Clarification on a 'muddy point' of the Force-Velocity relationship

Muscles Active while Lengthening

Consider the example of ordinary exercise, lets say one of the running events in the Olympics. Muscle functions to stop the motion of the athlete as often as it does to start it. When a load larger than isometric tetanus tension To is applied to a muscle in a tetanic state of activation, the muscle lengthens at a constant speed. The surprising thing is that the steady speed of lengthening is much smaller than would be expected from an extrapolation of the Hill equation (recall the empirical hyperbolic relation) to the negative velocity region. In fact, Katz (1939) found that -dT/dv, the negative slope of the force-velocity curve, is about six times greater for slow lengthening than for slow shortening.

Another anomaly is that muscle 'gives', or increase length rapidly, when the load is raised above a certain threshold (the plateau and ultimate demise of the F-V curve). The 'give' becomes an an overwhelming effect, almost as if the muscle had lost its ability to resist stretching, when the load is about 1.8 To.

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