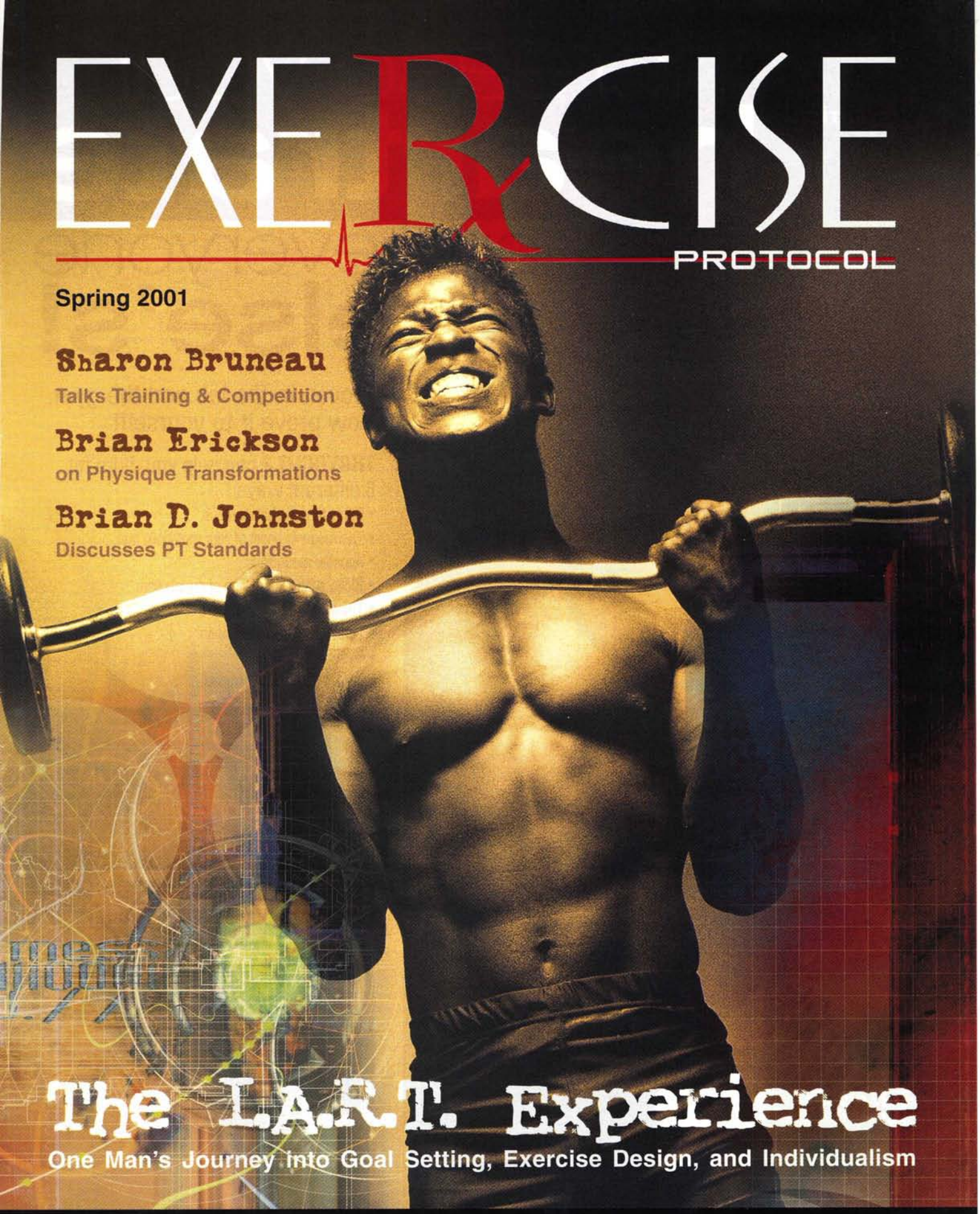
EXERCISE PROTOCOL

Spring 2001

Sharon Bruneau
Talks Training & Competition

Brian Erickson
on Physique Transformations

Brian D. Johnston
Discusses PT Standards



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The RoundTable

It has been suggested that a person can reach their ultimate (muscular) genetic potential in one year. Others, conversely, have suggested one can increase muscle mass for several years, with an average gain of 5-10 pounds a year. What is your opinion on these statements?

BRIAN D. JOHNSTON

The ability to reach an ultimate genetic muscular potential literally means that; the ultimate, with no further room to grow. Although I believe it is possible, the number of elements that make it possible - that are responsible to allow such to happen - are quite extensive. And to have all of these elements in an ideal balance and optimally in tune is high unlikely. Consider age, that if a person is too young, his maturation and testosterone levels will not be high enough to allow ultimate growth until a few years later. Conversely, a much older individual, e.g., 50+, who first begins exercise may not have the ability to train hard enough to produce dramatic results than someone relatively younger. Then you have to look at the motivation factor, a good eating program and, most importantly, an appropriate/ideal exercise routine. Everyone is constantly looking for the perfect program, which can only be found through experimentation and possibly several months or even years of trial and error. It can hardly be discovered within one year... or at least it would be a rarity.

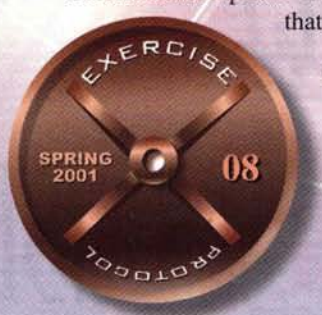
I also do not believe that it is possible to gain lean mass for several years, particularly averaging ten pounds or so each year (unless on anabolic steroids). If it takes years (although I'm uncertain how to quantify 'years'... perhaps fifteen years, for example), then the program would be far from ideal. A good program will produce most lean muscle mass within a few years at most, with paltry gains thereafter. If, after 2-3 years of training, you were to gain a further ten pounds of lean tissue, it would be that much more difficult to gain another ten pounds the following year. It only stands to reason that the closer you come to your genetic potential, the less you can progress, and the harder it will be to gain. In effect, it will be impossible to match what you achieved the year before... unless the 'new' program is that much better and the 'old' program was that bad. But that argument is irrelevant since it reflects the quality of the training program, based on an individual's choices, and does not account for genetic limits and adaptative regulation.

MATT BRZYCKI

Whether or not individuals can reach their ultimate muscular (and strength) potential in one year, or average significant gains for several years, has a number of compounding variables. The following variables affect the developmental potential of previously untrained individuals and, therefore, must be considered prior to making any valid statements about potential gains:

- Individual genetic response – Those who have inherited certain favorable musculoskeletal, mechanical, hormonal and neurological characteristics will have a greater potential for increasing their muscular size (and strength) more quickly (and, ultimately, to a greater degree) than those with less favorable genetics. (These characteristics include a high percentage of fast-twitch muscle fibers, long muscle bellies coupled with short tendons, high levels of testosterone, mesomorphic tendencies, low points of tendon insertion and an efficient neurological system.)
- Age – After about the mid 40s, a person's potential for increasing muscular size (and strength) decreases with age. In other words, younger individuals will be able to increase their muscular (and strength) more quickly (and, ultimately, to a greater degree) than those who are older (everything else being equal).
- Gender – In general, males will be able to increase their muscular size (and strength) more quickly (and, ultimately, to a greater degree) than females (everything else being equal).
- Caloric consumption – In order to reach their muscular (and strength) potential, individuals must consume a well-balanced diet that features an adequate amount of calories.

Having said that, I think that everyone can reach their ultimate muscular (and strength) potential as quickly as possible by using a program that allows for sufficient recovery, provides adequate caloric intake and incorporates the foundational principles of high-intensity training. Further, previously untrained individuals can expect to increase their muscle mass (and strength) for several years in an amount that is a dictated by the aforementioned variables.



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KEN MANNIE

The overriding variable in the rate and level of strength and morphological enhancements via strength training is genetic potential. Matt addressed all of the critical constituents that comprise this all-important, inherited element in his answer. Contrary to what the popular muscle magazines avow, everyone is not capable of "adding three inches of muscle mass to their arms in 28 days," regardless of the program being promoted.

In a recent conversation with Dr. Ted Lambrinides, it was noted that in a study he conducted there was an approximate gain of 7 lbs. of lean body mass with a concurrent loss of 4 lbs. of body fat. In his study, twenty-two males (ages 18-35) participated in eight weeks of high-intensity strength training. Please note: This was properly executed high-intensity strength training, not the facade that is so often passed-off as being high-intensity strength training by scientists who are more concerned with advancing their agendas than the fastidious administration of the scientific method. Now, how long this level of gains can be maintained is the next question. Certainly, there will be an eventual leveling-off. However, it is not uncommon for our athletes to gain 20 pounds or more of lean weight with a year of training.

Yes, it is a product of hard training, good nutritional and lifestyle habits, etc., but we must always revisit the genetic makeup of the individual for the real answers.

RICHARD WINETT

An examination of training studies with average men and women and some aggregation of these data in text books indicate that most people are not that responsive to training as far as increasing muscle mass and that gains in muscle mass appear to peak out at about 12 to 18 months of training. However, the average gain in strength is quite good with increases in strength of about ~30% to 60% after only several months of training. Thus, it's quite possible that if a person starts training when they are physically mature, that indeed they may add most of the muscle mass they will ever add after about a year of training. There can be some increases after that point, but the increases are likely to be small. The parts that haven't been talked about much in most muscle magazines is that the increase in muscle mass for most people may not be that much and that after about 18 months of intelligent and dedicated training, it appears hard to add more muscle mass for most people.

There's interesting anecdotal evidence, albeit from short-term training, that also supports this position. If you carefully examine the "before" and "after" pictures of many of the winners of a self-improvement contest promoted by another magazine, you will find that these people did make dramatic physical transformations. However, the process usually involved greatly reducing body fat and, to a much lesser extent, adding some muscle mass. It's also important to keep in mind that these people are probably the most responsive to training out of the tens of thousands of people who enter these contests. There's an important take home message here. Most people are not capable of naturally adding a very large amount of muscle mass and becoming huge. The people who can are a very, very small percent of the population. A more realistic, healthier and saner set of goals can involve getting a lot stronger, adding some muscle mass, and focusing on lowering body fat and presenting a lean appearance. (Visit Richard's website at http://ageless-athletes.com and check out his newsletter *Master Trainer*).

GREG BRADLEY-POPOVICH

One problem in a hypertrophied cell, like muscle cells enlarged through resistance exercise, is that messages can no longer efficiently get to and from the brain of the cell (the nucleus), whose job is to direct protein synthesis. This limitation is described by a ratio sometimes called the nucleus-to-volume ratio (aka DNA unit or nuclear domain), which recognizes that a nucleus can reliably sustain only so much cell. One of the body's solutions to this problem is simply the addition of more nuclei, which occurs in skeletal muscle cells through the enlistment of nearby satellite cells that are developmentally leftover muscle precursors.

Satellite cells are one genetic determinant of strength-training adaptation that we may actually be able to alter. For one, anabolic steroids (which I do not endorse) appear to stimulate satellite cell division, and creatine may possess this quality as well. Also, I hypothesize that physical activity during puberty—when anabolic hormones are highest and satellite cells are very responsive—may have the same result. More satellite cell activity would mean greater fusion of nuclei with muscle cells, the end result of which would be more nuclei to direct protein synthesis and to maintain a more favorable nucleus-to-volume ratio. It is exciting to think that we may be able to, in a sense, alter our own genetics!

So, to finally address the original question posed to the RoundTable, I propose that some individuals may rapidly reach their genetic ceiling within a few years while others who are either blessed with or pharmacologically induce an unusually high number of satellite cells may progress for a more prolonged period of time owing to increased ability to sustain and augment large muscle cells. But, in practical terms as Mr. Universe Mike Mentzer has advised, genetic potential can be properly assessed only in retrospect.