

# Ironman Articles

## 1970-1974

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## And Then The Bomb

After several pages devoted to a description of his struggles to establish himself in the gym business, the writer of a recent letter said, "... I think I was on the right road, publicity, equipment, etc. And suddenly the Arthur Jones bomb drops."

In my reply, I said, "...regarding your near-final comment about the Arthur Jones bomb – I would advise you to be well prepared for ANYTHING; we haven't dropped our heavy ammunition yet – but I promise you, it will shake the weight-training field to its roots. If this has caused you – or does cause you – personal difficulty, then you have my sincere apology; it is not my desire to hurt anyone – but progress had to come in this field as in any other. It was just a matter of time, and it was certainly about time. If I had not been the source of that change – then somebody else eventually would have been. And in any situation of change, somebody always gets hurt."

Many other letters – literally hundreds of other letters – have come from all over the world, from almost every state in the union, from Africa, from Europe, from Australia, and even from Asia; and while it is simply impossible for me to write long, detailed responses to all of them immediately, I will get around to answering each individual letter eventually – and in the meantime, I am trying to answer the most common-asked questions in my articles.

Yet I find myself in a rather paradoxical situation; while I am now clearly aware of a trend that will lead the entire field of weight training in an almost entirely new direction, I cannot – for various reasons – immediately publish all of the information available to me.

To begin with, if the conclusions that have forced themselves on my awareness only after thirty years of interest were suddenly presented intact, but without clearly supporting, undeniable evidence, then many people would simply refuse to accept these conclusions.

But, on the other hand, these conclusions cannot be supported in brief, simple-to-understand manner; most of the people in greatest need of the information made available to them for the first time as a result of our work are unfortunately not able to understand a technical explanation – and it is thus unavoidably necessary to present our conclusions, and the reasoning behind those conclusions, in a manner calculated to induce rather wide-spread acceptance, rather than actual understanding.

But then, after all, how many people really understand how their cars work, either? Very few; but that doesn't prevent millions of people from making at least practical, if perhaps not full, utilization of their automobiles.

Within the last week, a man from a nearby state visited Deland for the purpose of picking up two machines that he purchased from us, and while he was here he remarked that he had previously photographed and then tried to duplicate one of our machines – unsuccessfully, as it turned out; which wasn't a very surprising result, since what he was trying to do was almost literally impossible.

Which fact he clearly understood – after it was explained to him. And while there was nothing dishonest about this attempt to build one of our machines for private use, another such attempt involved outright theft; somebody – and I think I know which somebody – stole one of our spiral pulleys, probably planning to duplicate it and build his own machines. But I am afraid he is in for a bit of a surprise; because, the pulley is of absolutely no value by itself – nor can it be used unless certain other vitally important points are known.

For example; with nothing to point it out to him, just how does he propose to determine the "departure point" of the spiral pulley – and how far away is the axis of the first redirectional pulley – and in what direction – and what is the radius of the first redirectional pulley? Lacking any one of those required bits of information, the spiral pulley – even with the other required information – is totally useless, it becomes a bit of worthless twisted metal.

And that, of course, is only the start; the overall geometry of the machines is not a random arrangement of parts – and changing any one factor, even slightly, changes the entire geometry, and thus the function. And if you think not, then just stick your head into the required reading matter long enough to become at least basically familiar with the characteristics of spiral pulleys. And any similarity to round pulleys is purely coincidental; the size of a round pulley, its

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location, its angle of departure, its relative positioning in regard to redirectional pulleys, etc., is of no slightest importance – a round pulley is a round pulley is a round pulley, its moment arm is always the same no matter what you do to it just short of bending it with a sledge hammer.

But when you start dealing in such matters as “effective angles of departure,” as opposed to actual angles of departure – and “effective moment arms,” as opposed to actual moment arms – and when you find yourself in the position of trying to design a pulley with a shape that will permit the cable to effectively pass inside the pulley’s perimeter, then you will have at least a slightly better idea of what I am talking about.

One of the problems that we encountered is so seemingly difficult that I have now devoted more than two years of thought to the matter and still do not even know if the problem can be solved; this problem involves – for its solution, if a solution proves to be possible – an understanding of both physiology and math. And so far, the mathematicians that have been made aware of the problem, and that might be able to solve it, are unable to understand the problem – and the physiologists that we have contacted, people who usually do understand the problem after it has been explained to them, don’t have the required ability in math. It may literally be an impossible problem – but at this point I would welcome even that information, since it would be a solution of sorts; as things stand now, it is a highly intriguing, but very frustrating question.

But before your overconfidence leads you into trouble, I will point out that some of the leading physiologists and mathematicians in this country have already looked at the problem – and up to this point, without a single exception, they have declined to even offer an opinion. And I am fairly certain that several of them remained glassy-eyed for several days after first hearing the problem.

The problem? Well, you asked for it.

Given the balanced strength curve for isolated contractile function of the biceps – as well as the balanced strength curve for isolated supinational function of the biceps – how do you double-balance the perimeters of two separate spiral pulleys, each of which provides the required variation in moment arm for separate sources of resistance, when the supinational resistance source is affected by the contractile movement, which movement imparts 158.4 degrees of rotational movement to the round pulley which drives the supinational-resistance source spiral pulley on a common axis?

Since the act of contracting the arm increases the contractional strength, and since the act of supination increases the supinational strength, and since the act of contraction also increases the supinational strength, and since the act of supination also increases the contractile strength, it is – for the purposes of building an almost 100% effective compound-curling machine – necessary to double-balance the two separate sources of resistance provided each arm.

In effect, if the two sources of resistance (actually three sources of resistance, since there is only one, common source of contractile resistance for both arms, and two separate sources of supinational resistance – one clockwise, one counter-clockwise) are double balanced (balanced in relation to each other), then it is literally impossible to make significant movement in either direction without almost exactly corresponding movement in the other direction. You would find it impossible to “bend” the arms without also “twisting” the forearms – or vice versa; because, unless you supinated in similar degree, and simultaneously, you would not have the strength to contract – and vice versa.

But since the only apparently practical manner to construct such a machine involves the use of supinational sources of resistance driven by flexible shafts, and since the contractile movement of a machine designed in this manner will be reflected in a direct one-to-one ratio in movement of the round pulley which must be first driven by the input of applied force, and since there is at least a practical if perhaps not a theoretical limit to the number of coils that can be incorporated into even the perimeter of a compound spiral, it obviously follows that the contractile movement is directly affecting (at least to some degree) the supinational resistance source, thus adding “something” to the contractile resistance and subtracting something from the supinational resistance source, and doing “who knows what” to the carefully-established double-balance situation.

And even though we have the availability of a computer that can give us the exact pulley shapes required – if we know what to feed it – we find ourselves at a dead stopping point.

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So, Dear Somebody Out There, if you understand the problem as stated (and if not, and if you have the required background, we can make it clear to you), and if you think you have even a possible solution – then we would be more than happy to hear from you.

And while the above problem outline was included in this article as an example of the type of problems we have encountered, it was also meant to be a cry for help – and we really need help on this one.

And from all present appearances, by the end of this year we will be getting additional help from at least twenty-five major research programs being undertaken by universities, medical schools, and research foundations – all of which programs will be based on the functions and applications of the new machines. The results of which work will eventually be published in one form or another.

Some related problems will probably never be solved – others will be solved only long in the future; but in the meantime, quite a bit is already very clear to us – at least for practical utilization purposes – and much of this information can be put to very good use.

In previous articles, I have repeatedly stressed the requirement for maximum-possible “intensity of effort;” I have stated that each set of every exercise must be carried to a point of utter failure. Yet, the truth of the matter may well be – probably is – that “something less” than such maximum-possible effort would produce equally good results. That is to say; MAYBE you can produce best results WITHOUT doing your exercises to a point of failure. However – and let there be no slightest doubt on this point – if that should be the case, then it is a point that will never be proven; and even if proven, it would still be of no slightest value – because, even in possession of such information, just how do you make practical use of it? How do you measure it? How do you know when a particular set has reached the required percentile of maximum-possible effort?

Secondly, once a trainee is aware that “anything less than” a maximum effort is all that is required, the natural tendency in almost all cases will be to reduce efforts far too much. After all, if told in advance that an upcoming test will be limited to the information contained in the first chapter of a particular book, just what percentile of students will study anything more than that one chapter?

So, even if maximum-possible effort isn’t a requirement (and I personally feel very strongly that it is, or that any difference is insignificant), such knowledge, if it comes, obviously must remain “unusable information” in light of the fact that there is no practical means of measuring such percentages.

And please be kind enough not to call my attention to the machines which “record” performances; for reasons which I will not go into here, that type of machines does not answer the requirements mentioned above – although, from what I have heard of such machines, from sources which I consider reliable, it does appear that such machines are a significant improvement over conventional forms of training.

And too, if you think that solving all (or most) of the related problems introduced by changing and random moment-arm factors unavoidable in all forms of barbell and/or other conventional forms of exercise was somewhat difficult, then give thought for a moment to the fact that ALL moment-arm factors involved in exercise are not the result of the equipment being used; what about the changing moment-arm factors produced by “angles of insertion” of various muscles and their attachments? And just what do you propose to do in the way of altering that situation?

Unclear? Well, it won’t be in a moment. In previous articles, I have attempted to clearly – and hopefully quite simply – point out the fact that muscles are stronger in some positions than they are in other positions. And now I will tell you “why” this is true.

In an extended position, the “angle of insertion” of the involved muscles is such that the production of much in the way of usable strength is all but impossible – because a very high percentage of any force expended does not contribute to the rotational movement that must be produced for body-part motion; instead, a large part of such effort is literally wasted – since it is pulling in a direction nearly 90 degrees out of phase with the direction of desired movement, the only possible direction of movement.

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Later in the movement, the angle-of-insertion is far more favorable – and then a very large part of the total amount of force being expended is going directly into the work of rotating the involved body part.

But as movement of the body part passes this point of most-favorable angle-of-insertion, it then returns to a situation where the angle-of-insertion is unfavorable – although it will never return to a degree of ineffectiveness equal to that experienced at the start of the movement.

At the end of the movement, the moment-arm resulting from the angle-of-insertion will be such that a fairly high percentage of the force being produced by the muscles is again being wasted – is not exerting its pull in the proper direction. Thus – in the fully contracted position – MORE input of power is required to produce an EQUAL amount of usable strength. By comparison to input/output ratios produced in the most-favorable position.

Thus, in order to avoid a marked decrease in strength in fully contracted position, the muscle literally must be capable of exerting more strength in that position – and it can.

The area of the muscle that contains the highest number of strands of muscular fibers is thus involved in the contraction only in a position of full contraction – for the reason outlined above.

And while a similar problem exists in the fully-extended position as well, there is literally nothing the body can do about solving that problem – since solving that problem would involve physical impossibilities.

Thus it should be obvious that a muscle is even stronger (or, at least even potentially stronger) than it might appear to be in the fully contracted position; but while it can be strongest in that position, a great deal of such strength is not usable – or, at least, would not be obvious in any normal sort of strength tests.

And as I have done in previous articles, again I hasten to point out the fact that we don't even pretend to know the answers to related problems – but we are, at least, aware of a lot of them.

One medical school that contacted me recently was interested in conducting exercise experiments directed towards attempting to determine the degree of effect produced in a “left” arm when exercise was limited to a “right” arm; a research foundation that I am working in association with is starting to work on a project hopefully intended to throw some light on the subject of just what effect physiological improvement has on trainees in a psychological way; a major western university may undertake comparisons of the results produced by our new equipment and conventional training devices; a doctor in California is undertaking similar research – and so on. And in the meantime, our research and development work goes on here.

Our interests are many and varied, and we will sincerely welcome help – or even critical examination – by anybody that even might be qualified to do so; we do not care what the final truth turns out to be – and the source of any information is of no slightest concern.

If you can literally tear our theories to threads, fine – we will welcome such a result; because, if we are on the wrong track, then we certainly want to become aware of such an error. And perhaps we can each learn from the other.

While I have certainly not been slow to be critical of a large part of the scientific community in the past (and while some of my comments might have been a lot more critical than they actually were by the time they appeared in print – having had the hatchet applied at a point between my typewriter and the printed page), I think that I have been clear on the point that I do not consider ALL scientists hypocrites. And if you really want to hear some critical comments, attend the next meeting of scientists – in any field – and lend an attentive ear to their comments about other people working in areas related to their own fields of specialization. And don't be surprised at a good part of the language you will hear – scientists can be specific in more ways than one.

Quite frankly – and this is perhaps an admission that I would be well advised to keep to myself – I have purposefully been critical of some scientists; in an effort to attract their attention to a field of study which I consider important – and if this can only be done by arousing their indignation, so be it. As the kindness-expert said after he hit the mule across the head with a club, “...first you must get their attention.”

## The Arthur Jones Collection

And if nothing else, we have apparently attracted their attention – which is well and good, since that was what we were trying to do.

And just what does all of this mean to the average bodybuilder? Well, to begin with, it means that people – a lot of people – who are qualified to conduct meaningful research are now working in the direction of trying to improve both the methods and the applications of these methods available for increasing strength and/or muscular mass. It means that the bodybuilder is no longer limited to advice put forward by people who simply don't know what they are talking about – people who may have perfectly good intentions, but little if anything in the way of meaningful information. Sincerity is no proof of knowledge – or even good intentions; I have known some very sincere burglars – and if a man runs at you with an axe, you better believe he is sincere.

And since the results of this work – even at this rather early point – are already such that very significant improvements can be provided by practical applications of recent discoveries to presently-practiced training schedules, any bodybuilder desiring to reach the top should at least attempt to follow developments as closely as possible; because, in the near future, like it or not, understanding the significance of these developments or not – he will be forced to compete with people who do at least understand the practical significance of these discoveries.

And if your interest is limited to almost-simple-minded articles devoted to sets and reps – with no mention of how to perform the exercises, and why they should be performed that way (or, if any attempt is made in the direction of an explanation, with statements being restricted to parroting of obvious nonsense) – then, my friend, you are about to be in trouble.

And while it would EASILY be possible to immediately point out at least five-hundred so-called “facts” that are held to be self-evident truths by almost every bodybuilder on planet Earth – but which, in fact, are the exact opposite of the truth – to do so would probably have anything but a desirable effect in most cases.

After all, a man can only absorb so much at any one time – and if you tear down his entire world of beliefs, you may well destroy him entirely. Secondly, while such things could be stated very briefly, they could not be explained to the satisfaction of very many people without going into such length of explanation that the attention span of most people would be far exceeded.

Even if they had the required background such explanations would entail.

You think not? Well, mull over these few points: (1) the easier a particular repetition within a given set seems, the harder it actually is, (2) the first, seemingly easiest, apparently safest, repetition in a set of ten repetitions leading to a failure during an attempt to perform the tenth repetition and involving an all-out effort is 144 times (on the average) as dangerous as the final, tenth repetition (3) the amount of force involved in such a set of curls using a 100-pound barbell would be approximately 1,000 pounds in the first repetition and about 80 pounds in the tenth repetition – a ratio of about 12 to 1 – and the “danger factor” would be calculated by squaring the force ratio, or twelve times twelve, 144.

Or – do you really believe that “wide-grip” chins stretch your lats more than narrow-grip chins? If so – wrong again; such a wide hand spacing literally makes much in the way of stretching impossible.

And why do you turn your palms forward (pronate the forearms) while performing behind-neck pulldowns? Since such a hand positioning reduces the strength of the upper arms to the lowest possible level – and thus reduces the degree of producible results from this exercise by at least 70%. Since the arms are already too weak to provide much work for the much stronger torso muscles involved in this movement – and since you are limited insofar as torso muscle development is concerned by the strength of the arms (or the lack-of-strength of the arms). And yet you make a bad situation far worse by putting the arms in an even-weaker position than necessary.

And do you really think that the calves and forearms are some of the “hardest” areas of the body to develop? While, in fact, they may well be the easiest areas to develop to their maximum potential sizes. Shall I go on? No, I think not; if the above is not enough food for thought at the moment, then I have nothing to teach you in any case – and if it is, then

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I must not make the mistake of destroying too much of your world of beliefs at any one time. But stick around for another year or two, and eventually we'll get around to everything you ever heard on the subject of physical training – and quite a number of things that I absolutely guarantee will be totally new, and very significant.

And who knows – it might even turn out that you are right about “something.” And wouldn't that be a satisfaction of a sort?

But even if – as it probably will – it turns out that you are right about quite a number of things, it certainly won't hurt your thinking to correct any efforts that do exist, and it won't hurt your training progress, either.

And besides, do you really like training twenty hours a week – while taking ten years to get the same degree of results that you should have produced in two years, or less, while training only about four hours a week?

And do you really think that you can adjust the laws of physics to suit yourself – or ignore them without peril?

And as I said at the start of this article, if you intend to stay in the bodybuilding field – then be prepared for literally ANYTHING; we really haven't dropped our heavy ammunition yet – but the bombers are on the way.