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The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don't know which ones.

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Tokens of fame and fortune. Photomontage: A.S. Kaswell.

On the Back Cover

A slug takes a leisurely, if perilous, stroll on a bicycle path in Hobart, Tasmania, August 2005, as part of the Ig Nobel Tour of Tasmania. Photo: S. Drew.

Coming Events

(see WWW.IMPROBABLE.COM for details of these and other events)

St. Cloud State Univ. -- JAN. 17, 2006

AAAS Annual Meeting, St. Louis -- FEB. 17, 2006

Ig Nobel U.K. Tour -- MARCH 2006

The Netherlands -- MAY 2006

Ig Nobel Australia Tour-- Aug. 2006

Alpbach, Austria -- Aug. 2006

Ig Nobel Prize Ceremony -- OCT. 5, 2006

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Bodybuilders Have Tiny Testes

by Emeritus Professor Sam Shuster, MD, PhD, FRCP
Consultant, Dept of Dermatology, University of East Anglia, U.K.

This piece of work presented itself by accident. As a retired clinical scientist, I waste time worrying about problems I've opened and left unclosed. One such is stretch marks,[1] and the body bulk that produces them. Would body builders carry some of the answers? These massive men downloaded with sylph-like ease, but then ousted the original problem with a bigger one, albeit of smaller amplitude: it was immediately and inescapably obvious that the bodybuilder's crutch was mostly apparent by its absence – in short, bodybuilders appeared to have small balls.

Platitudes are what we learn from experience: there are lies, damned lies and clinical impressions, and a clinical hunch is poor evidence of its reality; I needed hard evidence. I needed to see body builders, but the responses, some of which were polite, made it clear that my study would have to be indirect. Fortunately, research is easier when its limits are defined: the trick was going to be how to measure changes in the male genital trio, the "meat and two veg" of this scientific meal, when it is covered and presented as an image.

Materials and Methods

I was downloading images of male ballet dancers and models from catalogues of swim- 'and underwear, for comparison, when my wife appeared with a coffee. She wanted to know whether there was an unexpected marital problem, and departed with the view that both the project and I were nuts, and that I might now be on a police list of dubious old men. The pursuit of science has always had its problems and, in recompense, it consoles me to think I may have gained some colleagueship with a forebear as distinguished as Galileo, who had also spent much time observing the spheres.

I played with the images to decide what methods of quantification might be possible. Three dimensional assessments using width of the shadows of the genital mountain failed, because lighting and position were not standardised. So a two-dimensional frontal presentation was accepted; genital mass could easily be measured by its cross-sectional area, as marked circumferentially

In defining the genital area I was particularly struck by one man: in contrast to a massive frame, his genital triangle was a disaster: something was missing. His genital bulge was mainly a central penile cylinder from which his briefs went steeply downhill, unimpeded by testicles between it and his crutch. As I stared in aimless wonderment, the defining feature of the bodybuilder's crutch suddenly became apparent (in science, you only discover what you first imagine): the normal, obtuse-angled V of the crutch is replaced by a narrow, acute-angled V. And this measure is simply obtained from the observed angle to the horizontal of each limb of the V. This was my Eureka moment -- for which the laptop has long replaced the bath.

Research is more *Tristram Shandy* than scientists might want to admit: here I was, all post-Eureka and ready to go, only to reach another diversion. Could what I'd

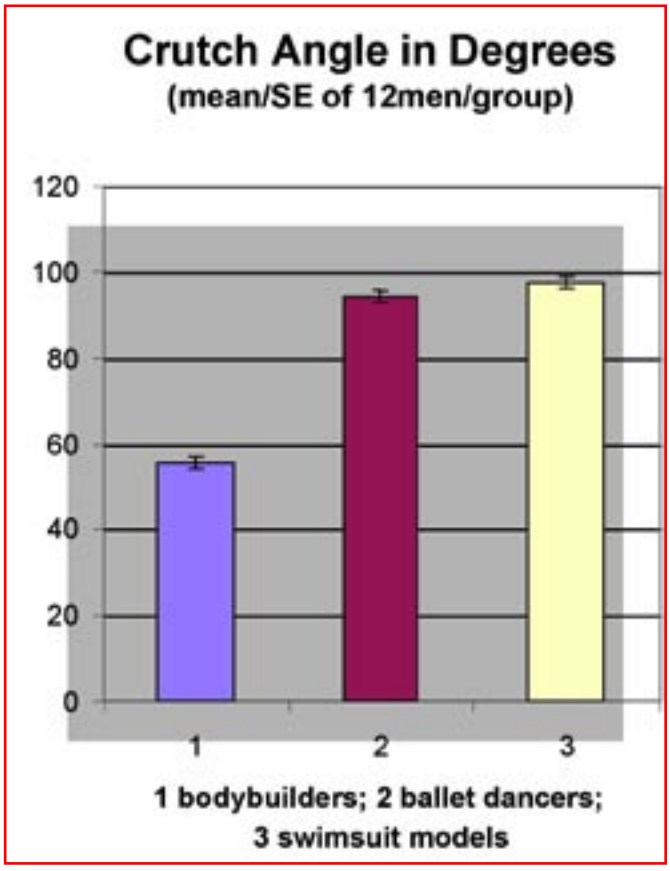


Figure 1. Crutch or genital volume, measured as a cross-sectional area in pixels, and expressed as a function of underlying muscle-free body size, measured as distance in pixels between each iliac crest. The columns give the mean and standard error for each group of 12 bodybuilders and swimsuit models, and shows that the ratio of crutch volume to underlying body size is greatly diminished in bodybuilders.

noticed simply be a visual artefact – had the crutch been made to look trivial by the surrounding mass of muscle? Absolute measurements could not be made, but weren't necessary anyway: far better to relate crutch dimension to the underlying skeletal body size, free of muscle mass. The iliac crests are obvious on the images, and because they are not covered by muscle, the distance between them provides a good, measure of underlying body size. Thus, the ratio provided by "correcting" genital area for the inter-iliac crest distance gives an absolute measure of genital size as a fraction of underlying body size, and would show conclusively whether the visually tiny testicles of bodybuilders are an optical or a biological artefact.

Measurements: From each group of images, the first 12 were taken that were frontal with little body rotation, and with legs together or only loosely apart. On each of them I made 3 independent measurements of crutch area, crutch V angle and inter-iliac crest distance, all in pixels, using the downloaded Image J program; agreement of replicates was good. Descriptive statistics were done for each group, and t-test comparisons were made between the bodybuilders and the other groups.

Results

The results are shown in Figures 1 and 2.

Genital area was remarkably less in bodybuilders than in men wearing swimwear briefs, and this difference was very significant; the same was true for their Genital V, or crutch angle.

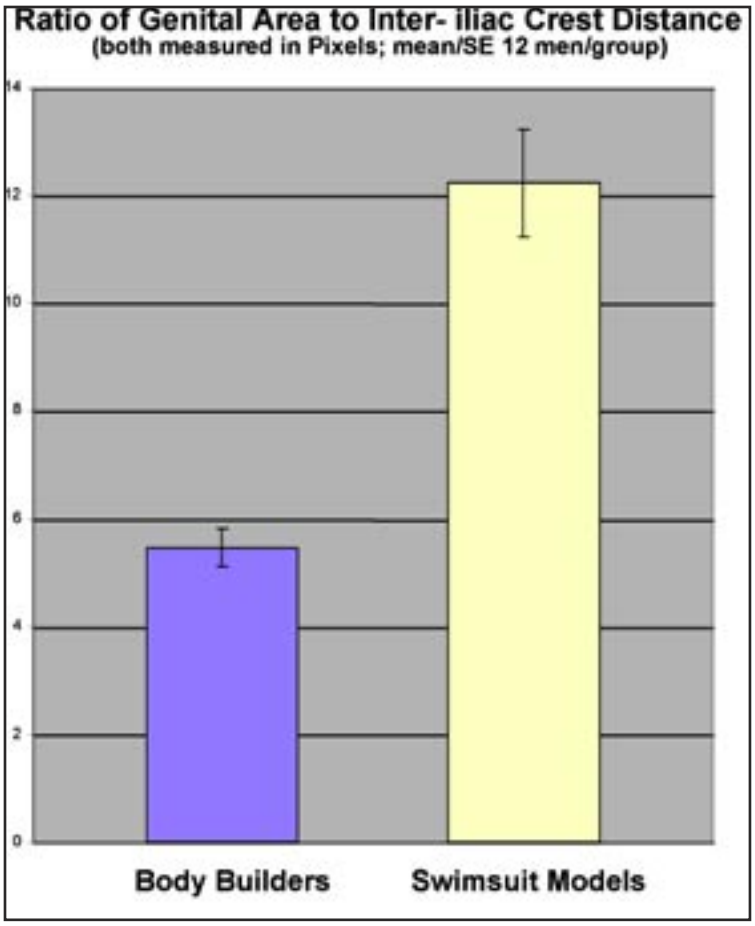


Figure 2. Crutch V or genital angle, measured in images of male bodybuilders, ballet dancers and swimsuit models. The columns give the mean and SE for each group of 12. The crutch angle is much less in the bodybuilders.

Discussion

Measurements on downloaded images show that bodybuilders have a much small genital area and Genital V angle.

Three dimensional measurements of genital mass could not be made, but cross-sectional area gives a reasonable approximation. Although these measurements can only be relative, by correcting them for underlying, intrinsic body size, using inter-iliac crest distance, an absolute measure can be obtained of crutch volume as a function of body size. This measure shows that the reduction in crutch size in bodybuilders is real, and is not simply a minimisation of the visual image by the surrounding mass of muscle. The reduction was seen by comparison with all groups; it is particularly significant for the swimwear group, because very similar briefs were worn and, unlike with underclothing, models appeared not to have been selected because of an ambitious crutch. And, whilst the tights worn by ballet dancers may have provided a somewhat different external crutch shape but not crutch size, it is more likely that dancers are chosen more for elevation of jump than genitalia. Thus the consistency of the findings throughout all other male groups adds to its significance, and allows the firm conclusion that bodybuilders have a small crutch. Unlike all the other groups, bodybuilders have virtually no subcutaneous fat; this will have artificially increased their crutch area ratio, making the observed reduction in crutch size an underestimate.

Discussion of the Discussion

To what is this reduction due? The images show that the reduction in genital mass is not due to penis size, but to tiny testes. Tiny testicles are also the immediate cause of the narrowing of the Genital V angle, which is such a striking feature of the bodybuilder's pose.

What explains this shrinkage of the bodybuilder's balls? Since it is unlikely that only men with small balls undertake bodybuilding, we have to assume that small balls are causally related to this activity. Could these crypto-orchids be an adverse consequence of the pathological amount of exercise necessary to produce the vast amount of muscle? Is there a functionally inverse relationship between testicle size and muscle mass? Did Delilah find more to Sampson than was made public? It is well known that extreme exercise affects the endocrine system: for example, it explains the small breasts of ice-skaters[2] [see "Ice Skaters Have Small Breasts," in this issue of *AIR*] and ballet dancers. But, of course, ingestion of male hormones, a not entirely unknown practice amongst sportspeople, turns off the secretion of pituitary trophins, leading to testicular shrinkage. Such a practice may be as strenuously denied as it is indulged.[3]

Of course, simple inspection, questioning and testing of bodybuilders could produce the answers. In the meantime, the reports that, despite their small balls, some bodybuilders have a libido which matches their immense body mass, clearly distinguishes between the two mechanisms, in them at any rate. Regardless of the uncertainties about an endogenous or exogenous mechanism, it is difficult to escape the conclusion that bodybuilders develop small balls, and, as they well know, small is not always beautiful. But if there is to be a government warning, where should it be pinned?

Acknowledgements

I wish to thank my wife for forbearance and the police for tolerance.

References

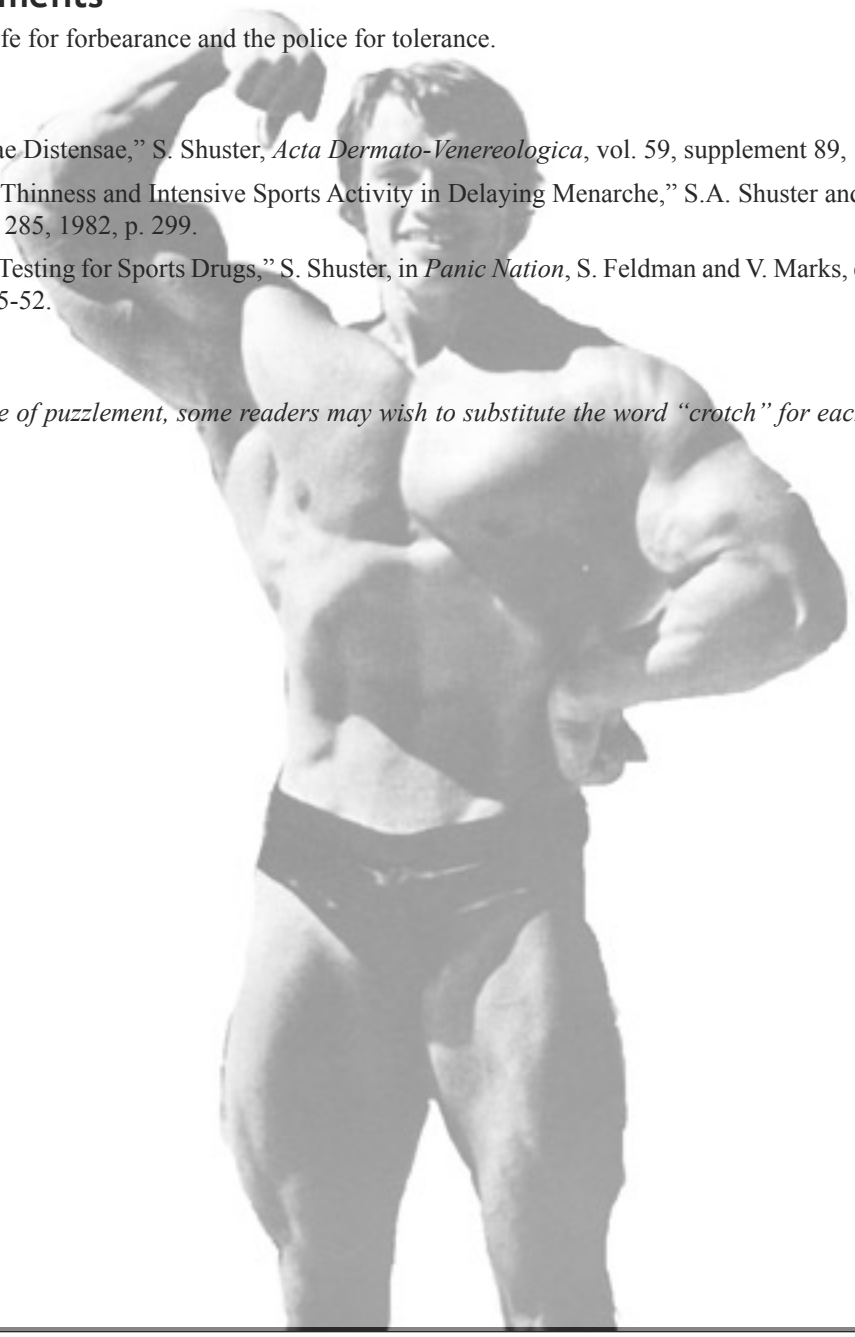
1. "The Cause of Striae Distensae," S. Shuster, *Acta Dermato-Venereologica*, vol. 59, supplement 89, 1979, pp. 161-9.

2. "Synergy Between Thinness and Intensive Sports Activity in Delaying Menarche," S.A. Shuster and S. Shuster, *British Medical Journal*, vol. 285, 1982, p. 299.

3. "The New Sport of Testing for Sports Drugs," S. Shuster, in *Panic Nation*, S. Feldman and V. Marks, editors, John Blake, London, 2005, pp. 245-52.

Note

[Editor's note: In case of puzzlement, some readers may wish to substitute the word "crotch" for each instance above of "crutch."]



Ice Skaters Have Small Breasts

by Bobbie Shuster and Sam Shuster
Framlingham, Suffolk, U.K.

Athletes from an earlier time also show the effect. These are two of the ten girls depicted centuries ago in the "Room of the Ten Girls" in Villa del Cassale, in Sicily.

One can observe that good ice skaters have small breasts. Yes, there are exceptions, but those are of small interest.

Our attention was drawn to this anatomical anomaly by our daughter, who found skating's early morning starts and evening continuations a great diversion, and time off school was easily obtained for what was considered to be an exotic sport, with mind-improving aesthetic components. By contrast, her poor parents sat miserable and cold at the rink-side, envious of the skaters' hot, despite thin, leotards, because of the fantastic energy expenditure of ever more spinning and jumping.

We knew all the skaters well, and saw their improvement, as we watched them grow from childhood to puberty. But the more we waited for its arrival, the longer it seemed to take. Then, finally, we began to notice how small the girls' breasts were, and that they stayed that way well beyond the pubertal landmark, regardless of the often inescapably obvious maternal genetic provision. Evidently the sport had prevented some things from developing (as we discussed in the *British Medical Journal* in 1982[1]), and in confirmation of this, when skating eventually stopped, breasts began sprouting like

plants in a greenhouse.

This small anomaly is not unique to ice-skaters; it occurs in other athletes, notably gymnasts and other high-energy sportswomen. For a good example, see the mosaics in the "Room of the Ten Girls", Villa del Cassale, in Sicily, which dates from the third or fourth century BC. The paired minimalism is, paradoxically, gross in ballet dancers, who retain small breasts throughout their dancing careers. In fact, you can classify ballet companies by the breast size of its corps de ballet – from the petite presentations of the "seriously classical" to the bigger bounce of the more contemporary companies.

What is the biomedical mechanism? Very high sports activity and body thinness delay puberty, but the persistence of the changes in figure skaters and ballet dancers indicates a continued effect, presumably of intense, muscular work. If so, this should be apparent in other physical occupations, particularly in parts of the world where labour conditions are severe. But however muscular work produces the changes, relaxing into the armchair of the converse will never become the poor person's silicone.

Reference

1. "Synergy Between Thinness and Intensive Sports Activity in Delaying Menarche," S. Shuster and S. Shuster, *British Medical Journal*, vol. 285, 1982, p. 298.