to generate maximum force and distance. The hips must always lead in the sequence of events that occur when executing an effective swing. This is also true in other sports that require hitting.

There are several very important reasons for this. First, when you shift the hips forward you create a force that is then added to the sequential body actions. This force equates to greater distance at contact. Close examination of all top professional players will show that the very first action is weight shift. Understand that the hips are where your weight is considered to be concentrated. Thus, when you put your hips in motion, your body is now active and generating force. The hip slide or weight shift is one of the key actions for clearing the hips, which also involves hip rotation. The weight shift moves the hips forward, so that when you rotate the hips, you have a longer hip lever to create even more force. If you rotated the hips with your weight equally distributed between both legs or still on the rear leg, you would have much less force.

By merely shifting your weight forward you can create tremendous force. For example, falling down is a weight shift. When you hit the ground, it can be quite painful, and even cause injury. The more weight you can move,

the greater the amount of force generated. This is why golfers who have significant mass usually hit the ball much farther, especially when they execute weight shift. This is also seen in most long-ball hitters who have tremendous weight shift.

When the hip rotation is coupled with the force from the weight shift, it is then transferred to the shoulder rotation. The shoulder rotation then contributes its own force to the already generated forces, which are then transferred to the arms and so on. This sequence of actions culminates in what is known as a summation of forces. The force generated by each action is added to the total and then transferred to the next adjacent joint action so that you get a gradual buildup of force culminating at ball contact.

After the hip slide it is important that you rotate the hips first and then the shoulders. When you do this rotation separately, the shoulders can also make a major contribution to the production of force. If you rotate the hips and shoulders simultaneously, you will generate only slightly more force than with a hip rotation alone, and but not the maximum that is possible if separated. When the hips go first they stretch the abdominal oblique muscles so they can contract with greater force to rotate the shoulders.

Initial weight shift and forward hip rotation are key actions to a safe and effective swing. Not only do they set you up to create the most power in the swing, but they also allow you to do all the following joint actions in a smooth, coordinated manner. You will also be able to execute an explosive swing without fear of injury to the spine.

There are many more examples that can be given here but I hope these suffice. For more information I recommend *Explosive Golf* in which all of the actions are fully explained.

Chapter 8:
Conclusion and Recommendations

Some of you may be tempted to argue that this book perpetuates more bull. I say, let's get it all out in the open! Let's have an open, truthful discussion of these topics. Let's back up our discussions with videotapes, photos and training data. Let's educate coaches and athletes. This should help eliminate much of the bull in sports and enable athletes to improve their performances. Then we can truly develop the potential of our youth and present-day athletes.

Another way to accomplish this goal would be for coaches, athletes, sports writers and commentators to learn about sports technique and how it can be improved with scientifically based training. This could take place when an analysis is done of a football, basketball or baseball game. Typically the analysis covers only the strategy involved. That is good and should be included, but it is also possible to bring in a quick analysis of a player's performance.

For example, if a quarterback executes a great pass or a pitcher throws a 100-mph fastball, it can be replayed frame by frame with a biomechanics analyst to bring out the key actions executed by the player that made it so effective. A total analysis would not be needed at this time. The only elements discussed would be the key actions that were executed that are typically not included in the throwing motion. Or it could be some action the player strongly relies and does exceptionally well in every throw. Past experiences show it is different for most players.

If it is an analysis of a running back, the viewer should learn why he is successful in his run. The analysis would show his cutting actions, bringing out the strong and weak points of the cut so there can be better appreciation of what these athletes do, or should do, in game play. As a result, the athlete, coach or viewer could incorporate some of these findings into his or her training. In addition, coaches would have an opportunity to learn more about what is involved in effective technique and how it is executed.

In baseball, cameras could be set up to show the side and front views of a pitcher. Then the main aspects of his throwing technique could be analyzed. Understand that all pitchers throw somewhat differently. They rely on different body parts for the production of speed as well as control and accuracy. A camera behind home plate can show his point of release. The side view can give us a better idea of what his body actions are and the precise arm and wrist actions. The same can be done with golfers.

Analyses of running can be done in most sports. For example, how does a baseball player get into the run to first base after hitting the ball? How does a player run to get a ball or to get past his opponents? Is his running effective? Can it be improved? Can he be made faster or quicker? These are things that can be brought out in the analysis with specific examples of what can be done to improve performance. Coaches may time the players in their runs, but they don't know how to help them get faster. With these analyses they can learn what can be done to improve player and team play.

With such analyses we could also eliminate some of the bull that is typically heard during the game as well as in the post-game analysis. These after-game analyses and interviews with players typically revolve around comments such as, "The other team executed better than we did," or "The boys were playing well today," or "The players didn't make any mistakes," or "They came through in the

clutch," or "The team was really motivated." These comments are all well and good, but they do little to analyze player performance or improve the players' ability.

At present, our teams are not concerned about what can make the players execute skills more efficiently. For example, if the players played well in one game, what did they do differently when they did not play well? These are objective findings that can be determined to answer this question. There is much room for technical analyses that can be productive and help athletes and coaches. The analysts, however, would have to be experts in the field, and at this time, finding such people may be difficult. It will be this way for long, once more interest is generated in true player development, and we train people to do this.

More instructional books written by experts in collaboration with coaches are needed. The books should contain very detailed information that is easy to understand by anyone reading the book. In this regard we should also have more DVDs or other types of media to accompany the instructional materials.

In universities, instructors should be brought up to date so they can begin teaching more practical information, especially in regard to athletic training. Perhaps there should even be special advanced coaching curricula and special seminars for updating coaches and professors in different sports.

Doing this might not be simple, since many coaches and university professors will be reluctant to change. However, appealing to young, up-and-coming coaches and professors would be a great way to introduce these changes. When coaches and athletes begin to see the positive benefits of such changes, there will be a much greater demand for better coaching and more effective teaching. This, in turn, will force the more reluctant people into change.

Recommended Reading

To assist coaches and parents in helping their athletes become more proficient, I recommend, *Build a Better Athlete: What's Wrong with American Sports and How to Fix It.* This book extensively covers all the major skills needed by athletes and shows how they can be developed.

The chapters on running, jumping, throwing, hitting and kicking contain sequence pictures of the skills executed by different athletes in different sports. Included are guidelines on how the skills should be executed. There is also an analysis of the technique and strength exercises that help improve performance in these sports.

The chapters dealing with strength training, speed and explosive training, endurance training, agility, quickness, flexibility, balance, posture and vision are probably the most up-to-date and extensive you will find in any sports book. The chapter on nutrition contains the latest information and can assist greatly in eating habits, diet and supplementation.

When you read the chapter on performance-enhancing drugs you will find they are not the key to improving your performance. In addition, the training program is one of the most extensive, covering many different facets of training and how they can be integrated into an effective program. By reading this book and assimilating the information, you will be able to truly develop players and improve player performance.

This book should be available from your favorite book retailer. If not, contact Sports Training at (760) 480-0558, or visit the website www.dryessis.com.

For more sport-specific technique analyses and training practices read *Explosive Golf, Explosive Basketball Training, Explosive Running, Women's Soccer: Using Science to Improve Speed, Explosive Tennis: The Forehand* and *Explosive Tennis: The Backhand.*

About the Author

Dr. Michael Yessis is President of Sports Training, Inc. a multi-faceted company specializing in biomechanical/kinesiological analyses and sports-specific training. Dr. Yessis is Professor Emeritus, California State University, Fullerton and clinic advisor and a member of the editorial board for the American Running Association.

Dr. Yessis has developed many unique sports-specific exercises and specialized training programs to improve technique, strength, flexibility, power, speed and quickness. His training program, now known as the Yessis System of improving performance, consists of biomechanical analyses and the creation of specialized exercises that duplicate what the athlete must do in execution of his sports skills. He has been a training and technique consultant to Olympic and professional sports teams, such as the L.A. Rams and the L.A. Raiders football clubs, U.S. Men's Volleyball Team and athletes from youth to the professional level.

Dr. Yessis received his Ph.D. from the University of Southern California. He was the first to show the relationships between muscular strength and endurance in his research. He taught on the university level for over 35 years in the areas of biomechanics (technique analysis), kinesiology (muscle and joint movements) and exercise science. In addition, he was Editor-in-Chief of the *Fitness and Sports Review International for 30 years.*

Dr. Yessis was a featured columnist for *Muscle and Fitness* magazine for over 20 years, and his column "Muscles in Motion" was the number one rated article in the magazine. He is a regular writer for *Volleyball Magazine* and *Womens Basketball* and has written well over 2,000 articles, 15 books and four videos in the sports and fitness fields. *Explosive Running* and *Kinesiology of Exercise* are among the top sellers, and his latest books *Build a Better Athlete: What's Wrong with American Sports and How to Fix It and Sports: Is it All Bulls%*&* will be released this year.

Dr. Yessis has made guest appearances on many TV shows, including the Today Show, Good Morning America, Eye on San Diego, Sports Page and CNN News. He has also been written up in many newspapers and referred to in many journals, including *Sports Illustrated, Sport, Time, People, San Diego Union,* and *North County Times.*