

B.E.S.T. or Better?

When Claudia and I recently took our Level 4 Coaching training from the USA Archery (formerly the NAA), the focus of the entire training was on the Biomechanically Efficient Shooting Technique, or the B.E.S.T. method. This is understandable because the author of the B.E.S.T. method, KiSik Lee, was recently hired as the USAA's national coach. This method was first made available in Coach Lee's book, Total Archery (reviewed in AFM, Vol. 9, No. 3), and subsequently in a series of seminars and trainings by Coach Lee. The entire first day of the five day Level 4 Coach training was devoted to a presentation on the B.E.S.T. method by Coach Lee. Major parts of the rest of the program also focused on this method.

The acronym is unfortunate because even Coach Lee insists that it is evolving continually. In this article I intend to see how revolutionary the B.E.S.T. method is, or rather how evolutionary.

In the Beginning

I have books on archery form going back 450 years. Up until recently virtually all of them espoused the author's opinions/biases based on their personal experience with little attempt to justify them. Here is an example:

"A very common defect is in drawing with the right hand too low. Never suffer yourself to shoot with the right hand below the top of the right ear."

from "The Modern Archer," 1878

It must have been challenging to shoot a York Round this way as the author goes on to say the

point blank range for a fifty pound longbow using his technique was 26 yards!

The first inkling I can see of any effort to take a more scientific approach was in the early 1980s and the only one who wrote about form extensively was Rick McKinney. Now, when I mention Rick McKinney, I assume you associate him with his best-selling book, *The Simple Art of Winning*. Actually, I will refer most often to an earlier book, *The Confident Shot*, which was published much earlier. This book was simultaneously published in English and Japanese by Yoshi Komatsu. (Yoshi is the publisher of Archery magazine in Japan and a founder of this magazine.) *The Confident Shot* resulted from a series of interviews of Rick McKinney at Arizona State University in 1983.

We will see McKinney also making claims based on what he thinks works, but also he tries to provide a rationale for what he recommends. He also refers to efforts to measure his muscle responses and reaction times made in Japan and by the USOC.

The B.E.S.T. method

I have neither the space nor the expertise to write with authority about the B.E.S.T. method. (I have extended an open invitation to Coach Lee and to many others to do so and I hope to provide you with definitive information later.) What I intend to do is to highlight a number of points clearly delineated in Coach Lee's book and seminars to see how innovative they are. I have chosen

some of these topics according to how much “buzz” or interest there was in my Level 4 Coach training. (A number of the coach trainees were High Performance Coaches who were specifically being trained in B.E.S.T. to provide information on it throughout the country.)

Some Comparisons

String in Hand and Hand at Anchor In *Total Archery*, the bowstring sits in the fingers just ahead of the first joint of the index finger, behind the second joint of the middle finger, and ahead of the first joint of the third finger. (I am not sure about the position of the string on the first finger as Coach Lee also emphasized making a deep hook on the string—really wrapping the fingers around it—and I am not sure these two ideas are compatible.)

Coach Lee argues that the back of the draw is not to be perpendicular. Having the string slightly angled on the hand allows it to rest along the jaw with greater contact making a firmer anchor.

In *The Confident Shot*, McKinney is quoted as saying, “The line of the string fingers isn’t at right angles to the arrow, if you shoot with a hook behind the first joint in the top finger and past in the bottom.”(page 50). On page 53 there are pictures of McKinney and Darrell Pace at anchor, with their hands along their jaw bones, not strictly under in a classic “side” anchor.

Line The basic aspect of good archery form of “having good line” has been around for a long time. Consider this quotation:

“If you twist the string awry, even in the smallest degree, or hold your bow so nearly vertical that the shaft falls away to the left, or *hold your right elbow so that the forearm makes an angle with the arrow*, or keep your right hand too far from your face, *you cannot shoot in the line of your aim.*” (italics mine)

from How to Train in Archery by Maurice and Will Thompson, 1879

And the Thompsons give credit in their writings to the great archers who came before (Horace Ford in particular) and from whom they learned.

Considerable amounts of the B.E.S.T. method are designed to provide alignment at full draw in which the draw elbow is swung past the point of being exactly in line with the arrow. The advantage of getting past that point is, because of the normal variation from shot to shot, if you start behind line and are a little off, you will never be short of the arrow line. If your form ends with you being exactly in line, sometimes you will be behind and sometimes outside of that good alignment. Being

outside of the arrow line leads to plucking (see my article, “Pluck, Pluck, Pluck” in Vol. 10, No. 3) a major cause of large groups.

To accomplish this ideal alignment in the B.E.S.T. method, the draw is made slightly downward, then the string hand is brought up to anchor. Also shoulder muscles are activated to get the draw side shoulder blade (*scapula*) down and back. This prevents the shoulder blades from blocking each other and restricting the arc through which the draw elbow can be swung.

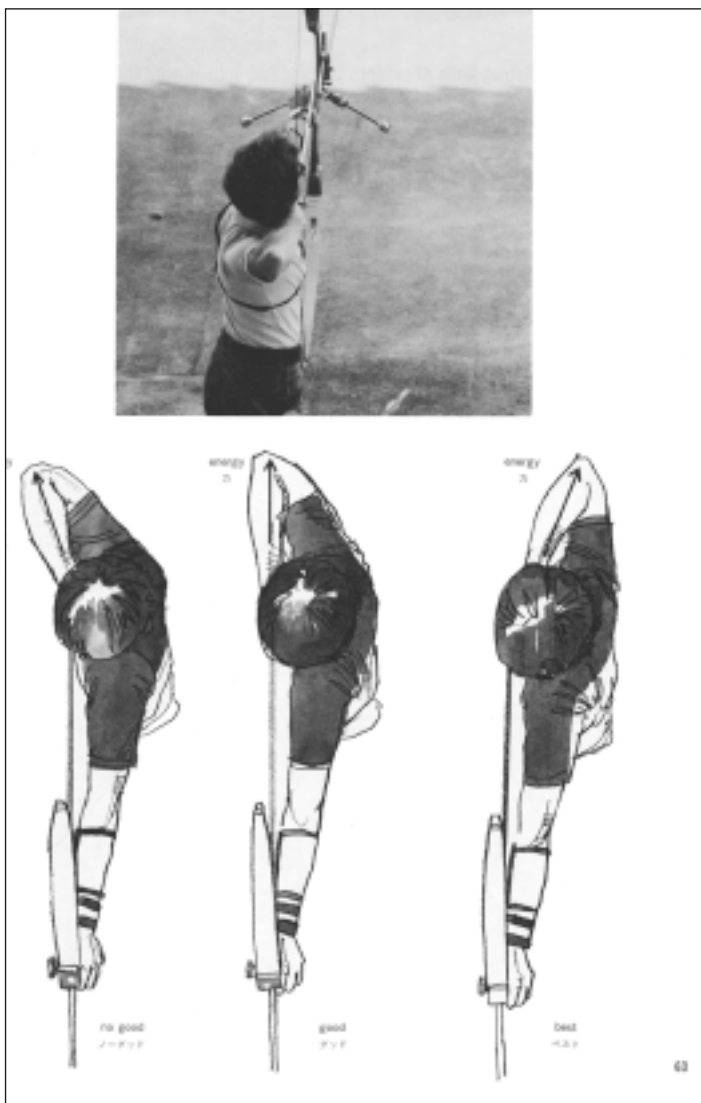
McKinney stated much the same thing (see the facsimile of page 63 of *The Confident Shot* on the next page). The top photo clearly shows McKinney’s elbow several inches past alignment with the arrow. The diagrams below are “Good,” “Better,” and “Best” with “Best” being as demonstrated by McKinney above. McKinney thought, at the time, that he had an advantage of having longer forearms and shorter upper arms which allowed him to do this more easily than others. Subsequently measurements indicated Rick is no different from the norm in that respect. So, how did he get so far past “basic line?”

My best guess is that Mr. McKinney was striving for as much advantage as he could get. There are two ways to get high energy shots (once a bow design has been selected): draw weight and draw length. Rick was shooting as much as 51 pounds in hand when he won his World Championships. More draw weight was unlikely to be controllable. Not being particularly tall, though, his draw length could be lengthened if he were to lean back somewhat, which I believe he did. Getting as much draw length as possible results from swinging that elbow back as far as it will go. A lot of stretching and practice are required to get there, though.

Leaning backward (away from the target) is not optimum form. But remember Rick was shooting aluminum arrows with vinyl vanes and 7% NIBB points at the time. If he had had Easton ACEs available in the same spine range, he could have added 30-40 grains to the point and still had an arrow 60-70 grains lighter than his Easton X7s. More on this later.

Back Tension Coach Lee emphasizes not just the use of back tension but tension using the lower and middle *trapezius* and not the upper traps. Use of the upper traps restricts the range of motion, not allowing the draw elbow to get behind line. McKinney is quoted (on page 70), “I have many times undergone a muscular test. It is very interesting that all of the tests produce the same result . . . a certain muscle works well with much more

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A facsimile of page 63 of *The Confident Shot*. The diagrams at the bottom are labeled (left to right) "no good," "good," and "best" and the photo at the top shows Rick McKinney characteristically with his draw elbow inside of the arrow line.

tension in comparison with other archers. That's the trapezius." and "... if you would like to try, I would recommend you to use the middle and bottom part of the trapezius. The top must not be used."

Bow Shoulder In the B.E.S.T. method, the bow shoulder is stabilized by using the *latissimus dorsi* supported by a flexed *triceps*. This locks the shoulder down and reduces the range of motion of the shoulder joint and, hence, increases its stability.

McKinney is quoted as saying (page 68), "The *serratus anterior* stabilizes the bow, attaching to the bow arm at the base of the shoulder." The *serratus anterior* is the

muscle just under the *latissimus dorsi*.

McKinney's bow arm is considered by many to be his strongest asset. A photo, on page 71 of *The Confident Shot*, shows his shoulders tilted with his left shoulder higher than his right. A pronounced acromial notch in his bow shoulder shows good structure otherwise. I believe that if Rick McKinney had his own carbon arrows to shoot, or ACEs or X10s, his shoulders would have been level as is being recommended now. Light, stiff, carbon arrows have done much to help elite archers achieve more repeatable form and execution.

Evolution, Not Revolution

There is much in the B.E.S.T. method that is different from current teaching. The comparisons above were meant to indicate that much of what is in it was anticipated by others.

So what is new? A great deal, but as I have indicated much is nuanced (with the exception of the phase of the draw where the load is transferred to the back in such a way to allow the draw elbow to get behind the arrow line) and represents small differences in what is going on. Coach Lee's genius lies in having proven that this method is teachable. His success in Korea is indisputable. But many people look at the Korean system as one in which a great many elite archers undergo ferocious competition, resulting the best of the best being very good indeed. Coach Lee took his system to Australia and the result was medals in both the Olympics and World Championships. Australia did not have 500 elite archers waiting for him when he arrived.

Also, Coach Lee is at the forefront of those arguing that archery has to be more scientific. If there is a better way to shoot and it can be proven, why would anyone do anything else? Coach Lee is so committed that he continues to experiment and make changes based on what he learns (see the sidebar "Lies, Damned Lies and Statistics"). The biggest experiment is resident in the hiring of Coach Lee. Prior to that, the entire American system of Olympic archery was athlete driven. The new system is coach driven. We are all eagerly awaiting the results. If the energy and enthusiasm of the Resident Athletes at the Chula Vista Olympic Training Center are any indicator, we should expect good things.

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Lies, Damned Lies, and Statistics

If we in the archery community are going to get better at addressing archery scientifically, then we need to get better at understanding statistics. The title of this sidebar is from another Mark Twainism and it refers to the ability of statistics to be used to confuse and obfuscate. Statistics in themselves are neutral; it is the interpretations we make of them which are always suspect. For example, “98% of the prisoners on death row ate peas and carrots as children. Why we still serve peas and carrots to our children, I don’t know.” Just because there are coincidents (“on death row” and “ate peas and carrots”) doesn’t mean they are connected. There must be a mechanism in order for there to be a connection between the two.

An archery-related example comes from Coach Lee’s website (www.kslinternationalarchery.com which is well worth checking out, by the way). He shows the average scores on 12 arrow rounds over the years he was coaching in Australia. In order to get to 12-arrow rounds, you have to be very good and very successful, and this is where the pressure really mounts in international target archery (You are getting close to winning!). Three of the four highest average scores are by Australians, coached by Coach Lee. The point he makes is “his take on archery form and execution holds up under pressure.”

Well, maybe. There is a great deal else I would want to know. For example, how many rounds does each average represent—it is easier to get a high average with few rounds than with many. How many of these rounds were against other people in the top 10 on this list (a gauge of the level of competition)? I could go on but just consider how many statistics are flashed on your television screen during a football or baseball game. People have been arguing for years over what baseball statistics actually tell you about the players and there is now a whole branch of sports statistics devoted just to baseball! In the list of Coach Lee’s, I am inclined to accept his conclusion (provisionally) because the time span was

long (six years) and the likelihood of Australians dominating that list before he came around was almost nil. But I would prefer a better set of standard statistical comparisons.

Another example comes from Total Archery. On page 130 (of the first edition) he describes an experiment in which three elite archers were asked to shoot two sets of three arrows through a chronograph in, first, a 2.5 minute time period and, then, a 30-50 second time period. The results showed a range of chronographed arrow speeds for all six arrows for the generous time period to be 7 fps, 7 fps, and 4 fps, but for the very short time period, the ranges were 1 fps, 1 fps, and 2 fps. The conclusion: shooting quicker results in greater consistency. This is an excellent piece of work. I would like to see this experiment repeated with more archers to answer the question, “Is this a general behavior of all archers or just these three?” Additionally, if this is general, what is the optimum number of seconds per shot? Is that optimum the same for all archers or is there a range? Can an individual find his own optimal rhythm this way?

The point here is we have done very few experiments on archers and published very little of the results. It takes a considerable amount of time to set up and do these experiments, but if the results of such experiments were communicated, someone else might be inspired to do the followup work. This is how science works.

And, as always, the statistics must be picked apart to find the connection between the “cause” and the “effect.” So, what is the connection between shooting quickly and consistency? It is suspected that the less time there is to think, the less time to make mental mistakes (over aiming, etc.). We think. . . .