

11-2015

Shifting Gear: A Historical Analysis of the Use of Supportive Apparel in Powerlifting

Jan Todd

Dominic G. Morais

Trinity University, dmorais@trinity.edu

Ben Pollack

Terry Todd

Follow this and additional works at: https://digitalcommons.trinity.edu/busadmin_faculty

Part of the [Business Administration, Management, and Operations Commons](#)

Repository Citation

Todd, J., Morais, D. G., Pollack, B., & Todd, T. (2015). Shifting gear: A historical analysis of the use of supportive apparel in powerlifting. *Iron Game History*, 13(2-3), 37-56.

This Article is brought to you for free and open access by the School of Business at Digital Commons @ Trinity. It has been accepted for inclusion in School of Business Faculty Research by an authorized administrator of Digital Commons @ Trinity. For more information, please contact jcostanz@trinity.edu.

SHIFTING GEAR: A HISTORICAL ANALYSIS OF THE USE OF SUPPORTIVE APPAREL IN POWERLIFTING

Jan Todd, Dominic Gray Morais, Ben Pollack & Terry Todd

The University of Texas at Austin & Trinity University, San Antonio, Texas

In many ways, powerlifting is an odd sport. Competitors do not run or jump; no balls, bats, or rackets are used; and only one competitor “plays” on the lifting platform at a time. Judging can be highly subjective; three judges intently watch as the athlete lifts the loaded barbell nine separate times over the course of the competition. There is no instant replay and most lifts take less than ten seconds to perform. At the end of the lift, each judge throws a switch; if at least two white lights appear, the lift is good; if two or more lights are red, the lift does not count. Three squats, three bench presses, and three deadlifts constitute the nine attempts of a powerlifting contest. At most, lifters spend ninety seconds “competing” during what is generally a day-long contest.

Uninitiated audience members who find themselves at a powerlifting meet will probably view watching such a meet as an exercise in endurance — their own, not the lifters’. In truth, it is not a great spectator sport; meets tend to run slowly, often lasting an entire day. Further, little is done by meet promoters and announcers to help the audience understand that they are actually watching not one but dozens of contests playing out simultaneously as lifters compete based on age, weight class, drug use status, level of experience, and, increasingly these days, on the basis of what kind of “gear” they wear to perform their lifts.

In powerlifting, the debate over appropriate gear — by which we mean the various types of supportive wraps and clothing worn while competing — dates to the earliest days of the sport, and has had a profound influence on the present state of powerlifting. Among the most significant aspects of the sport’s fascination with what we define as “PEG — Performance Enhancing Gear” — is the role it has played in the fragmentation of

the sport into several dozen sporting federations, and the willingness of many of these national governing bodies to allow various levels of gear-assisted lifting in their organizations. If sport philosopher Robert Simon is right that, “sport” is nothing more than a group of rules that define and delimit how the central contest of the sport is to be enacted by participants, then powerlifting, by virtue of having many different sets of rules, may not be one sport — but many.¹

Interest in the impact of technology on sport performance has been explored in other sports like swimming and track and field. However, scholars have paid little attention to technology in powerlifting.² This is not surprising given the fact that powerlifting is not part of the Olympic family, and that it remains in the eyes of most a “minor sport.”³ Nonetheless, the history of gear in powerlifting bears consideration for the future of sport. Our hope is that by describing the history of gear from our insider’s perspective — all four authors competed in the sport.) — we can lay a base for other scholars who might wish to explore this topic in the future. We begin, therefore, with a discussion of the kinds of gear currently in use, follow that with a history of the evolution of supportive gear in powerlifting, and conclude with a brief analysis of the impact of gear on records and performance in the sport.

One of the questions driving this research is why various powerlifting federations have reacted to the new technological changes in gear in so many different ways. Track and field, for example, uniformly adopted flexible fiberglass and carbon-fiber vaulting poles in the 1950s, just as modern tennis rackets — with their 40 percent larger heads, 30 percent lighter weight, and 300 percent greater stiffness — have become standard at all levels of tennis.⁴ No one plays with wooden rackets any longer, and no pole-vaulter of note still uses a bamboo pole. Powerlifting, however, runs the gamut from essentially “anything goes,” to no supportive gear, and has not

Correspondence to: Dr. Jan Todd, NEZ 5.700, Dept. of Kinesiology & Health Education, H. J. Lutchter Stark Center, University of Texas at Austin, 78712. Email: jan@starkcenter.org.

adopted a single paradigm for legal equipment as most sports do. What we find particularly fascinating is that this paradigm of “virtually limitless freedom” encourages multiple forms of the sport to occur simultaneously during “a” contest.⁵

As Jan and Terry Todd point out in their essay, “Reflections on the ‘Parallel Federation Solution,’” after American powerlifters decided to organize both “drug-permitting” and “drug-free” federations in the 1980s, other powerlifting federations formed, and were able to create their own rules covering matters such as doping, the performance of the lifts themselves, and appropriate gear. The multiple-federation approach described by the Todds means, however, that the accolade “record holder” is now meaningful only within the context of the federation in which the record was set as there are too many differences in the rules of these disparate federations to compare lifts in any meaningful way.⁶ In September 2015, for example, according to the website PowerliftingWatch.com, there were 33 different powerlifting federations operating in the United States and nine different international federations.⁷ Although many of the rules used by these federations are similar, and in some instances are exactly the same, there are also stark differences from federation to federation – which have caused some federations to acquire a reputation for having much higher records than other associations. Consider for just a moment, the possibilities lifters have to set records in the different divisions sanctioned by the American Powerlifting Federation (APF). The APF, originally formed in 1982 by powerlifter Ernie Frantz, began as an association for lifters who wanted the freedom to take anabolic substances if they wished and to not be subject to drug testing.⁸ The APF now sponsors three kinds of competitions based on the gear permitted — open, single-ply, and raw. In order to have a larger membership, they also offer what they call “non-tested” and “amateur” divisions. The term “amateur” in this instance refers to an athlete who chooses not to use performance enhancing drugs. It has no connection to the traditional meaning of amateurism and whether that person earns money from his or her sport.⁹

As Table 1 demonstrates, the APF has embraced the use of gear technology wholeheartedly in its open division, placing no limits on the layers or kinds of fabric permitted in the “suits” worn while lifting. In the “Single-ply” division, however, lifters may wear supportive suits made with only one layer of fabric while the “Raw” divisions is for those athletes who choose to compete

wearing only a non-supportive singlet, belt, knee sleeves rather than knee wraps, and wrist wraps. This means that in one APF contest there could be *six* different men (or women) all of whom are lifting in a single weight class — who could set an American record because the APF recognizes: open geared, open one-ply, open raw, amateur geared, amateur one-ply, and amateur Raw divisions. If masters, submasters, juniors, and teenage age divisions are also considered — the number of records possible in one weight class becomes even more outlandish. The APF recognizes 14 age subdivisions plus its regular open division. If those 15 divisions are multiplied by the six categories offered to accommodate different kinds of gear and drug-testing, 90 different men, or 90 different women, could legitimately claim to be an “American Record Holder” in each lift or the overall total in one weight class in the APF.¹⁰

Gearing Up for Powerlifting

Before continuing, a brief explanation of supportive gear is necessary for those unfamiliar with the sport. All federations require lifters to appear on the platform in a “lifting suit.” A single-ply suit (made of one layer of fabric) generally resembles a wrestling singlet but with wider straps and mid-thigh length legs. Raw lifters wear stretchy wrestling or Olympic weightlifting singlets generally made of nylon, polyester, or spandex knit that are non-restrictive if sized properly; they provide no additional support to the lifter. Raw lifters also normally wear one suit for the entire meet.

Geared lifters, on the other hand, change their costume for each lift. In the squat, they wear what is now generically called a “super suit,” made of stiff, heavy material that restricts the lifter’s natural movements and helps the competitor lift more weight. At the bottom of the squat, the suit works like a compressed spring, helping the lifter reverse direction. Researchers have theorized that energy is stored in the fabric during the descent and that the farther the fabric stretches the more it will help the lifter reverse direction. When the suit reaches the point at which it cannot stretch further, a rebound effect helps the lifter come “out of the bottom.”¹¹ The suit also provides support to the lifter’s back, abdomen, and “core” muscles, which must stay contracted to hold the body erect and thus carry the great weights lifted in “geared” powerlifting.¹² However, while both one-ply and “open” competitors can be said to wear super suits or squat suits; the strength of the materials used; the cut-

ting and sewing of the fabric in certain ways; and, most importantly, the number of layers of fabric used is dramatically different in these two divisions. Open competitors have no real limits on the number of layers of fabric they can gird themselves with when they squat.

Inzer Advanced Designs, owned and operated by former powerlifter John Inzer, is a leading source of multi-ply suits in the United States. Inzer sells the most expensive squat suits on the market with his

“Leviathan” and new “Leviathan Pro,” both priced at \$385 in 2015. On his website, Inzer explains that the original Leviathan is the “King of the Squat Suits, worn by the Kings of the Squat.” The ad then points out that “The Leviathan is a suit of armor that literally stands on its own.”¹³ Inzer has gone to great lengths to create special fabrics and methods of construction that can enhance a lifter’s performance. The Leviathan, for example, uses what Inzer calls a new “canvas hybrid.”

Table 1. American Powerlifting Federation Divisions

(Derived from Official Rule Book: World Powerlifting Congress, 2014 Edition)

Competitive Division	Supportive Bench Shirt & Undershirts	Supportive Lifting Suits for Squat and Deadlift	Supportive Briefs	Belts and Wraps	Drug Testing
Open	Unlimited layers of fabric; Polyester, denim or canvas permitted; Open backs permitted, Velcro strapping permitted. Undershirts may be worn in benching and squatting and these may also consist of multiple layers of fabric.	Unlimited layers of fabric; Polyester, denim or canvas permitted; Open backs permitted; Velcro strapping permitted.	Briefs permitted and may be made of multiple layers of any fabric.	Wrist wraps permitted in all lifts; Elbow wraps permitted in squat and deadlift only; Knee wraps of 2.5 meters in length permitted; Knee sleeves permitted; Belts permitted. <i>Knee wrap length is longer than many other federations.</i>	None
Amateur	Unlimited layers of fabric; Polyester, denim or canvas permitted; Open backs permitted; Velcro strapping permitted. Undershirts may be worn in benching and squatting and these may also consist of multiple layers of fabric.	Unlimited layers of fabric; Polyester, denim or canvas permitted.	Briefs permitted and may be made of multiple layers of any fabric.	Wrist wraps permitted in all lifts; elbow wraps permitted in squat and deadlift only; Knee wraps of 2.5 meters in length permitted; Knee Sleeves permitted; Belts permitted. <i>Knee Wrap length is longer than many other federations.</i>	Urinalysis
Open Raw	Not permitted, T-shirts only.	Single-ply, non-supportive singlet only	Not permitted	Wrist wraps permitted in all lifts; No knee or elbow wraps.	None
Amateur Raw	Not permitted, T-shirts only.	Single-ply, non-supportive singlet only	Not permitted	Wrist wraps permitted in all lifts; No knee or elbow wraps.	Urinalysis
Open “One-ply”	Single-ply polyester shirts allowed, must have closed backs and no Velcro strapping.	Single-ply polyester fabric squat suits permitted.	Single-ply polyester briefs permitted.	Wrist wraps permitted in all lifts; Elbow wraps permitted in squat and deadlift only; Knee wraps of 2.5 meters in length permitted; Knee Sleeves permitted; Belts permitted. <i>Knee Wrap length is longer than many other federations.</i>	None
Amateur “One-ply”	Single-ply polyester shirts allowed but must have closed backs and no Velcro strapping.	Single-ply polyester fabric squat suits permitted	Single-ply polyester briefs permitted	Wrist wraps permitted in all lifts; Elbow wraps permitted in squat and deadlift only; Knee wraps of 2.5 meters in length permitted; Knee sleeves permitted; Belts permitted. <i>Knee wrap length is longer than many other federations.</i>	Urinalysis

His advertising promises: “50-70 pound increases and more are regularly reported over conventional squat suits of the past.”¹⁴

Not surprisingly, the wearing of such highly engineered suits now means that the heaviest squats ever performed in six of the 11 men’s weight classes (198, 220, 242, 275, 308 and Superheavy-weight) are all over 1000 pounds. In fact, the heaviest squat on record (as of October 2015) is 1267.7 pounds (575 kilos), made by Jonas Rantanen of Finland in October 2011. Rantanen weighed 303 pounds (137.4 kilos) on the day he made this lift, and it is actually heavier than the superheavyweight record, held by the then 380-pound American Donnie Thompson, who managed 1265 pounds (573.8 kilos) in 2011.¹⁵

While waiting for their next attempt, single-ply- and multi-ply-wearing lifters usually sprawl and lean back in chairs, unable to sit normally because of the tightness of the suits and the rigidity of the fabric. As the time gets closer to their turn on the platform, helpers begin wrapping the lifter’s knees with long, elasticized wraps used to provide compression and add yet more rebound in the bottom of the squat.¹⁶ The last steps in preparation before the lifter heads to the platform are fitting the tight straps over the shoulders and tightening the thick, heavy belts common in powerlifting. It can take several people, who sometimes use pliers, to pull the suit straps over a lifter’s shoulders because the fabric is so stiff and the fit is so tight. This is painful to the fingers of the helpers, and so special “fitting gloves” are available these days from powerlifting supply companies that advertise such gloves will, “Save your fingers when handling and fitting gear on workout partners or yourself!”¹⁷ Inzer also launched a new kind of suit, called the Leviathan Pro, to help make getting into the suit easier. This multi-layered suit’s top half is made in sections and once the straps are over the shoulders, long laces — similar to those in a corset — draw the suit tightly around the torso, and a zipper closes to increase and secure the tightness of the fit.¹⁸



The two largest suppliers of powerlifting gear, Titan Support Systems and Inzer Advanced Designs, both sell a variety of levels of supportive gear to powerlifters. At the extreme ends of their offerings are the double-ply Titan Super Fury shirt with its closely set sleeves, and Inzer’s Leviathan squat suits that are so stiff and virtually unyielding that Inzer advertises the “Leviathan Stands On Its Own!”

For the bench press, the second lift of the contest, most “equipped” lifters remove their tight-fitting squat suit, replace it with a lighter singlet, and then don a bench shirt crafted to function in much the same manner as the squat suit. The bench shirt looks somewhat like a tight T-shirt from the front, but some models now have an open back and use large Velcro straps to hold the shirt in place on the body. Bench shirts also provide a spring-like effect, storing energy during the lowering of the bar and then releasing that energy after the bar touches the lifter’s chest and the upward push begins.¹⁹ Within the geared segments of the powerlifting community, most lifters believe that once the lifter learns how to use a bench shirt, and how to choose the proper size, wearing the shirt helps them lift more weight. A female powerlifter, for example, reported in a chat room, “My raw bench is 175 lb. I recently benched 240 lb with the Fury.”²⁰ On that same page, a male lifter explained that with “double denim” he bench pressed 369 pounds, and that with double-polyester he hit 480. His best “raw” bench, he explained, was only 315 pounds for two repetitions.²¹

The question of fabric for both bench shirts and suits is particularly important as the various elastic and tensile qualities of the fabrics used, and the innovative methods of construction, are analogous to the fine-tuning and types of engines seen in various forms of auto racing. All cars, for example, will have some form of a piston engine, but depending on the kind of race (Formula One vs. NASCAR, for example) they will be made of

very different materials and tuned — as well as constructed — very differently.²² In powerlifting, fabric technology and suit design play a similar role. Titan Support Systems works constantly to find ways to improve the strength of their squat suits and recently “invented” a fabric called “NXG Super Plus” that they advertise as “the strongest, heaviest fabric in the lifting world.” Titan goes on to explain in their ads, “. . . we didn’t stop there. We also included our patented built in harness system. The 3-cm seams create an anatomically precise harness system for extra support and bigger squats.” This is not all, however. “Not enough? How about state of the art, hi-tech, hi-tensile strength threads that hold incredible loads — up to 10 kg of weight per single looped thread! Then we put that thread to use by incorporating more stitching per square inch than any other suit in the lifting world.”²³

In addition to squat suits, knee wraps, and bench shirts, many lifters also wear a specially designed deadlift suit, wrist wraps, belts of varying thickness, and powerlifting briefs (which in reality, constitute an additional supportive layer for the squat).²⁴ Deadlift suits may resemble squat suits in general appearance but the fabrics used are less stiff and lifters generally agree that

the amount of help they provide is partly dependent on how one deadlifts. Some lifters place their arms inside their legs and their feet widely apart, thereby shortening the length of the pull in what is called a “sumo” deadlift. Conventional deadlifters place their feet only about hip-width apart and place their arms outside their legs when they begin the lift. Although both types of deadlifts test leg, hip, and back muscles, sumo deadlifters seem to get more advantage from wearing a deadlift suit than do conventional lifters. A powerlifter in an online discussion thread wrote, “I know a few sumo pullers who get 85-115 lbs. from their suit!”²⁵

Those with little exposure to powerlifting may well wonder why competitors would put themselves through all this for 90 seconds of competition in an admittedly minor sport. There is, in fact, a good deal of pain involved with wearing tight-fitting PEG. Wraps leave bruises circling the knees, and most lifters sport bruises and abrasions on their thighs from the squat suit’s tight legs. Bruises, open sores, and blood blisters also commonly result from bench shirts.²⁶ Those inside the sport can better understand why some lifters choose this path. Lifting bigger weights, imagining yourself as stronger than you have ever been before, is seductive even though the “bigger weights” are not the result of increased strength of muscle. This is the great appeal of gear. It is a form of performance enhancement that not only works but allows us to re-imagine our personal limits. Powerlifting gear is, in essence, an exoskeleton that the lifter encases himself within, and it allows the lifter to believe that he is stronger than he would have been without it, even though he is not. Standing on a box to harvest an out-of-reach apple does not make you taller.

The Early History

As is true for many sporting activities, there is neither a single place we can cite as the “birthplace” of powerlifting, nor a single date. In the United States, in the first four decades of the twentieth century, the only sanctioned form of competitive lifting was weightlifting and even in training sessions it was rare to see someone working hard at deadlifts, squats, or the forerunner of the bench press, the “press on floor.” In 1939, however, the Amateur Athletic Union sanctioned the first Mr. America physique contest and inadvertently created a new training goal for many weight trainers.²⁷ As bodybuilding grew in popularity in the 1940s, the bench press, squat, curl, and deadlift appeared far more frequently in gyms.



One of the USAPL’s best lifters is 2015 men’s open champion Ian Bell, who holds three American equipped records in the 93 kilo (205 pound) class. Ian, son of former world and American champion Gene Bell, squatted 375 kilos (826.75 pounds) and deadlifted 377.5 kilos (832.25 pounds) at the 2015 USAPL Nationals and also set a new total record of 967.5 kilos (2133 pounds). Although the gear he uses is all one-ply, Ian still needs help to get his PEG properly secured before he heads to the platform.



On 24 June 1949 *Iron Man* publisher Peary Rader, the tallest man on the left in this photo, and California gym owner Walt Marcyan (second on the left, seated) held a meeting to discuss the formation of a new professional association that would be known as the International Strongman Association (ISA). ISA promoted some of the earliest odd lift contests in America and helped the sport of powerlifting get its start. Following their organizational meeting, the group adjourned for dinner where this photo was taken. Seated on the left side of the table are: Peggy Redpath, Don De Marce, Walt Marcyan, Tony Terlazzo, Mrs. Terlazzo, and Mabel Rader. Standing on the left are: George Redpath, Peary Rader, unidentified man and Kerris Kerns. Standing at the end of the table and continuing to the right are: John Davis, Leo Stern, Vince Gironda, unidentified man, Willis Reed, unidentified man, Les Stockton, George Eiferman and another unidentified man. Seated on the right are David Willoughby, Gene Jantzen, Alyce Yarick, and Peggy Gironda.

And not surprisingly, some men found these simpler movements — generally referred to as “the odd lifts” — more appealing than the complexities of the clean and jerk.²⁸ Following Bob People’s historic deadlift of 725.5 pounds at a bodyweight of 181 pounds in March of 1949 — a record described by Al Thomas in *Iron Game History* in November 1992, as “the lift heard round the world” — odd lifting gained considerably in popularity. This coincided with a growing feeling of frustration among some of the most famous names in the strength world over the fact that the AAU considered them professionals and excluded them from sanctioned weightlifting and bodybuilding meets. If you owned a gym, published a magazine, coached for money, gave weightlifting exhibitions, or had in any way earned money because of your physical skills, you were ineligible according to the AAU. According to *Iron Man* magazine publisher Peary Rader, attempts to find some way to get around this rule led nowhere in the late 1940s and so Rader and California gym owner Walt Marcyan decided to take the lead in forming a new organization for men

and women like themselves who made money from lifting.

Their first step was to make plans to hold the “First Professional Strongman Championships,” and “Mr. 1949” physique contest in Los Angeles, on 25 and 26 June 1949. On 24 June, Rader held a meeting for those interested in joining forces to create a new professional association called the International Strongman Association (ISA). Attending that organizational meeting was a veritable “Who’s Who” of post-war strength aficionados that included Bert Goodrich, Walt Baptiste, Gene Jantzen, Peggy Redpath, George Redpath, George Eiferman, David Willoughby, Pudgy Stockton, Leo Stern, Karris Kern, Frank Thompson, Don DeMarce, Willis Reed, Tony Terlazzo, and Mabel Rader. By the end of the day, Peary Rader was president, Bert Goodrich was vice president, Don DeMarce was secretary-treasurer, and David Willoughby had been named record keeper and asked to draft bylaws for the group.²⁹ Rader and Marcyan hoped that in addition to sponsoring contests ISA would also serve as a true professional

association — like the National Strength and Conditioning Coaches now does, or the American College of Sports Medicine. As Rader explained their goals in *Iron Man* magazine in 1949, he and Marcyan believed, “that the Body Culture profession had advanced to the point where it needed organization for its own protection from other healing arts, as well as to give members protection within the profession.”³⁰ While ISA made little headway on the professionalization of the “Body Culture” industry, the association did play a role in the evolution of powerlifting and successfully sponsored several early meets. However, there was no uniformity of lifts. At a 1955 meet in Oakland, California, the contested lifts were the Olympic press, the upright row, the bench press, the squat, and the deadlift. According to Rader, “At this contest the highest bench press was 360 and the highest deadlift was 625 — done by a heavyweight by the name of Tiny Walsh from Ed Yarick’s gym, who weighed 263 pounds. There were also ten women contestants in this contest, a fact that suggests women were not as late to the sport as many have thought.”³¹

In January 1956, a meet held at the Boston YMCA used the Olympic press, the squat, and the deadlift as its events. That same year, the YMCA in St. Paul, Minnesota held a competition in which competitors performed the bench press, squat, and deadlift. This contest may be the first in history to include only the three modern powerlifts.³²

As interest continued to grow in non-weightlifting competitions, Rader and his ISA group began reaching out to amateurs as well as pros. According to Rader, this move stimulated the AAU to begin sponsoring its own odd-lift meets, often as an afterthought at weightlifting contests. By 1964, the AAU had begun formalizing plans for powerlifting to become an official part of AAU weightlifting’s governance structure. At an AAU meeting in June that year officials voted to remove the curl from the approved lifts from and to add a super-heavyweight class, which did not exist in weightlifting in this era. They also solidified plans for an unofficial national championships to be held in September 1964 called “The Powerlifting Tournament of America.”³³ The following year the first official AAU Senior National Powerlifting Championships was held in September at York, Pennsylvania.³⁴ The sport of powerlifting had finally arrived.

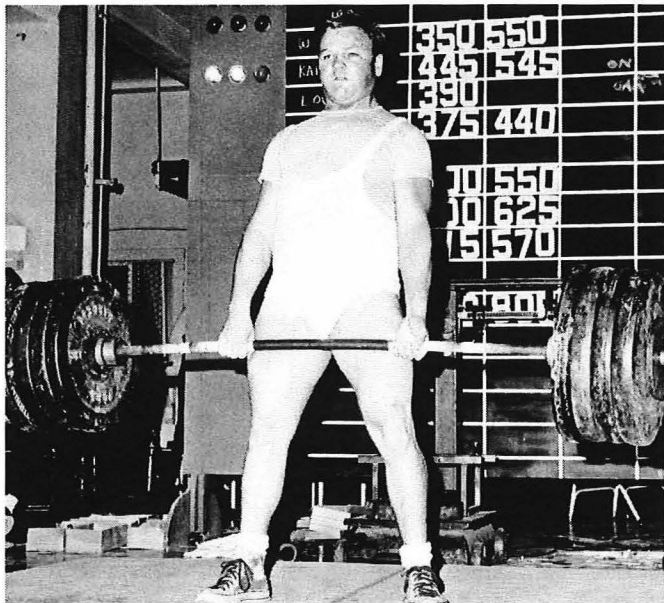
In the 1960s when the sport began and there were almost no providers of lifting equipment, the cos-

tumes of powerlifters widely varied. Although some lifters wore lightweight, stretchy wrestling and weightlifting singlets, other men competed in shorts and t-shirts rather than a one-piece suit. Shoes also ran the gamut from high-top basketball shoes to work boots, to wrestling and boxing shoes, and even to “dress shoes” that had not been manufactured with sport in mind. National champion Ronnie Ray, for example, wore leather loafers when he squatted.

An examination of the photographs accompanying Ralph Countryman’s article on the 1965 Senior National Championships in *Iron Man Lifting News* provides a good idea of the primitive state of competition clothing in this era. There are 43 photographs included with his report, and in 20 of the images the lifter is wearing only a singlet — or a singlet with a simple t-shirt — underneath it. In 23 photos, shorts and T-shirts can be seen, and not a lifting suit. In 28 photographs the men are wearing belts, all of which are narrow in front like the belts used in Olympic weightlifting. Only six men are wearing any kind of knee wraps, but the material appears to be similar to what we would now call an “Ace bandage” — the thin, elastic bandages used to wrap sprained ankles and other kinds of sport injuries.³⁵

Three short years later, at the 1968 Senior National Championships in Los Angeles, lifters had begun pushing the boundaries of supportive equipment. According to powerlifting author Ken Leistner, a number of methods for increasing lifts began emerging by that time. Leistner suggests, for example, that national champion Jerry Jones cut tennis balls in half, placed them behind his knees during the squat, and secured them in place with Ace bandages. Other lifters, he suggested, sewed two Ace bandages together to make longer wraps, as the rules permitted only one bandage per leg and did not set a length limit.³⁶

The most egregious offender at the 1968 meet was Californian Tom Overholzer who, in an attempt to increase his squat, reportedly wrapped his torso with bedsheets, covered the sheets with a layer of Ace bandages, and then put on his singlet.³⁷ As is often the case when a record is at stake, the quest to be first in his weight class to make some sort of “barrier weight,” such as a six-hundred-pound squat, is apparently what led Overholtzer to push the limits of gear so extravagantly. According to Leistner, “The judges moaned about the bedsheets but there was no official rule that prohibited any of this.”³⁸



Although he doesn't appear to be wearing any supportive gear in this deadlift shot, Tom Overholtzer was known for his use of Performance Enhancing Gear. He wrapped his torso in bedsheets and Ace bandages that he then covered with his singlet when he squatted 655 pounds in the 181-pound class at the 1968 Senior National Powerlifting Championships. Overholtzer's use of gear confounded the judges at the Seniors as the rules did not specifically state that such wraps were illegal.

Iron Game historian Herb Glossbrenner basically corroborates Leistner's account, as does *Powerlifting USA* editor Mike Lambert, who was critical of the excessive wrapping. "Despite the illegal wraps, a tremendous psyche, and probably steroids along with an upper or two; the minute the guy got the bar out of the rack he looked like he was going to die ... you know ... he's shaking... the bars shaking ... the plates are rattling ... the guy's face is purple ... he's surrounded by half a dozen nervous spotters," Lambert wrote.³⁹ Nevertheless, "with [Overholtzer's] lifting attire on you couldn't see any tell-tale seams from the wraps underneath," Lambert admitted.⁴⁰ However, according to Glossbrenner, because Overholtzer's hips and torso were wrapped so tightly, he was unable to walk. This meant that his handlers – one under each arm – had to carry him from the backstage warm-up area and out to the lifting platform and place him directly under the bar. At that point all he had to do was lift the bar up off the squat stands, wait while his helpers removed the squat stands, make his attempt, wait while the racks were replaced, and then have his spotters once again carry him offstage.⁴¹

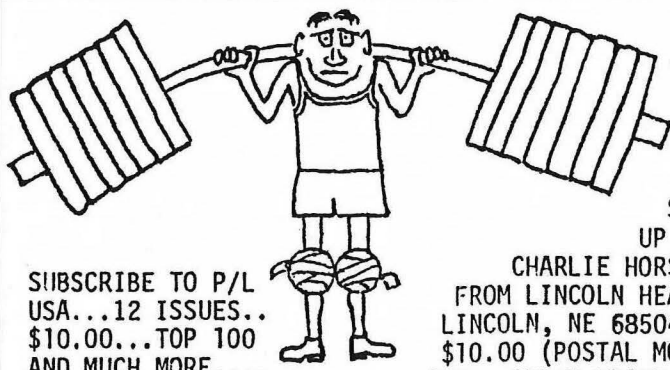
Overholtzer was not the only man attempting to get an edge from gear at the 1968 meet. Leistner reports

that in the bench press he saw "t shirts that went below the elbow, obscuring Ace bandages wrapped around the upper arms and/or chest area." Other men, he explained, wore blue jean shorts to aid their squat. Wrote Leistner, "it was the 'fashion' [among California lifters] to take a pair of very tight jeans . . . and cut them very short so they could be worn under a lifting singlet. Some guys wore two or more pair of these, one a size larger than the one beneath it."⁴²

Overholtzer's pushing of the limits sparked a debate that led to profound changes in the sport. In December, Peary Rader wrote an editorial in *Iron Man Lifting News*, titled "Power Lifting Dilemma," that decried the excessive use of supportive garments and wraps. "Although there were many exciting moments in the powerlifting championships," he wrote, "one of the most discouraging ... is the attempts of many lifters to cheat, in their lifts."⁴³ By "cheating," Rader referred specifically to the wrapping of bed sheets, as well as lifters wearing multiple pairs of cut-off jean shorts and using extra-wide, tight wraps around the knees and elbows. "We, as officials, found it necessary to go back and have them remove these pants and wraps so that they could conform more nearly to the rules," Rader explained. "However, it was a hopeless task, since as soon as we left the dressing room ... they would replace the wraps and come back in their original condition upon the platform to lift, and they were heard to brag in the back room about how they were fooling the officials ... Everyone we have talked to or who has talked to us regarding the power lift championships has been equally disappointed and disillusioned."⁴⁴ Rader did acknowledge, however, that most lifters did not go to such lengths, and commended those who had "the courage to come out and lift by the strength of their muscles alone without resorting to artificial aids."⁴⁵

Author Ralph Countryman, an attorney, writing in the 1969 issue of *Iron Man Lifting News*, agreed. Wrote Countryman,

The saddest news coming from this Seniors was the utter disregard for the rules or the spirit of the rules by a few lifters. The use of bandages, torso wraps, and braces, unauthorized lifting apparel to disguise this situation too, is a perversion of the rules that denies the lifter himself, as well as other lifters, the



KNEE WRAPS

WHAT'S A MATTER, BUNKY? DID YOUR ACE BANDAGE RIP IN HALF AFTER YOUR FIRST SET OF WARMUPS? MOVE UP TO THE VERY BEST.....

CHARLIE HORSE WRAPS ARE AVAILABLE FROM LINCOLN HEALTH CLUB, 838 N. 48th, LINCOLN, NE 68504, 1 PR.-\$5.50, 2 PR.-\$10.00 (POSTAL MONEY ORDERS ONLY).....

AND...SUPER WRAPS ARE BACK...ORDER FROM GEORGE ZANGAS, 6010 N. 74th ST., LOS ANGELES, CA 90045, 1 PR.-\$5.50, 2 PR.-\$10.00, 5 DOZ. OR MORE-\$4.00 A PR. (PERSONAL CHECKS OKAY).

SUBSCRIBE TO P/L USA...12 ISSUES.. \$10.00...TOP 100 AND MUCH MORE.... BOX 467, CAMARILLO, CA 93010....IT'S THE NATIONAL P/L MAGAZINE

lifting.⁴⁷

The images accompanying Countryman's 1968 meet report differ in significant ways from the pictures at the 1965 Senior Nationals. There are 50 photos in *Iron Man Lifting News* and in 22 of them the athletes are shown wearing knee wraps that appear to be more substantial and thicker than in the earlier set of images. Some men are also wearing what is now called a "knee sleeve," that appears to be made of a dark, shiny material

resembling rubber. Knees were not the only joint wrapped, however. Nine individuals have their wrists wrapped, and two lifters have their elbows wrapped during bench press attempts. Thirty-five belts appear in the images and, like the wraps, some of the belts appear wider and thicker than the ones used in 1965. Although these may seem like relatively minor differences, they suggest that the quest to find supportive equipment to enhance performance in powerlifting dates to the very early years of the sport.⁴⁸

George Zangas' first ad for powerlifting gear appeared in June of 1977 in *Powerlifting USA* magazine. The hand-drawn artwork and simple message are in stark contrast to today's colorful, professionally designed advertisements featuring star athletes and hyperbolic text.

*pleasure of an honest victory in a legitimate test of strength. Some of these medals belong almost as much to Johnson & Johnson [Ed note: makers of Ace bandages] as they do to the lifter who accepted them (names are withheld to protect the guilty) ... The problem is really one of establishing clear-cut rules and giving them equal enforcement throughout the country. The lifters can't be blamed for going to the extent of the rules, although there will always be some who will stretch and press for additional advantage.*⁴⁶

In November 1972, at the AAU National Convention in Kansas City, Missouri, a unanimous vote of the National Weightlifting Committee banned all wraps and supportive devices in powerlifting. As reported by Clay Patterson in the December 1972 *Powerlifting News*, the new rule stated, "There will be no wraps, bandages, or supportive devices of any description except the standard lifting belt. This is a standard 3/8" thick belt, four inches wide worn around the waist."⁴⁹ Additionally, the committee passed a rule that stated, "Any lifter completing a lift for a record will be immediately stripped backstage by the referees and checked for wrapping."⁵⁰ They also voted at that meeting to participate in the newly formed International Powerlifting Federation (IPF) and to send a team to its first World Championships, scheduled for 1973.⁵¹

As might be expected, many lifters strongly opposed the ban on wraps. Dan DeWelt, publisher of the small journal, *Powerlifting News*, launched in March of 1972, featured the news on the cover of his December issue with a headline proclaiming, "'NO WRAPS' Rule

As might be expected, many lifters strongly opposed the ban on wraps. Dan DeWelt, publisher of the small journal, *Powerlifting News*, launched in March of 1972, featured the news on the cover of his December issue with a headline proclaiming, "'NO WRAPS' Rule

As might be expected, many lifters strongly opposed the ban on wraps. Dan DeWelt, publisher of the small journal, *Powerlifting News*, launched in March of 1972, featured the news on the cover of his December issue with a headline proclaiming, "'NO WRAPS' Rule



This photo of lifters in the 123 and 132 pound classes from the mid-1960s is a good example of the variety of clothing lifters wore on the platform in the early days of sport. Tanktops, t-shirts, narrow weightlifting belts, tight and loose shorts, singlets, work boots, and even loafers were all *de riguer* before the AAU established uniform rules.

Passed — 220 lb. Class Ok'ed.” Over the next several months, *Powerlifting News* readers like James Douglas Edward voiced their strong opposition to the loss of gear. “It actually took my breath to read that ‘wraps’ are no more,” he wrote. “It’s really very simple minded when you stop and think about it. Then I had to laugh as I read of our British lifters using 18 feet of wraps. Our 72” [of wraps] should be made mandatory rather than omitting them. Who the hell is responsible for making such a mistake? I bet this rule was made by people who are non-lifters.”⁵² In the same issue, columnist Hollie Evett argued that wraps added to the safety of lifters, writing, “In many sports the first thing to go is the joints. Doesn’t it make sense to add a little protection to them?” Evett went on, “The fallacy that injured athletes shouldn’t compete is also very sad. Hugh Cassidy won the Senior Nationals and World Championships with a knee that needed surgery. He felt the rubber knee bands had been a blessing. ... Even if the wraps do increase performance, whether it’s psychological or by increasing strength, who should care if one is allowed to use equal protection.”⁵³ Other lifters expressed similar sentiments in the following months. In the March-April 1973 issue of *Powerlifting News*, Dave Krieg stated, “When I start-

ed powerlifting many years ago I sustained very serious injuries in both knees while performing limit squats without wraps. It was almost two years before I could squat again. When I resumed my squat routine I always used wraps, and the only time I have experienced knee pains is when I failed to use the wraps in the warm-up sets.” Krieg believed that if he had used wraps initially, he would not have had an injury. His support for wraps was not unconditional, however, as he wrote, “The only beef I can see against wraps is the excessive length used by some lifters.”⁵⁴

The moratorium on the use of gear proved to be short-lived. One year later, at the first IPF World Championships in York, Pennsylvania, the new federation adopted rules for appropriate costumes which then had to be followed by all member federations, including the AAU. *Muscular Develop-*

ment, Bob Hoffman’s bodybuilding and powerlifting magazine, covered the first World Championships and printed the new rules adopted at the Congress. On the matter of uniforms, the IPF adopted the following rules pertinent to our discussion.

4. Lifters must appear in correct and tidy dress which must consist of a vest with short sleeves, trunks of a form fitting stretch material and athletic supporter; or alternatively of a full length costume with athletic supporter.
5. Proper lifting costume shall include shoes.
6. If a competitor wears a belt, its width must not exceed ten centimeters. (3 9/10 inches.) It is forbidden to wear more than one belt.
7. **Bandages**
 - (a) Rubber – Bandages or supports of rubber or rubber substitute are forbidden.
 - (b) Wrists – Bandages of gauze or medical crepe may be worn

with a maximum width of 8 cm. (3 1/8th inches) and a maximum length of one meter may be worn.

(c) Knees – Bandages of gauze or medical crepe may be worn with a maximum width of 8 cm. and a maximum length of two meters. (6 feet, 6 inches) Alternatively, an elastic knee-cap may be worn with a maximum length of 20 cm. (7.87 inches). A combination of the two is forbidden.

(d) Body – Bandages around the torso are forbidden. Spot plasters to muscle injuries may be applied by the official IPF doctor on duty.

...

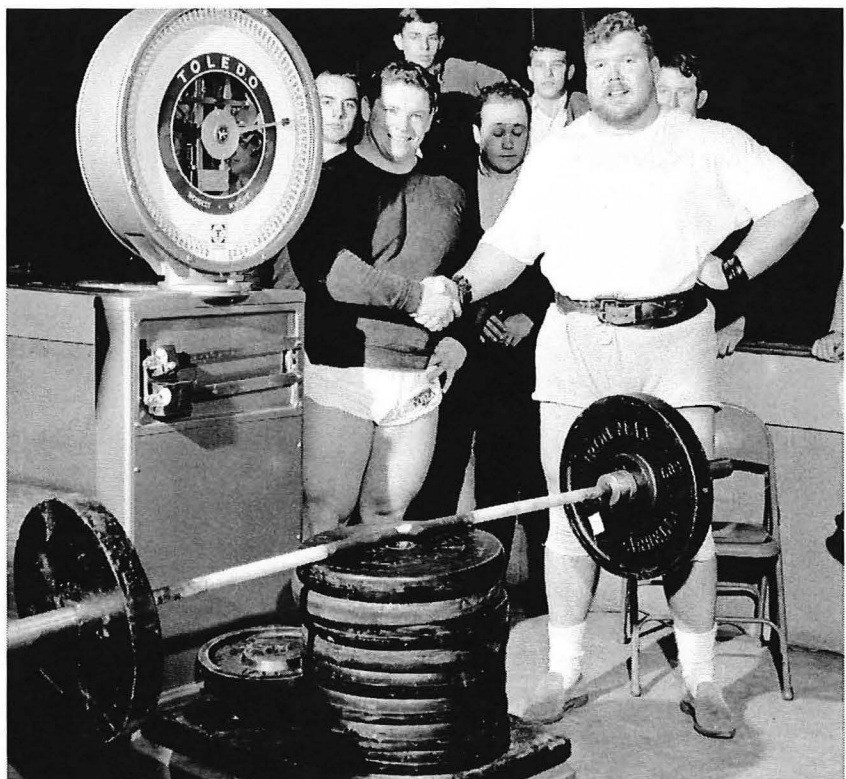
(g) Bandages of any form on elbows are prohibited.⁵⁵

No doubt these early officials had hopes that the new uniform rules would level the playing field for all competitors. However, the establishment of an official IPF world record list proved a powerful incentive for lifters to once again look for that additional edge. And so, almost immediately, lifters began searching for materials to provide themselves with the greatest support possible within the letter of the new rules.

While Dan DeWalt's magazine carried virtually no advertising, during its first year of publication, in 1972, he gave a plug to the Sta-Slim company sellers of neoprene knee and elbow sleeves which he described as "useful items most called for by powerlifters."⁵⁶ De Welt ceased publication of his journal in late 1973 and for the next several years there was no specialized magazine covering powerlifting in the United States. The founding of *Powerlifting USA (PLUSA)* magazine by Mike Lambert in June 1977, however, changed things dramatically. *PLUSA* not only kept lifters up to date on meet news and records, it also provided a reliable advertising venue that over the years worked

sympiotically with the early gear entrepreneurs. Lambert's first issue carried only one ad for gear — an ad for knee wraps from powerlifter George Zangas of San Pedro, California. (Zangas' wraps were significantly stronger than the Ace bandages of earlier years.) Made of a heavy, highly elastic material that Zangas found through a medical supply company, they gave much more support to squatters and within a year, Ace bandages virtually disappeared from the sport.⁵⁷

Powerlifting legend Larry Pacifico, who began lifting in 1965 and eventually won nine IPF world titles, claimed in an interview with the authors to have created the first supportive powerlifting suit in either 1973 or 1974.⁵⁸ According to Pacifico, although the bed sheet episode was not something he wanted to replicate, he realized that the extra layers of fabric surrounding Overholtzer's body provided support to help him lift more weight and the incident gave Pacifico the idea of making a suit with thick fabric that would work similarly. As he tells the tale, he called Spanjian Sportswear, a company



In 1965, Terry Todd set a total record in the superheavyweight class at a meet in Tennessee, while wearing cut off sweat pants, a narrow lifting belt, and knee sleeves that he left on throughout the entire contest. On his feet, he wore Polish weightlifting shoes in the squat, deadlifted in his socks, and benched in his Hush Puppies loafers. Gene Roberson, who took second to Todd, competed in the long-sleeved sweat shirt and white gym shorts shown in this photo, taken at the weighing of the weights following Todd's record deadlift of 730 pounds.

that made wrestling singlets, and asked for their assistance in finding a fabric of heavier weight. Pacifico also wanted his new suits to have a longer leg, as most wrestling singlets were cut very high on the leg, close to the gluteus muscles. So Pacifico and Spanjian reached an agreement, and they sent Pacifico a few samples.⁵⁹ [Editor's Note: Pacifico gave one of these early prototype suits from Spanjian to author Jan Todd during her powerlifting career in the late 1970s. The straps were the same width as a narrow wrestling suit and the fabric was so stretchy that Todd used it as her "singlet" for bench and deadlift as well as squatting in the beginning of her career.]

Although the first fabrics were still fairly elastic, the company eventually found a stiffer canvas-type fabric that allowed lifters to improve their squats. Wearing one of the early suits, Pacifico stated, provided about 30 to 40 pounds of support at the bottom of a squat, a significant increase in performance. Pacifico recalled that he then began buying ten suits at a time from Spanjian in order to resell them to other lifters at the powerlifting meets he attended. Word of what he first called the Super Suit soon spread, and the potential of lifting heavier weights along with buying from a world champion led to big business for him. He began ordering 50 suits at a time, then 60, and soon he was purchasing one hundred suits at a time. Eventually, said Pacifico, "if I would attend the world championships abroad, I would take 500 suits with me, and they would be sold out within the first day."⁶⁰

With so much success, however, Pacifico's market soon became contested territory. In 1976, George Zangas outsmarted the champion by calling Spanjian and negotiating a deal that granted him exclusive rights to the suits that Pacifico had essentially designed. Spanjian agreed because Zangas offered to buy in bulk on a regular basis. Pacifico recalled, "He was smarter than I was. He got in and got a corner on the market."⁶¹

Pacifico, however, was also clever about business. He soon made a deal with Zangas to buy suits at the wholesale price, and in return, he allowed Zangas to use the name "Super Suit," which Pacifico had coined for the squat suit. According to Pacifico, the two men, who remained good friends, "pretty much became partners in the Super Suit business."⁶² Zangas sold suits under his Marathon company name, and Pacifico used his own name.⁶³ Pacifico estimated that together, he and Zangas sold between three thousand and four thousand suits per

year in the late 1970s and early 1980s.⁶⁴

Zangas, who ran a health food store in San Pedro, California, and passed away in October 2011, was the first to advertise "Super Suits" in *Powerlifting USA* magazine.⁶⁵ Unlike Pacifico, who sold the suits mostly at meets, Zangas used *Powerlifting USA* to create a mail-order business based on his ability to ship suits out on demand. His first ad in the February 1978 issue not only noted that the suits were "Worn by the top champions!!!" but that they were also, "Now available from the manufacturer on a regular basis!" They sold for \$40.00 each.⁶⁶ Zangas' first generation of Super Suits were made of a heavy beige canvas-type material that had very little stretch to it. The beige suits were, frankly, unattractive, and so Zangas began dyeing the suits red, blue, and black, and found his sales grew exponentially. So did competition in this era, as several "cottage industries" emerged to feed the market for new forms of powerlifting gear. By the February 1980 issue of *Powerlifting USA*, ads for Weight Lifter's Warehouse, Lincoln Health Club, Pat's Power Products, and Strength Systems, all included squat suits and/or wraps for sale that were similar to those Zangas and Pacifico sold.

Titan Support Systems

One of these early "cottage" industries, Titan



Canadian powerlifter Peter Perry, wearing one of Larry Pacifico's early suits, suffered a "blow-out" in the squat at the 1979 World Powerlifting Championships in Dayton, Ohio. Blow-outs were very common in the early days of gear and inspired Pete Alaniz and his mother, Irma, to begin manufacturing Titan suits.

Support Systems, is now among the largest powerlifting equipment companies in the world. Pete Alaniz Jr., a co-founder of the company, had his first exposure to PEG at the 1978 Texas Novice State Championships at Houston Baptist University in Houston, Texas. He had been training for approximately three years by that time, but had not heard of gear.⁶⁷

While Alaniz and his training partners were warming up in their standard attire – a singlet, some Ace bandages for knee wraps, and a lifting belt – they spotted a few lifters with different apparel. Several of the men had acquired first-generation Super Suits. As the lifters worked their way into their gear, a curious crowd gathered around them. What began as a warm-up quickly turned into a question and answer session as the geared lifters fielded queries about their cutting-edge equipment. Alaniz remembers clearly the impact of seeing these suits for the first time. “Once the squats started, a whole new era began for us,” he explained. “Most lifters had a pretty good idea of where they stood in the rankings and were also pretty familiar with their competition ... Now all of a sudden peers or those who we thought of as peers pulled ahead ... way ahead,” explained Alaniz. “The conclusion of our crew was that we had to modernize and level the playing field.”⁶⁸

As Alaniz tells it, he and his training partners bought suits of their own and after using them for a few months, he had a conversation with his mother that changed the course of his life. Alaniz’s mother, Irma, who understood sewing and was also very smart, pointed out some of the manufacturing flaws she saw in the suits. She believed, for example, that the straight stitching used by Spanjian was not optimal. She believed that the best stitch would be more like a zig-zag stitch that would move “in conjunction with the stretch of the fabric and body contours,” and would also “absorb, not fight stress” created while lifting. Additionally, she identified the weakness of the diamond-shaped piece of fabric, held in place by four seams, used in the construction of the crotch on Super Suits. Super Suits were famous for their often-embarrassing “blow-outs” in the bottom of the squat, and Irma also thought she knew how to fix that problem.⁶⁹

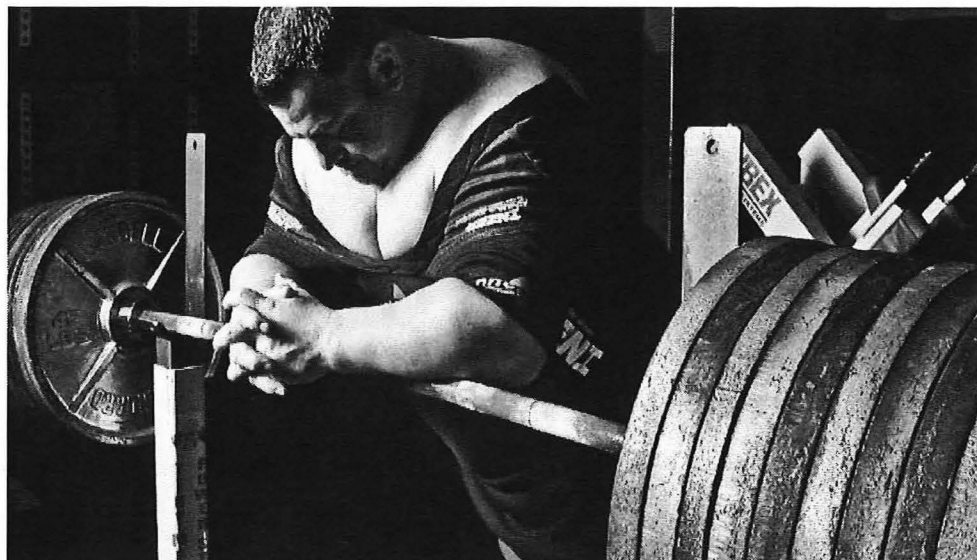
After talking about this within the Alaniz family for some time, the entire family decided to go into the Super Suit business in 1981. They set up shop in their garage in Corpus Christi, Texas. Pete’s grandmother bought and donated a \$200 sewing machine from Sears

to the company, and his uncle, a CPA, provided accounting advice.⁷⁰ Launching a new business, even a cottage industry run with family members, was a big challenge. The family initially financed the company by maxing out their credit cards. Later, when banks agreed to provide loans, they “had to pledge [their] autos, homes and bank accounts as collateral.” Despite these hardships, claimed Alaniz, “Our very first classified ad produced about \$3,000 in sales in the first month.” The company has grown steadily ever since.⁷¹

Inzer and the Bench Shirt Wars

Innovation in powerlifting gear was not limited to the squat suit, of course. The February 1980 issue of *Powerlifting USA* featured the first advertisement for a bench press shirt. Sold by J’s Gym in Statesboro, Georgia, the ad boasted that the shirt was “Worn at World Championships,” and “Makes for Increased Bench.”⁷² Made essentially like a T-shirt, but out of heavier fabric, the ad also told those responding to, “Please State your Weight for a Firm, Tight Fit.”⁷³

Other early entrepreneurs also began thinking about bench shirts and what they could mean for more gear sales, but it was powerlifter John Inzer who revolutionized bench pressing with an innovative shirt design he began marketing in 1973. Inzer’s early shirts were made of a heavy fabric that barely stretched at all and had the sleeves set in a more forward position to maximize the rebounding effect of the fabric in the bottom of the lift.⁷⁴ It appears that when Inzer went to patent his design he learned that New York fashion designer Gabriele Knecht already had a patent for clothing with armholes placed slightly forward of the midline of the body.⁷⁵ Knecht, who has no known connections to powerlifting, was not trying to invent a bench press shirt when she registered her design. However, by purchasing all her rights to that patent, Inzer was able to prevent any other company from creating bench shirts with a “forward sleeve” design.⁷⁶ Until 2002, when his patent expired, Inzer fiercely protected his rights to the Knecht design in court, making it essentially impossible for others to enter the bench shirt market.⁷⁷ Titan owner Pete Alaniz claimed, “Inzer definitely beat everyone to the punch by getting exclusive license. By the time our patent and trademark lawyer reached [Knecht] it was too late. We had been producing shirts a short time and were confident we had a superior design, but there was no way around the patent or the licensing agreement.” Given



The heaviest bench press on record — 1102 pounds — was made by Texan Paul “Tiny” Meeker in 2013. As can be seen, the “Inzer Phenom” bench shirt Meeker wore that day has an open back, and is cut low in the front so that the tightness of the fabric is concentrated across the center of the chest and shoulders where the shirt functions like a stretched slingshot.

their sales and the growth at the time, Alaniz said that the company “was on track to make its first big move in the late 80s.” However, rather than face lawsuits from Inzer, “the family voted to wait for the patent to expire and move into the public domain. We knew it would be a long wait and that we would be in a disadvantaged position, but we decided to wait it out and adapt meanwhile.”⁷⁸

According to Larry Pacifico, Inzer was also smart about attending powerlifting organizational meetings, getting to know the rule makers, and thereby helping to pave the way for the acceptance of his suits and shirts which have required numerous rule changes to be considered legal in the various federations. He also traveled to many of the countries where powerlifting was most popular to convince IPF decision makers to allow his various versions of the bench press shirt into competition. While a few bench shirts continued to be marketed that lacked the sleeve placement of Inzer’s shirts, those products faded in the face of the superiority of Inzer’s design.⁷⁹ Said Pacifico, “John was a very smart guy... once [he] got into the business, it put pretty much everybody out of business.”⁸⁰

Concluding Thoughts on PEG

These days the amount of assistance bench shirts provide depends on far more than just forward sleeve placement. Bench press great Ted Arcidi wore one of the

first models of the bench press shirt when he broke the 700-pound barrier in the bench press on 3 March 1985 in Honolulu, Hawaii.⁸¹ However, like many early lifters Arcidi still feels the need to qualify his lift based on the modern records made with stronger gear: “Back in the mid-1980s the original prototype supportive bench press shirt was 50% polyester and 50% cotton and only one layer thick. It was more like a sweater and not at all like the laminated four or five layers thick armor suit that many powerlifters use today.”⁸²

Arcidi is correct. In the twenty-first century the heaviest bench presses are made with heavily constructed shirts like Inzer’s new “SDP Phenom.” The Phenom has an open back that allows for a much better range of motion than the old shirts that had full backs as well as full fronts. In the Phenom and the Jack Shirt — made by the gear company Metal, and other shirts like it — the shirt is not truly worn, it is merely fitted across the front of the torso so that it functions like a slingshot rather than a piece of clothing. The heaviest bench on record, made in a Phenom, now stands at 1102 pounds. Paul “Tiny” Meeker, of Texas, set the new standard in 2013.⁸³

In the late 1990s an anti-gear movement began to gather force within powerlifting and a Raw National Championships, sanctioned by the AAU, was held for the first time in August 1996. Although only 40 lifters competed in this first contest, powerlifting official Joe Pyra believed that “It opened the way for more RAW meets in the future by showing the lifters what is doable and that fair/good RAW competition is available.”⁸⁴ Pyra proved prescient. Raw lifting is by far the fastest growing form of the sport of powerlifting. The USAPL sanctioned its own Raw Nationals in 2008; 12 women and 77 men competed in that contest.⁸⁵ Six years later, 1,147 competitors turned up at the 2015 Raw Nationals in Scranton, Pennsylvania, which offered men’s, women’s, teenage, and masters divisions.⁸⁶ Further evidence of the growing popularity of raw lifting emerged at the 2015

Longhorn Open Powerlifting Championships in Austin, Texas, where, according to meet director Kim Beckwith, 100 out of the 118 lifters in that meet chose to compete raw.⁸⁷

These differing approaches to powerlifting – geared versus raw – demonstrate two radically different philosophies utilized in the sport. At the USPF Women’s Nationals Powerlifting Competition in 1982, Brother Bennett, founder of the American Drug Free Powerlifting Association, stated, “sports [serve] the purpose of developing and training the body to maintain and make effective use of our physical abilities ... improvement and success in sports can be a gratifying experience.”⁸⁸ Conversely, Louie Simmons, a staunch opponent of drug testing and an outspoken advocate for supportive equipment, asserted, “until the end of time people will seek out a way to win. That’s human nature. Most use computers today, not an ink quill.”⁸⁹

Although contests such as the 2015 Longhorn Open suggest that Simmons’s comment about human nature is far too dogmatic, those who subscribe to his “anything goes” view are reluctant to accept limits on an athlete’s performance.⁹⁰ From their perspective, sport’s goal is to transcend limits by any means necessary.⁹¹ Gear advocates hold that athletic competitions are like scientific experiments — controlled environments for manipulating test subjects and discovering new phenomena.⁹²

However, what we would call the traditional or purist view seems to be gaining ground. This view, first espoused by Peary Rader in 1968, argued for powerlifting to be a sport in which lifters had, “the

Table 2. Average Lifts as % of 1960s Lifts for Top 10 Male U.S. Lifters

Squat				
Weight Class	1960s	1970s	1980s	1990s
123	100%	122%	135%	130%
132	100%	112%	130%	121%
165	100%	128%	144%	143%
181	100%	123%	141%	134%
198	100%	118%	128%	131%
242	100%	114%	127%	136%
SHW	100%	123%	131%	130%
Avg. All Classes	100%	120%	136%	136%
Bench Press				
123	100%	112%	112%	110%
132	100%	109%	114%	111%
165	100%	115%	122%	118%
181	100%	109%	130%	120%
198	100%	103%	124%	98%
242	100%	111%	104%	126%
SHW	100%	114%	111%	121%
Avg. All Classes	100%	110%	118%	118%
Deadlift				
123	100%	119%	107%	110%
132	100%	107%	115%	106%
165	100%	113%	120%	119%
181	100%	123%	131%	126%
198	100%	116%	120%	114%
242	100%	112%	119%	117%
SHW	100%	110%	114%	108%
Avg. All Classes	100%	114%	118%	115%
Total				
123	100%	118%	118%	117%
132	100%	109%	120%	112%
165	100%	118%	129%	127%
181	100%	119%	135%	128%
198	100%	113%	124%	116%
242	100%	113%	118%	126%
SHW	100%	116%	120%	119%
Avg. All Classes	100%	115%	125%	123%

courage to come out and lift by the strength of their muscles alone.” Lifters subscribing to the purist positions make an ethical choice to not use the most supportive forms of gear.⁹³ They believe that questions such as “Which suit was he wearing?” or “Which knee wraps did she use?” should not obscure one’s understanding of the reasons for any successful lift.

The assertion that gear undoubtedly increases the weights that individual athletes are capable of lifting is not debatable.⁹⁴ This became very clear in 2006, on the campus of the University of Massachusetts at Amherst, when the Atlantis Foundation and Brand 33 Sports put on the New England Record Breakers raw powerlifting meet to explore the gear question. As reported by Mike Lambert in the July 2006 issue of *Powerlifting USA*, “the question underlying this competition was ‘What can those big guys lift without the gear?’”⁹⁵ With Bill Kazmaier announcing, and former champions Ed Coan, Jan Todd, and Terry Todd as judges, Brian Siders placed first with a 2200-pound total at a bodyweight of 339 pounds. His lifts in the squat, bench, and deadlift were 785, 605, and 810, respectively. Donnie Thompson was not far behind with a 2170 total while weighing 374 pounds. His marks were 805, 565, and 800 pounds. Lambert wrote that the aforementioned question “was answered rather clearly in the case of Brian Siders, who just 2 weeks earlier had totaled 2577 at the Quest American Open, and Donnie Thompson showed a similar differential over his best in equipped circumstances.”⁹⁶ However, despite the

impressive strength Siders demonstrated, the almost four hundred pound discrepancy between Siders's raw numbers and his equipped numbers dramatically demonstrates the effects of supportive equipment.

Lambert also commented on the performance of Mike Wolfe, who bench pressed over 800 pounds in an equipped meet before the Record Breakers, yet made only 600 pounds in Springfield. This is not to say that the raw lifts of Wolfe, Siders and Thompson are not impressive; they are very impressive. However, the discrepancies between the amounts they lifted in gear and without do demonstrate the kinds of increases possible with supportive equipment.⁹⁷

A far more astonishing example of the role played by gear was provided by Mike Miller, a super-heavyweight whose lifetime best squat, done of course in a geared contest, was 1220 pounds. When the lifting began and Kazmaier announced that Mike Miller was going to take his first squat with 600 pounds, many in the auditorium were astonished. No one expected Miller to come anywhere close to a 1200-pound squat, but for him to take less than half of his official best squat seemed unbelievable to those who were there. In an interview before he agreed to join the writing team for this article, Terry Todd told Dominic Morais, "I watched him carefully to be sure he went low enough, but both Jan and I — sitting on opposite sides of the lifter — turned him down for not going down far enough. (Eddie Coan, the head judge, saw the lift as good, but the lift failed two to one.) At that point I wondered if he'd take the same weight again, which is normal if you miss your first attempt, and that's what he did. Once again we watched, and this time he got just a bit lower and the lift was passed, two to one. I was very surprised, however, to see that his 600 squat didn't look at all easy, and further surprised that he asked for 800 pounds for his final attempt. With 800 on the bar — over 400 pounds less than his geared best — Miller didn't even come close to completing the lift, even though his depth was even worse than his first attempt."

Using statistical data compiled by Herb Glossbrenner for *Powerlifting USA*, we examined performance data and averaged the weights lifted by the top ten U.S. male lifters in the 1960s, 1970s, 1980s, and 1990s to see the effect of increased gear use in the sport.⁹⁸ We are aware that this admittedly unscientific survey cannot account for: 1) the refinement of technique and training; 2) the use and non-use of anabolic-androgenic steroids;

3) the gradual easing of judging standards over the years; and 4) the occasional outlier or phenomenon of strength who appears and rewrites the records books. However, with these caveats in mind, Table 2 nonetheless bolsters the evidence that supportive gear clearly affects the amount of weight lifted in powerlifting. As shown, our examination of percentage changes from the 1960s, when the use of gear by lifters was limited and/or in its nascent stage, to the 1990s is staggering. First, the poundages in the squat increased by at least 30 percent in virtually every weight class, while the bench and deadlift experienced no more than a 15 percent increase. That the far greater performance increase occurred in the lift that utilizes the most gear is no coincidence. Second, comparing these increases in performance to increases in other sports is intriguing. For example, the decrease in time of Usain Bolt's 2008 world record 100-meter dash compared to Jarvis Frank's world record time 108 years earlier — in 1900 — is approximately 11 percent.⁹⁹ In a sport with limited performance-enhancing clothing or equipment, it can be assumed that these records demonstrate maximum human performance in the 100-meter dash at the time. Therefore, the extraordinary percentage increases experienced in powerlifting are almost certainly due to something other than just human capability. Although one might attribute this difference to the use of anabolic steroids, track and field is also a sport associated with performance enhancing drugs, and so to suggest that steroids alone are the cause of such widely varying increases is implausible.¹⁰⁰ *Our analysis demonstrates that PEG (performance enhancing gear) has played a far more significant role than PEDs (performance enhancing drugs) have played.*

These are not the only numbers that testify to the performance-enhancing characteristics of supportive gear and equipment. In comparing "male open raw records" to "male open equipped records" in the International Powerlifting Federation, which drug tests at all its competitions, the performance-enhancing effect of gear can also be seen (see Table 3). Although the possibility exists that better lifters may choose to lift with gear more often, the end result remains the same: the discrepancy between raw and equipped records is so marked that it demonstrates the performance-enhancing effect of gear.

As we suggested at the beginning of this essay, we are not attempting to solve the ethical questions related to the use of gear here. However, we cannot help wondering what the future of powerlifting will hold. Our

Table 3. IPF Raw & Equipped World Records by Lift

	Raw		Equipped		Difference	%
Weight Class	Lifter	Weight Lifted	Lifter	Weight Lifted		
SQUAT						
59kg	Fedosienko Sergey	498.2	Fedosienko Sergey	661.4	163.2	33%
66kg	Cascioli Stephen	530.2	Danilov Konstantin	718.7	188.5	36%
74kg	Hancott Josh	573.2	Olech Jaroslaw	810.2	237	41%
83kg	Gibbs Brett	628.3	World Standard	815.7	187.4	30%
93kg	Norton Layne	668	World Standard	870.8	202.8	30%
105kg	Raus Alex-Edward	727.5	Semenenko Dmytro	914.9	187.4	26%
120kg	Bouafia Mohamed	826.7	World Standard	948	121.3	15%
120+kg	Williams Ray	938.1	Christensen Carl Yngvar	1080.3	142.2	15%
BENCH PRESS						
59kg	Fedosienko Sergey	374.8	Fedosienko Sergey	443.1	68.3	18%
66kg	Berglund Eddie	402.3	World Standard	485	82.7	21%
74kg	Poinson Adrien	464.1	Poinson Adrien	540.1	76	16%
83kg	Gibbs Brett	453	Bakkelund Kjell Egil	575.4	122.4	27%
93kg	Cieri Dennis	512.6	Wegiera Jan	661.4	148.8	29%
105kg	Brown Leon	488.3	Dovganyuk Vadym	712.1	223.8	46%
120kg	Hokkanen Timo	518.1	Bilican Orhan	735.2	217.1	42%
120+kg	Boughalem Ilyes	596.3	Sandvik Kenneth	817.9	221.6	37%
DEADLIFT						
59kg	Fedosienko Sergey	596.3	World Standard	606.3	10	2%
66kg	Savolainen Antti	612.9	El Belghiti Hassan	690	77.1	13%
74kg	Meiyanto Doni	684.5	Gaishinetc Sergei	722	37.5	5%
83kg	Fazeli Amir	696.7	Martin Tomas	760.6	63.9	9%
93kg	Wierzbicki Krzysztof	821.2	Gunhamn Erik	816.8	-4.4	-1%
105kg	Krawczyk Bryce	756.2	Coimbra Anibal	854.3	98.1	13%
120kg	Tuchscherer Michael	819	Barkhatov Maxim	854.3	35.3	4%
120+kg	Gillingham Brad	826.7	Gillingham Brad	876.3	49.6	6%
TOTAL						
59kg	Fedosienko Sergey	1457.3	Fedosienko Sergey	1677.7	220.4	15%
66kg	Aryanto Viki	1440.7	Gladikh Sergey	1796.8	356.1	25%
74kg	Hrynkevich-Sudnik	1570.8	Olech Jaroslaw	1995.2	424.4	27%
83kg	Gibbs Brett	1764.8	Bakkelund Kjell Egil	2077.9	313.1	18%
93kg	Wierzbicki Krzysztof	1868.4	Inzarkin Dmitry	2204.6	336.2	18%
105kg	Belkin Yury	1912.5	Dovganyuk Vadym	2316	403.5	21%
120kg	Bouafia Mohamed	2083.4	Rokochiy Oleksiy	2370	286.6	14%
120+kg	Summer Blaine	2210.1	Christensen Carl Yngvar	2711.7	501.6	23%

prediction is that the recent and enormous growth of raw lifting probably means that one-ply lifting may well fade in popularity, leaving raw and fully-gear lifting on each end of the spectrum. However, to return to our auto racing metaphor, we do not see gear totally disappearing, because like the love of high-end speed, the human fascination with maximal performance, even technologically enhanced performance, remains unquenchable. There are gear-heads in auto-racing just as there are gear-heads in powerlifting; both are fascinated by the technology available to them.

Whether powerlifting will continue to be considered a “human sport” like track and field and Olympic weightlifting, however, deserves further consideration. We can appreciate the technology of auto-racing because the autos are the athletes. In equipped powerlifting — which continues to become more extreme — we *transform* performance through what French philosopher Jacques Ellul would call “technique.”¹⁰¹ (Ellul’s *The Technological Society* was a philosophical exploration of the possible impact of technology on our future.) Ellul defined technique broadly, writing not only about machines and technical devices, but also about a

mindset he saw emerging in the mid-twentieth century. He believed that this particular aspect of technique — the desire to be faster, stronger, more efficient, and so on — was outgrowing human control and would make it impossible to control individual technologies.¹⁰² Geared powerlifting certainly seems to fit Ellul's definition. The "strength of the muscles alone," does not really matter to many powerlifters; what fires their imagination is what miraculous performances muscle and PEG can produce together.

Editors' Note: As historians and former lifters who embrace sport for more traditional reasons — the love of competition, the pleasure of achievement, and for what sport teaches us about our human limits — we wonder if future historians will one day write about this era of rampant gear in powerlifting and ask: "Why weren't geared powerlifters sufficiently self-aware to realize that the only people who didn't shake their heads and smile at them — with their bodies imprisoned inside their amazing gear — were their geared brethren?" And, "How did they fail to notice that they had become not musclebound but gear-bound?"

*The brilliant amateur historian of strength David P. Willoughby, who specialized in comparing men and women of different sizes, eras, and even different lifts or feats of strength, reviled the effect of anabolic steroids, which laid waste to his lifetime study of the comparison of human capabilities regardless of date, feat, and body size. Near the end of his long and productive life, Willoughby witnessed the coming of Performance Enhancing Gear," and told us in the late 1970s that he feared, "These new suits may have a greater effect on records than even steroids had."*¹⁰³

Willoughby's fears appear justified. Tiny Meeker's PEG-assisted bench press of 1102 pounds (500 kilos) is 286 pounds more than the IPF world record in the deadlift, the lift which — prior to the coming of supportive gear — always allowed a lifter to far exceed the poundage of his heaviest bench press, and almost always allowed a lifter to exceed his highest poundage in the squat.

Even so, over the past few years we've witnessed something far more significant than a simple turning of the tide. We've seen a sea change. How else can we explain the astonishing number of raw lifters at the USAPL Raw Nationals, and that of the 118 lifters in the 2015 Longhorn Open 100 of them lifted raw. Could it be that PEG will go the way of the corset?

NOTES

1. Robert L. Simon, *Fair Play: The Ethics of Sport*, Third Edition (Boulder, CO: Westview Press, 2010), 25.
2. Brad Partridge, "Fairness and Performance-Enhancing Swimsuits at the 2009 Swimming World Championships: The 'Asterisk' Championships," *Sport, Ethics & Philosophy* 5, no. 1 (February 2011): 63–74; Matthew McCormick, "Soaring to New Heights: The Evolution of Pole Vaulting and Pole Materials," *Illumin* 12, no. 2 (2010), viewed at: <http://illumin.usc.edu/143/soaring-to-new-heights-the-evolution-of-pole-vaulting-and-pole-materials/>; Sigmund Loland, "The Ethics of Performance-Enhancing Technology in Sport," *Journal of the Philosophy of Sport* 36, no. 2 (October 2009): 152–161; Pam R. Sailors, "More Than a Pair of Shoes: Running and Technology," *Journal of the Philosophy of Sport* 36, no. 2 (October 2009): 207–216; Thomas M. Hunt and Jan Todd, "Powerlifting's Watershed: Frantz v. United States Powerlifting Federation: The Legal Case That Changed the Nature of a Sport," *Iron Game History, The Journal of Physical Culture* 9, no. 3 (February 2007): 7–19; Heather Sheridan, "Tennis Technologies: De-Skilling and Re-Skilling Players and the Implications for the Game," *Sport in Society* 9, no. 1 (2006): 32–50; Claudio Marcello Tamburrini and Torbjörn Tännjö, eds., *Genetic Technology and Sport* (London: Routledge, 2005); George Khushf, "The Use of Emergent Technologies for Enhancing Human Performance: Are We Prepared to Address the Ethical and Policy Issues?" *Public Policy and Practice* 4, no. 2 (2005): 1–17; Andy Miah, "From Anti-Doping to a 'Performance Policy' Sport Technology, Being Human, and Doing Ethics," *European Journal of Sport Science* 5, no. 1 (2005): 51–57; Carl Elliott, "Enhancement Technologies and Identity Ethics," *Society* 41, no. 5 (August 7, 2004): 25–31; Andy Miah, "Is Bigger Better? A Response to the International Tennis Federation's 'Bigger Balls' Proposal," *International Sports Studies* 24, no. 2 (2002): 19–32; Sigmund Loland, "Technology in Sport: Three Ideal-Typical Views and Their Implications," *European Journal of Sport Science* 2, no. 1 (2002): 1–11.
3. USA Powerlifting (USAPL), the most prominent powerlifting federation in the United States, reportedly had 8,371 members in 2014 according to the 2015 USAPL minutes viewed at: www.usapowerlifting.com/wp-content/uploads/2014/01/2015-NGB-Minutes.pdf.
4. Stewart Ross, *Sport Technology* (London: Evans Brothers, 2010), 11–12, 15.
5. We understand that some similar sports — such as weightlifting — are part of the Olympic family, and that membership in that family confers significant prestige and economic advantage that mandate the existence of only one federation and set of rules.
6. Jan Todd and Terry Todd, "Reflections on the 'Parallel Federation Solution' to the Problem of Drug Use in Sport: The Cautionary Tale of Powerlifting," in *Performance Enhancing Technologies in Sports: Ethical, Conceptual, and Scientific Issues* (Johns Hopkins University Press, 2009), 65–76.
7. "Compare Powerlifting Federations," viewed at: www.powerliftingwatch.com/compare-federations.
8. Jan Todd, "Chaos Can Have Gentle Beginnings: The Early History of the Quest for Drug Testing in American Powerlifting: 1964–1984," *Iron Game History: The Journal of Physical Culture* 8, no. 3 (May–June 2004): 17–18.
9. The APF uses the rulebook of its parent organization — the World Powerlifting Congress. World Powerlifting Congress, *Official Rule Book* (2015 Edition), 1, viewed at: http://worldpowerliftingcongress.com/wp-content/uploads/rules/WPC_Rule_book_Official.pdf.

- 10.
11. Justin Blatnik, Jared Skinner, and Jeffrey McBride, "Effect of Supportive Equipment on Force, Velocity, and Power in the Squat," *Journal of Strength and Conditioning Research* 26, no. 12 (December 2012): 3204-3208.
12. Doug Daniels, "Lifting Equipment," *Powerlifting USA*, January 1988: 32.
13. "The Leviathan," viewed at: www.inzernet.com/detail.asp?PRODUCT_ID=LEVIATHAN_CANVAS.
14. Ibid.
15. "All Time Historical Men's Powerlifting World Records in Pounds/Kilograms," *Powerlifting Watch*, 24 March 2014, viewed at: www.powerliftingwatch.com/files/PLWR-M-03-23-14.pdf.
16. Doug Daniels, "Knee Wraps," *Powerlifting USA*, September 1994: 22.
17. It is, in fact, quite common for the helper's knuckles to be scraped raw when trying assist a lifter into a Super Suit. Inzer Advance Designs advertisement, viewed at: www.inzernet.com/detail.asp?product_id=FITGLOVE.
18. "Leviathan Ultra Pro," viewed at: https://www.inzernet.com/detail.asp?PRODUCT_ID=Leviathan_Ultra_Pro.
19. Larry Miller, "Bench Press Shirts: A Reply to Dr. Sal Arria's Article in the December 1996 *PLUSA*," *Powerlifting USA*, June 1997: 24.
20. Post by "cwb" on Testosterone Nation, viewed at: http://tnation.t-nation.com/free_online_forum/sports_body_training_performance_bodybuilding_strength/bench_shirts_a_powerlifting_gear_guide. "Fury" is a brand name for a bench shirt made by Titan Support Systems, Inc., viewed at: www.titansupport.com/products/bench-shirts/fury-bench-shirts.
21. Comment by UHCougar05 on Testosterone Nation, viewed at: http://tnation.t-nation.com/free_online_forum/sports_body_training_performance_bodybuilding_strength/bench_shirts_a_powerlifting_gear_guide.
22. Jack Kane, "NASCAR Cup Engines to Formula One Engines: How Do They Compare?" *EPI Inc.*, 18 November 2011, www.epi-eng.com/piston_engine_technology/comparison_of_cup_to_f1.htm.
23. The Titan Company is run by Pete Alaniz Jr. in Corpus Christi, Texas, viewed at: <http://titansupport.com/blog/about/> for a history of the company. See also the ad for the Titan Centurion, viewed at: www.titansupport.com/products/squat-suits?mode=list.
24. Wrist wraps are primarily stabilizers. These heavy bandages, made of material similar to that used in knee wraps, help keep the wrist in proper position when squatting and bench pressing. Doug Daniels, "Powerlifting Gear Primer," *Powerlifting USA*, July 1998: 19.
25. "Why do deadlift suits not help as much as squat suits and bench shirts?" viewed at: www.reddit.com/r/weightroom/comments/z4i0s/why_do_deadlift_suits_not_help_as_much_as_squat/.
26. Interview with Kim Beckwith, 17 October 2013; "First Time In a Bench Shirt," *Powerlifting Watch*, 27 March 2006, www.powerliftingwatch.com/node/1628.
27. John Fair, *Mr. America: The Tragic History of a Bodybuilding Icon* (Austin: University of Texas Press, 2015), 73.
28. Peary Rader, "Powerlifting How It All Started: Part 1," *Iron Man* 42, no. 4 (May 1983): 59-60.
29. Rader, "Powerlifting How It All Started Part 1.," 59-60; M.L. Kirchner, The 'Mr 1949' Contest and Professional Championships, *Iron Man* 9, no. 5 (September-October 1949): 6-12; Peary Rader, "The New Prof. Association," *Iron Man* 9, no. 5 (September-October 1949): 22-23 & 42-46.
30. Rader, "The New Prof. Association," 22.
31. Peary Rader, "Powerlifting How It All Started, Pt. 2.," *Iron Man* 42, no.5 (July 1983): 48. See also: David P. Willoughby, *The Super Athletes* (South Brunswick, NJ: A.S. Barnes, 1968), 130-131, for a list of records in these lifts that includes some of these made in this early era.
32. Rader, "Powerlifting, Pt. 2," 48-49.
33. John Terlazzo, "Powerlifting," *Muscular Development* 1, no. 11 (November 1964): 8-9; and John Terlazzo, "1964 National Powerlifting Tournament," *Muscular Development* 1, no. 12 (December 1964).
34. John Terlazzo, "Results of the 1965 Senior National AAU Powerlifting Championships Held in 'Muscle-town,' PA," *Muscular Development* 2, no. 12 (December 1965): 14-18, 54-58.
35. Ralph Countryman, "Close Battles Spark First Senior Nat'l Power Lift Championships," *Iron Man Lifting News*, November 1965: 10-18.
36. Ibid., 11.
37. Ken E. Leistner, "Wraps, Suits, and Shirts - Some History," *Strength-Old School*, 8 January 2010, viewed at: www.strength-old-school.com/topic/117-wraps-suits-and-shirts-some-history/.
38. Ibid.
39. Mike Lambert, "The GREATEST Lift I've Ever Seen," *Powerlifting USA* 1, no. 1 (June 1977): n.p. It is certain that Lambert refers to Overholtzer, despite not mentioning his name, because Lambert refers to Olverholtzer's record-breaking 655-pound squat. See Peary Rader, "14 Records Made at Sr. National Power Lifting," *Iron Man* 28, no. 1 (November 1968): 42. Also, note that the title of Lambert's article refers to a 695-pound squat performed by George Frenn, which, although not a record, was comparatively more impressive to Lambert than was Overholtzer's lift.
40. Ibid.
41. Herb Glossbrenner, "Has Powerlifting Become a Mockery of Strength?" *Powerlifting USA*, November 1994: 12.
42. Ken E. Leistner, "Wraps, Suits, and Shirts."
43. Peary Rader, "Power Lifting Dilemma," *Iron Man Lifting News* 15, no. 1 (December 1968): 3.
44. Ibid.
45. Ibid.
46. Countryman, "Close Battles," 11.
47. Ralph Countryman, "Senior National Powerlift Championships in Los Angeles," *Powerlifting USA*, January 1969: 4-13.
48. Ibid.
49. Clay Patterson, "AAU National Convention," *Powerlifting News*, December 1972: 23.
50. Ibid.
51. Ibid.; For a more detailed account of this event see, Todd and Todd, "Reflections on the Parallel Federation Solution," 44-88.
52. "Readers Write: Bring the Wraps Back," *Powerlifting News*, March-April 1973: 33.
53. Hollie Evett, "Wraps," *Powerlifting News*, January 1973: 5.
54. Dave Krieg, "Readers Write," *Powerlifting News*, March-April 1973: 33.
55. John Terlazzo, "Powerlifting News," *Muscular Development Magazine* 11, no. 3 (March 1974): 14-15, 63-64. Items E and F under Bandages limited the use of spot plasters (Band-Aids) on the hands and thumbs. The 1973 IPF World Championships marked the last time that lifters competed internationally in shorts and T-shirts.
56. "Newsmaker," *Powerlifting News* 1, no. 3 (April 1972): 3.
57. Personal knowledge of authors, Jan and Terry Todd.
58. This contradicts the generally accepted idea that the first "Super Suits" were made by George Zangas. Interview with Larry Pacifico,

