Gymnastics & Tumbling

Greg Glassman

This month we review a small yet dense out-of-print book titled *Gymnastics and Tumbling*. First published by the U.S. Navy in 1944, Gymnastics and Tumbling is today an obscure reference in danger of extinction. We believe it is an indispensable resource for CrossFitters and intend to keep it alive.

Shortly after the United States’ entrance into World War II, the United States Navy implemented a physical training program for future pilots based on training and practicing various sports: “Successful coaches were commissioned so that the Navy might have the best instruction available.” The successes, methods, and refinements of these coaches-turned-officers culminated in the issuance of the Naval Aviation Physical Training Manuals by the U.S. Navy in 1944.

The manuals were prepared by and for the newly commissioned officers from their experiences in teaching thousands of aviation cadets. Their titles include: *Hand-to-Hand Combat; Boxing; Wrestling; Football; Gymnastics and Tumbling; Soccer; Basketball; Swimming; Mass Exercise, Games, Tests; The Sports Program; Labor Engineering; and Military Track*.

While our focus this month is on the *Gymnastics and Tumbling* manual in particular, much of its virtue may lie in the fact that the U.S. Naval Aviator’s physical
training program in total was inspired by war; modeled from successful sport practice, not science; designed and implemented by coaches, not professors; considers sport in the military training sense of physical and mental development and not for the sake of sport or recreation alone; and, finally, was successfully taught to young men of ordinary physical capacity.

The unique and essential contribution of gymnastics to fitness, and by extension to war fighting, is brilliantly articulated in Gymnastics and Tumbling (G&T). At the end of the chapter titled “Brief History of Gymnastics,” we find the powerful statement that “gymnastics and tumbling contribute in large measure to the demands of a democracy at war.”

British author D.W. Brogan said of America’s entry into WWII, “For Americans war is almost all of the time a nuisance, and military skill is a luxury like Mah-jongg. But when the issue is brought home to them, war becomes as important, for the necessary period, as business or sport. And it is harder to decide which is likely to be the more ominous for the Axis – an American decision that this is sport, or that it is business.” That we turned to sport and not science to forge defenders was a wise move at a critical moment. It is also pure CrossFit to let successful practice trump more academic approaches.

The link between the values and physical benefits developed through sport training and the demands of war are demonstrated pointedly throughout G&T. The double edged benefit of mind and body development through fitness and sport are also well noted:

• “It is our duty to train the cadets to be superior to that enemy, mentally and physically. Rigorous, tough, competitive sports offer an excellent medium to fulfill this mission. Records have proven that mental improvement of the cadets goes hand in hand with better physical condition” (v).

• “Basedow…regarded physical activities as a means to a complete education embracing both the body and mind” (4).

• “Pestalozzi…believed that methodical exercising trained the pupil intellectually, morally and aesthetically” (5).

• “Jahn, the father of German gymnastics… wanted to create “liberty loving, social and independent thinking… by strengthening the degenerated muscle groups of...”

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**Sports Program Stunts and Record Performance**

For complete descriptions and diagrams, refer to pages: 322-334 of the book.

**On Floor**

2. Forearm balance – record: 1 min. 47 sec.
3. Hand balance – record: 1 min. 50 sec.
5. Hand walk (low parallels) - record: 6 trips
6. Kneeling back-bend – record: 64
7. Leg lifts and sit-ups – record: 500/500
8. Left side support – record: 130
9. Right side support – record: 130
10 Extension press-up – record: 4 min. 15 sec., no. of times – 25
11. Push-ups on hands – record: 325
12. Push-ups on fingers – record: 84
13. Push-ups slapping chest – record: 75
14. Push-up with 9 lb. medicine ball – record: 305
15. One-arm push-ups – record: 84
17. Sit-ups (feet not anchored) – record: 2326
17 a. Sit-ups – back arched – record: 75
18. Skip forward and backward over leg – record: 21
19. Squat (right leg forward) – record: 47
20. Squat (left leg forward) – record: 41
20 a. Jump over stick – record: 30
21. Wrestler’s bridge – record: 33
22. Eight-foot jump agility test – record: 2.5 sec.
the body, thus liberating man from the shackles of an
environment that made him feeble, that allowed his
muscles, and consequently his mental vigor, to decay” (5).

• “It is of interest to note throughout history, the rise
and fall of nations has seemed to coincide with the rise
and fall of the physical stamina of their people” (7).

• “Athletic professionalism for the few and a lack of
strenuous participation among the many brought
about a decline in the national physical stamina and a
consequent decline in the power of Greece” (7).

Inspired by the demands of a world at war, these
historically conscious authors denounce the then-
current (1944) level of gymnastics instruction in
the U.S. and blame the declining use of gymnastics
apparatus in American public schools and colleges on
the trend toward “mild recreational activities for the
majority while strenuous competition was encouraged
for the small minority.” Ironically this complaint came
at a time when there were 100,000 American members
in one gymnastics organization alone; today there may
be fewer than 1,000 American male gymnasts over ten
years old.

The Navy utilized gymnastics for the discipline's training
effects, not to make competitive gymnasts. This, in the
words of Captain F.T. Ward, the Director of Aviation
Training in 1943, “is the reason that the books are
unlike other sports publications.” This distinction
drives the program's practical approach and explains
why the authors of G&T might have stated the value of
gymnastics to physical development and general physical
preparedness better than most modern authors.

In the introduction to G&T the authors explain
that “Gymnastics and Tumbling is included in the
Naval Aviation Physical Training Program because
of the strength and skills that are developed through
participation in this sport. These include improvement
of upper body strength, and training in quick and correct
decision and action. Since there is no other activity to
develop full upper body strength, agility and balance this
sport occupies a prominent place in the Naval Aviation
Training Program.”

The brief and powerful chapter titled “Values of
Gymnastics and Tumbling” provides a list of further
benefits derived from gymnastic training:

<table>
<thead>
<tr>
<th>Stunt</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Elbow lever on deck</td>
<td>3 min. 46 sec.</td>
</tr>
<tr>
<td>24. Forearm balance walk for distance</td>
<td>43 ft. 9 in.</td>
</tr>
<tr>
<td>25. Hand walk fifty feet for time</td>
<td>8.3 sec.</td>
</tr>
<tr>
<td>27. Head balance to hand-balance</td>
<td>8</td>
</tr>
<tr>
<td>28. Head balance, straight leg lifts</td>
<td>45</td>
</tr>
<tr>
<td>29. Push-ups, crab position</td>
<td>91</td>
</tr>
<tr>
<td>30. Squat balance touch knees</td>
<td>45</td>
</tr>
<tr>
<td>31. Squat jumps</td>
<td>156</td>
</tr>
<tr>
<td>32. Wrestler’s turnover on medicine ball</td>
<td>33</td>
</tr>
<tr>
<td>33. Wrist twist</td>
<td>9 1/2</td>
</tr>
<tr>
<td>34. Diving roll</td>
<td>14 ft. 4 in.</td>
</tr>
<tr>
<td>35. Number of sit-ups in 5 min.; feet unanchored</td>
<td>132</td>
</tr>
<tr>
<td>36. Number of sit-ups in 5 min.; feet anchored</td>
<td>157</td>
</tr>
<tr>
<td>37. “V” position</td>
<td>20 min. 25 sec.</td>
</tr>
<tr>
<td>38. Forearm balance to hand balance</td>
<td>2</td>
</tr>
<tr>
<td>39. V-Roll</td>
<td>32</td>
</tr>
<tr>
<td>40. Burpees</td>
<td>40 in 30 sec.</td>
</tr>
</tbody>
</table>

**On High Bar**

2. Front lever | 19.5 sec. |
3. Belly grinds | 26 |
4. Chins:
   a. Ordinary grasp, no kip | 46 |
   b. Reverse grasp, no kip | 46 |
1. Gymnastics contributes to the development of upper body strength. Over fifty percent of the cadets admitted to the pre-flight schools have been found to be deficient in the upper body strength, especially in the muscles of the shoulder girdle, the triceps, the abdomen, and the back.

2. Gymnastics provides opportunity for the development of power. Rope climbing, throwing the medicine ball for distance, and gymnastic routines require maximum effort and hence develop power.

3. Gymnastics provides for the development of muscular coordination or neuromuscular control. The fundamental activities of running, climbing, and jumping are combined in a unique way in gymnastic routines. Twisting or turning, bending, circling, and swinging movements occur in rapid succession during the routines in the upright or standing position, in the hang, the support, and in various other positions. Perhaps no athletic activity other than gymnastics and tumbling provides the opportunity for the development of maximum muscular coordination and neuromuscular control and perhaps no war activity demands the acme of muscular coordination and neuromuscular control as much as aviation.

4. Gymnastics contributes to the development of suppleness, elasticity, litherness, and flexibility, permitting full range of body movement and control.

5. Gymnastics develops a sense of relocation. A series of fast forward rolls on the mats, or hip circles on the horizontal bar, or a workout on the aerowheel or trampoline, leaves the cadet extremely dizzy at first. Two weeks of practice, however, conditions him effectively so that he makes satisfactory adjustment in a short time. Both the poise and equilibrium are outcomes of the sense of re-location, which affords an awareness on the part of the aviator that he is inverted when he is flying upside down.

6. Gymnastics develops agility – quick, easy, dexterous movements. Vaulting in a variety of positions teaches the fundamental principles of body control. The naval aviator or paratrooper may be called upon to overcome unforeseen hazards and obstacles during landing operations; hence he must be adept in vaulting and in jumping. He must have overlearned the art of vaulting to the side, in a squat position, in a straddle, end-over-end, or in a dive, easily and with minimum effort. Gymnastics, then, dovetails with training on the obstacle course.
since the most effective runner is the one who can skillfully, safely, and quickly adapt his gymnastics vaulting experience to the difficulties of the course.

7. Tumbling teaches falling safely. Practically every phase of his life as a cadet, or aviator, (or as a civilian, for that matter) may be materially aided by a knowledge of tumbling. When he first takes “boot” training, when he takes conditioning hikes when he participates in football, basketball, or any other sports activity, the cadet who can tumble is that much better equipped to save himself from injury caused by falling than one who cannot tumble.

8. The cadet who is temporarily incapacitated by minor injuries may participate in specially selected gymnastics, thus keeping in condition despite his handicap.

9. Gymnastics and tumbling develop body balance which is useful to the individual throughout life. Together with climbing, vaulting and falling, these skills are directly useful in various emergency situations.

10. Gymnastics teaches the cadet how to ascend, descend, and rest on a rope, - skills which are of paramount importance from a practical standpoint.

11. Gymnastics develops a sense of daring and courage, yet discourages foolhardiness.

12. Gymnastics develops attitudes vital to the successful naval aviator: fearlessness, initiative, decisiveness, courage, perseverance, presence of mind, selfconfidence, as well as an analytical outlook and the ability to size up a situation quickly.

The intended audience for Gymnastics and Tumbling, aviator cadets, were more physically ordinary than might be presumed. Pre-Flight School standards included 20 push-ups, 6 pull-ups, and a 16-inch vertical leap. The endurance and agility tests were similarly lax. Most CrossFitters would easily qualify. The G&T curriculum is designed so that “even the inexperienced officer may do a commendable job in gymnastics if he studies and follows the manual and the lesson program thoroughly.”

If the pretest qualifications are too tough, Chapter XII, “Supplementary Programs,” offers “Sub-Squad” programs designed to bring the cadet up to snuff. A program is offered so that “an inferior cadet may be brought up to the standards of the base within a five-week period.” The sub-squad activities listed

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**Sports Program Stunts and Record Performance**

<table>
<thead>
<tr>
<th>Stunt</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Ordinary, weighted with 50 lbs.</td>
<td>15</td>
</tr>
<tr>
<td>d. Swinging dips backward</td>
<td>30</td>
</tr>
<tr>
<td>e. Swinging dips forward</td>
<td>43</td>
</tr>
<tr>
<td>f. Swinging dips forward and backward</td>
<td>31</td>
</tr>
<tr>
<td>2. Grasshopper walk forward and dips</td>
<td>29</td>
</tr>
<tr>
<td>2 a. Grasshopper walk backward and dips</td>
<td>31</td>
</tr>
<tr>
<td>3. Grasshopper jump and dips</td>
<td>29</td>
</tr>
<tr>
<td>4. Grasshopper walk forward and backward dips</td>
<td>22</td>
</tr>
<tr>
<td>5. Lion’s crawl and dips</td>
<td>16</td>
</tr>
<tr>
<td>6. Pirouettes</td>
<td>8</td>
</tr>
</tbody>
</table>

**Low Parallels**

1. Hand balance | record: 2 min. and 16 sec.
2. Hand balance on one bar | record: 60 sec.
3. Push-ups | record: 202
5. Shoulder balance to hand balance | record: 6
6. Push-up (back) | record: 89
7. Tune-table (legs in half lever) | record: 31
8. Elbow lever | record: 3 min. 30.5 sec.
8 a. One-hand elbow lever
9. Pirouettes | record: 9
10. Straight-leg, bent-arm press to hand balance

**Ropes**

1. Rope climb 19 feet | record: 4.9 sec.
2. Double rope climb | record: 7.3 sec.
by apparatus on pages 271-277 provide hundreds of spectacular drills on the horizontal bar, side horse, stall bars, rings, parallel bars, and medicine balls. Remember, these drills are used to ramp you up to 20 push-ups and 6 pull-ups. Most of the exercises here could be done by anyone. How long have we searched for interesting regimens preparatory to basic calisthenics?

In 450 pages, nearly one thousand exercises, and hundreds of photographs there isn’t one exercise of advanced or even intermediate difficulty. The progressions are gentle, sweet, and easy. They were designed for full-grown men of moderate fitness and ability, largely inexperienced and quite possibly terrified, and, as likely as not, disinclined to falling or being upended or inverted. We say the progressions are “gentle” or “universal.”

The aviation cadets’ training attention was split among eleven “conditioning departments” of which gymnastics and tumbling was but one. Gymnastics was “one period” each day. Not every facility had adequate equipment, so a section titled “When Regulation Equipment Cannot Be Secured” describes homemade substitutions for mats, horizontal bars, parallel bars, vaulting box, springboard, and beat boards. The spirit of G&T is one of inclusiveness and “can-do” resourcefulness.

Mining gymnastics for even fractions of the adaptations of the gymnast and not for artistic expression; employing doable progressions; coupling and compromising gymnastic training with other fitness goals and efforts; and emphasizing the mental and character demands of training are all fundamental to the aims of Gymnastics and Tumbling and a near perfect match to the CrossFit charter.

Essential to the CrossFit concept is balanced competency in the ten general physical skills: cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy. Gymnastics has no peer among training modalities for developing the four neurological components of the ten skills—coordination, agility, balance, and accuracy.

In our Santa Cruz, CA, facility, our better athletes play with and practice basic gymnastics movements regularly if not daily. We have parallel bars, rings, mats, and a pommel horse set up at all times. Unfortunately, this aspect of our local athletes’ training hasn’t carried over strongly to our Internet friends following the WOD (Workout of the Day). A lack of equipment and general unfamiliarity with the fundamental exercises of gymnastics within our larger community has resulted in the neurological skills development of the CrossFit community not keeping pace with the other components of fitness.

To remedy this, i.e., to increase our community’s coordination, agility, accuracy, and balance, we commit to the following:

• Familiarizing the CrossFit community with the U.S. Navy’s Gymnastics and Tumbling book (G&T).
• Encouraging those following the WOD to practice and train one of the basic movements from G&T before each workout as part of an extended warm-up.
• Encouraging CrossFitters everywhere to acquire access to parallel bars, rings, mats, etc.
• Posting pictures of athletes’ efforts and successes with the basic movements.

Sports Program Stunts and Record Performance cont’d

3. Rope climb with 27.5-lb. pack – record: 8.2 sec.

Rings
2. Pull-ups both hands leading – record: 9
2 a. Inverted hang – record: 36
2 b. Chins with legs in half-lever – record: 20

Stall Bars
2. Leg lifts – record: 81 times

Medicine Ball
2. Throw for distance - 6-lb. ball – record: 63 ft. 6 in.
• Generally fostering stronger gymnastics awareness, participation, and instruction through the CrossFit website. We want you to use Gymnastics and Tumbling for inspiration, as a checklist for movements learned, as a means to discover new low-challenge bodyweight exercises, and as a contextual reference for greater gymnastics involvement and communication.

There is so much right about G&T. It exists solely to quickly and efficiently extract the gymnastic advantage, was tested and proven with full-grown adults, contains nearly 1,000 exercises, many of which anyone can do (check-out the Squad D and C stunts), and is well illustrated and cleverly diagrammed. The stick figures are wonderful, the avatar records for various stunts are motivating, and the spirit and tone is pure CrossFit—serious yet fun, pragmatic, and challenging.

Sadly, our raving about G&T over the past few months has quickly removed enough copies from the market that the few that remain available have risen nearly 400% in price to over $40. We don’t relish Gymnastics and Tumbling reaching $500, but there will always be more CrossFitters than copies—unless we are able to persuade the US Naval Institute to commission another printing. Until that time, we have resolved to share our copy with everyone.

We scanned our copy of Gymnastics and Tumbling, sacrificing one book for the cause, and we’re making it available chapter by chapter for everyone to download free of charge.

Get to work! Post your frustrations, wounds, and successes to comments.

Table of Contents
(From the book, “Gymnastics and Tumbling”)

<table>
<thead>
<tr>
<th>Cover Pages (7.5 MB)</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAFF (Revised Edition of All Manuals)</td>
<td>iii</td>
</tr>
<tr>
<td>STAFF (Revised and First Editions of Gymnastics and Tumbling Manual)</td>
<td>vi</td>
</tr>
<tr>
<td>PREFACE</td>
<td>ix</td>
</tr>
<tr>
<td>INTRODUCTION (First Edition)</td>
<td>xi</td>
</tr>
<tr>
<td>INTRODUCTION (Revised Edition)</td>
<td>xii</td>
</tr>
</tbody>
</table>

CHAPTER

I Brief History of Gymnastics (4.6 MB) | 3-9
- Earliest History | 3
- Middle Ages | 3
- Modern Times | 4
- Pioneers of Gymnastics in the United States | 8

II Values of Gymnastics and Tumbling (1.6 MB) | 10-12
- Objectives | 10
- Gymnastics Dovetails with Other Departments | 10
- The Purpose of the Program | 11
- Values | 11

III Facilities, Equipment, Maintenance, Substitutes (5.6 MB) | 13-22
- Indoor Facilities and Equipment | 13
- Outdoor Gymnasium | 13
- Outdoor Facilities and Equipment | 17
- Outdoor Gymnasium | 17
- Placement of Equipment in Indoor Gymnasium | 19
- Care of Equipment | 19
- Adequate Provision for Safety | 21
- When Regulation Equipment Cannot Be Secured | 21

IV Principles of Teaching Applicable to Gymnastics and Tumbling (1.7 MB) | 23-26

V Safety Methods and Devices (12.9 MB) | 27-45
- The Art of Spotting or Guarding the Performer | 29
- Hints for Instructor | 29
- Tumbling and Stumbling | 30
- Application of Tumbling and Jumping Activity to Parachute Training | 37

VI Warm Up and Conditioning (2.4 MB) | 46-50
- Warm Up Procedures | 46
- Principles Involved in Lesson Planning | 47
- Elementary Training or Conditioning | 48
- Advanced Training or Conditioning | 49

VII Gymnastic and Tumbling Nomenclature (20 MB) | 51-87
- Gymnastic Apparatus and Their Parts | 51
- Gymnastic Nomenclature or Standard Terminology | 59
- Miscellaneous Gymnastic Terms | 69
- Tumbling and Balancing Nomenclature | 77
- Singles | 77
Gymnastics & Tumbling (continued...)

Doubles and Triples ........................................ 82
Miscellaneous Tumbling Terms .......................... 83
Balancing ....................................................... 85
Competitive Terminology ................................. 87

VIII Gymnastic Apparatus Activities (51.5 MB) ........ 88-167
Horizontal Bar Grasps (In Side Hang) .................. 88
Low Bar ....................................................... 89
High Bar ...................................................... 97
Parallel Bars .................................................. 110
Side Parallels ................................................ 126
Rings ........................................................... 129
Buck ............................................................ 140
Side Horse .................................................... 142
Long Horse .................................................... 155
Elephant ....................................................... 158
Tiger Leaping ................................................ 163

IX Climbing Activities (10.4 MB) ......................... 168-183
Ropes ........................................................... 168
Cargo Net ...................................................... 177
Climbing Net ................................................ 181
Poles ............................................................. 182

X Balancing and Tumbling Activities (31.8 MB) .... 184-238
Balancing ....................................................... 184
Singles .......................................................... 184
Doubles ........................................................ 190
Triples .......................................................... 194
Pyramid Building ............................................. 198
Balance Beam ................................................ 212
Jumps ............................................................ 214
Tumbling ....................................................... 216
Singles .......................................................... 216
Doubles ........................................................ 232
Springboard ................................................... 236

XI Trampoline Activities (21.6 MB) ...................... 239-266
The Fundamentals of Trampoline Activity ............. 241
Progressive Series of Trampoline Stunts ............. 244
Additional Trampoline Stunts ............................ 250
Comprehensive List of Trampoline Stunts with
Difficulty Rating ............................................. 260

XII Supplementary Programs (10.8 MB) ................. 267-291
Sub-Squad ..................................................... 267
Administrative Forms ..................................... 267
Sub-Squad Activities ..................................... 271
Injured Cadets .............................................. 277
Administrative Forms ..................................... 277
Activities for Cadets with Leg Injuries ............... 279
Activities for Cadets with Arm and Chest Injuries . 281
Free Exercises ............................................... 282
Climbing Poles .............................................. 283
Horizontal Ladder .......................................... 283
Pulley Weights .............................................. 284
Greg Glassman is the founder (with Lauren Glassman) of CrossFit, Inc. and CrossFit Santa Cruz and is the publisher of the CrossFit Journal.