The Second European Sprints & Hurdles Conference
University of Warwick, England
10-11 November 2012
A HISTORY OF SPRINT TRAINING METHODS

Pierre-Jean Vazel (ES Montgeron) 2012

The Second European Sprints & Hurdles Conference
ETYMOLOGY

PROTO-INDO-EUROPEAN

*sperdhō
= compete (in sports)

*sperghō
= hurry

~ rapid mvt
= vigor, joy,

shoot, eject, throw,
push, stretch, jump,
to long for, be eager,
start, first, before, best...

PROTO-GERMANIC

*spurdz
= stadium, racetrack

WEST GERMANIC

spurt

springan

OLD HIGH GERMAN

sprinzan
= to jump up

spurt

= stadium

= racecourse

= a measure of distance

OLD ENGLISH

Spyrd

= to leap, fly up

Springan

= to spring up

MIDDLE ENGLISH

Sprenten

= wonderful, ejected, brisk, active,
not easily bent, becoming strong,
to germinate, to chase girls, etc...

ENGLISH

Sprint (1387)
ETYMOLOGY

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= to spring up

ENGLISH

sprint (1387)

FULL TRAINING (PRO)GRAMME!
## ETYMOLOGY

<table>
<thead>
<tr>
<th>Year</th>
<th>Quote</th>
<th>Author</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 1387 | « And when they holy watir on him caste,  
Yet spake the child, when sprint was holy water,  
And songe, O alma redemptoris mater! »  
► Geoffrey CHAUSER, The Prioress’s Tale, *The Canterbury Tales* | | |
| 1740 | « See this sweet simpering Babe, / Dear image of thyself; see how it sprunts »  
► William SOMERVILE, *Canto III* : Poem about a sack race (rural game) of Homerian inspiration | | |
| 1854 | **SPRINT** “lively” (from sprunt and sprant, hurry) used in vulgar tongue of Northamptonshire  
► Anne Elizabeth BAKER *Glossary of Northamptonshire, Words and Phrases* | | |
| 1860 | « he does some ‘sprint’ running at the top of his speed – a 100 yards, say, 6 or 7 times »  
► Williams W. HALL How the Benicia Boy was trained,  
| 1868 | A “spirt” runners who trains for “spirting”  
► C.A. WHEELER, *Sportascrapiana* | | |
| 1880 | The noun and verb takes sprint takes over and his spread in Europe via the multiplication of sports books and training manuals directly inspired from English editions.  
Sprinters ≠ pedestrians, foot-runners… | | |
Koroibos of Elis, first winner of the Ancient Olympics, debut of Ancient Greece chronology

TIMAEUS (historian, ~345 - ~250 BC), *The victors at Olympia*
GENERAL CONSIDERATIONS ON SPRINTING

1490 « The faster a man runs, the more he leans forward towards the point he runs to and throws more weight in front of his axis than behind. A man who runs down hill throws the axis onto his heels, and one who runs up hill throws it into the points of his feet; and a man running on level ground throws it first on his heels and then on the points of his feet. »
Leonardo da VINCI, Paris Manuscript A

1757 First known timing: 100y match between 2 tradermen won in 11 sec
► The London Chronicle (GBR), 5-8 March 1757

1863 Train in very hot weather / AM hard PM easy / Rubbing after training / practice against a watch
► Charles WESTHALL (GBR) The Modern method of training for running

1887 « Another curious thing about sprinting is the varieties of action in which good performers indulge » « a man’s natural action » « (with practice) his style involuntarily begins to approximate in a greater or less degree to the best model » « the high jumper like the sprinter is born not made, for though muscles can be hardened and strengthened by practice, nothing but nature can make them elastic»
► M. SHEARMAN (GBR, 100y and co-founder of AAA), Athletics and Football

1897 « The sprinter, the man of speed, is born; the runner, the man of endurance, can be made. »
► John ROBERTSON (USA), The University Magazine, Volume 8
<table>
<thead>
<tr>
<th>Year</th>
<th>Citation</th>
<th>Quote</th>
<th>Author/Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>1863</td>
<td>Charles Westhall (GBR, pedestrian) - <em>The Modern method of training for running</em></td>
<td>« The same amount of work and strict regimen is not requisite for the sharp burst of a 100y that it is imperative (for a mile), but as stated before the theory of the practice is the same »</td>
<td></td>
</tr>
<tr>
<td>1881</td>
<td>William HARDING (USA), pedestrian – <em>The American Athlete</em></td>
<td>« The (sprint) distance may be run out oftener, but all trials should be left to the judgment of the trainer who has by far the best perception as to weakness and jading from overwork »</td>
<td></td>
</tr>
<tr>
<td>1908</td>
<td>Reginald WALKER (RSA, 100m Olympic Ch) <em>Textbook of Sprinting</em></td>
<td>« Training, faithfully and rationally performed, stores up a reserve of nerve force that is completely under control. That distinguishes the well-trained man from one overtrained. »</td>
<td></td>
</tr>
<tr>
<td>1929</td>
<td>Archie HAHN (USA, Olympic Champ 60-100-200m 1904-6 and coach) <em>How to Sprint</em></td>
<td>« A 6-day training week was formerly considered to be the best training method and is a throwback from the oldtime professional system. Of recent years there has been a decided tendency toward underwork and, during the competitive season a 2 or 4 day week is sufficient when finished up by hard Saturday competition. »</td>
<td></td>
</tr>
</tbody>
</table>
System of Training by George SEWARD (USA)

6:00 am Rise. Sponge the body and rub dry. **EXERCISE** a brisk walk of from 3 to 5 miles according to the weather; wash, rub dry, and good hand friction

8:00 am Breakfast: Oatmeal, mutton chop, broiled chicken, bread one day old, toast, tea

10:30 am **EXERCISE** starting on a slow walk, increase the pace to a sharp run; go a good distance if the condition and weather will permit, always ending with a half mile at moderate walk

1:00 pm Dinner: about the same as at breakfast, with the addition of some fresh vegetables, but sparingly

3:30 pm **EXERCISE** walking and running moderately, with a light dum-bell in each hand; occasionally drop the bells, and spurt a 100 yards or so

7:00 pm Supper: 2 fresh eggs, fresh berries or stewed gooseberries; with bread, toast, tea

10:00 pm Bed
“I used to train once a week, for the Olympic year I did two. There was no track, no indoor, our training consisted in endurance and sprints on the grass field. When it was raining we would stretch in the child’s classroom.”

Personal interview (2012)

“After a week, Ed TEMPLE cut me down to 2 practices a day and after 2 weeks, he trimmed it to 1 practice a day. He knew his runners like a book, and he didn’t want me burning myself out before we got to Rome.”

Wilma Rudolph, Wilma (1977)
Delano MERIWETHER (USA)
1971 100y National Champion
Training 3 hours a week
### ENDURANCE

<table>
<thead>
<tr>
<th>Year</th>
<th>Citation</th>
</tr>
</thead>
</table>
| 1859 | « It is necessary to avoid too much running work in short matches. Walking must be made the means of improving the general health and running only adopted for about the length which is to be run. Beyond this, long-continued running makes a man slow. »  
  John Henry Walsh ‘Stonehenge’ (GBR, former surgeon) *British Rural Sports* |
| 1901 | « In preparing for a Race, we must practise the Start indefatigably, so as to get up the utmost speed from the very beginning. But it is also necessary to strengthen the Heart and Lungs as much as possible and bring them to their highest pitch of power. Although this can be partly done by the frequent practice of short Runs, yet the prolonged Long-Distance Run produces far more permanent effect here, demanding, as it does, a continuous uniform exertion of the Muscles of Breathing and the Muscles of the Heart »  
  Ferdinand A. Schmidt (GBR) *The Training of the body* |
| 1905 | « There is nothing, undoubtedly, that would be of more advantage to a person about to take up athletics preliminary to his regular work than cross-country jaunts »  
  Arthur DUFFEY (USA, 100y WR 9.3/5) *How to sprint (The Amount of work to do daily)* |
| 1913 | « The sprinter in training must be careful to avoid other pastimes or exercises than those which are needed for quickness and the using of all the body muscles »  
  Sam MUSSABINI (GBR, coach) *The complete trainer* |
| 1939 | « Excessive jogging is harmful to the sprinting muscles »  
  Dean CROMWELL (USA, coach to 4 100y WR holders 1914-1948) *The Sprint races* |
Bob HAYES (USA) 182cm 85kg
1964 100m Olympic Champion 10.06
« The most important thing that Pete GRIFFIN taught me was conditioning. He used to take us out in the country and make us run 10 miles »
► R. PACK Run, Bullet, Run 1992

Hasely CRAWFORD (TRI) 188cm 88kg
1976 100m Olympic Champion 10.06
« poor rating for cardiovascular fitness »
Treadmill walking test performed in April 1977
Heat Rate 187 after 16½ min
► Kenneth COOPER (USA, Cooper Test designer)
Aerobics program for total well-being 1985
Weekly volume for yearly Top10 ranked 100m male sprinters based on training samples (~15 sprinters/decade)

April 1967 - Roger BAMBUCK (100m WR 10.0 in 68) French training camp « Opération Lacanau Océan »
### SPEED ENDURANCE

<table>
<thead>
<tr>
<th>Year</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 1859 | « The trainer will, in preparing his man for short matches, make him run daily 2 or 3 times over the distance intended; and either run against with with a start of a few yards in advance, which gives confidence, or time him exactly, keeping the result to himself. »
  
  ► John Henry Walsh ‘Stonehenge’ (GBR, former surgeon) *British Rural Sports*

| 1887 | Rarely more than 2/3 of the distance for which a sprinter is training even for 300y.
  
  ► Montague SHEARMAN (GBR, 100y and co-founder of AAA), *Athletics and Football*

| 1894 | « Mr MURPHY, the trainer at the Detroit Athletic Club and at Yale U, who has turned out more first-class sprinters than any other trainer in the world, makes endurance work a regular part of his exercise for sprinters. Several of his hundred yars men, who have not had natural bottom enough to do well at the long dash, have been trained into excellent endurance. »
  
  ► *Outing, March 1894*

| 1913 | « Average schedule of long sprint times »
  
  ► Sam MUSSABINI (GBR, coach) *The complete trainer* ▼

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<table>
<thead>
<tr>
<th>Distance</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 yds.</td>
<td>11 secs.</td>
</tr>
<tr>
<td>150 yds.</td>
<td>16 1/2 secs.</td>
</tr>
<tr>
<td>200 yds.</td>
<td>22 2/5 secs.</td>
</tr>
<tr>
<td>220 yds.</td>
<td>24 4/5 secs.</td>
</tr>
<tr>
<td>300 yds.</td>
<td>34 1/2 secs.</td>
</tr>
</tbody>
</table>

*The average good runners.*

<table>
<thead>
<tr>
<th>Distance</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 1/2 seconds sprinter</td>
<td>10 1/2 secs.</td>
</tr>
<tr>
<td>10 1/2 seconds sprinter</td>
<td>14 4/5 secs.</td>
</tr>
<tr>
<td>10 1/2 seconds sprinter</td>
<td>20 secs.</td>
</tr>
<tr>
<td>10 1/2 seconds sprinter</td>
<td>22 1/2 secs.</td>
</tr>
<tr>
<td>10 1/2 seconds sprinter</td>
<td>31 1/2 secs.</td>
</tr>
</tbody>
</table>
Weekly volume for yearly Top10 ranked 100m male sprinters based on training samples (~15 sprinters/decade)

A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

**SPEED TRAINING**

1887 ~12 x 30 yards. Rest few minutes. 1 x 70 yards at any rate. Rub down.
► Montague SHEARMAN (GBR, 100y and co-founder of AAA), *Athletics and Football*

1910 Speed work 150y with accel and slow portions « The sprinter must be taught to get his feet off the ground quickly and run on the ball of his foot all the time with toes pointed straight ahead »
► J. GRAHAM & E. CLARK (USA) *Practical T&F Athletics, Sprinting*

1913 ► « Schedule of average times made by various classes of sprint-runners at 120 yards »
Sam MUSSABINI (GBR, coach) *The Complete Trainer «

1939 Wind-sprinting : « walking, jogging, making a short sprint and repeating the operation »
► Dean CROMWELL (USA, coach) *The Sprint Races*

1948 10 x 30 meters from flying start (workout for Vladimir KOROYEV 100m URS Record 10.6)
► Leonid CHOMENKOV (URS) *The Short Distance Race (1956)«
Weekly volume for yearly Top10 ranked 100m male sprinters based on training samples (~15 sprinters/decade)

RUNNING DISTRIBUTION AT TRAINING

TENDENCIES

- Quality ➤ quantity of quality ➤ quality of quantity
- Less Endurance through the season
- More intensity for Speed Endurance
- Speed Endurance performed later in the season
- Speed performed earlier in the season
- Less number of reps for starting blocks out of CP
- Less differences between training plans
## COMPETITIONS OF 100M OLYMPIC CHAMPIONS

<table>
<thead>
<tr>
<th>Year</th>
<th>Athlete</th>
<th>TOTAL</th>
<th>Indoor</th>
<th>100</th>
<th>200</th>
<th>+300</th>
<th>H/J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>Harold ABRAHAMS (GBR)</td>
<td>11</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1928</td>
<td>Percy WILLIAMS (CAN)</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1936</td>
<td>Jesse OWENS (USA)</td>
<td>16</td>
<td>14</td>
<td>9</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1948</td>
<td>Harrison DILLARD (USA)</td>
<td>26</td>
<td>15</td>
<td>2</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>Hasely CRAWFORD (TRI)</td>
<td>20</td>
<td>6</td>
<td>13</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>Linford CHRISTIE (GBR)</td>
<td>29</td>
<td>2</td>
<td>23</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>Donovan BAILEY (CAN)</td>
<td>29</td>
<td>8</td>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Maurice GREENE (USA)</td>
<td>14</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>Justin GATLIN (USA)</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Usain BOLT (JAM)</td>
<td>14</td>
<td>9</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>Usain BOLT (JAM)</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

START

- 500 Balbis (-424) & Hysplex (-411)

1840 s Crouch & low starts used in Pro matches as an handicap

1890 s Crouch start found to be an efficient technique ►

1927 Patent application for « foot support » or « starting block » by George BRESNAHAN (USA, University of Iowa HC) - 0,034s advantage?

1929 Controversies on starting blocks, Glendale News Press, June 1929

1937 IAAF officially allows the use of starting-blocks

1972 The False Start Detection Apparatus by Junghans (FRG) in use at OG

1980 Starting blocks mandatory for Moscow OG and from that time onward

1991 Setting of <0.100s is specified in the IAAF Rules
1978 - Allan WELLS (GBR, 100m Olympic Champion 1980)
ITN report (1978) - If he did use blocks, his front foot would be 9 inches further away from the start line
« There’s no difference between the starting-blocks and the way i start »

1974 - Valeriy BORZOV (URS, 100m Olympic Champ 1972)
Personal interview (2012) - « I tested all the starting positions at training and competitions and the best i came up with is the usual four-stance from starting-blocks »

▲ 1978 - Allan WELLS (GBR, 100m Olympic Champion 1980)
ITN report (1978) - If he did use blocks, his front foot would be 9 inches further away from the start line
« There’s no difference between the starting-blocks and the way i start »

[ PBs 10.15 without blocks & 10.11 with ]
### Resisted Sprinting

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
<th>Authors/References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>Physiological adaptation to Up Hill running analysed from a medical point of view</td>
<td>Ferdinand A. Schmidt (GBR) <em>The Training of the body</em></td>
</tr>
<tr>
<td>1927</td>
<td>« The Theory of Running Up Hill »</td>
<td>K. Furusawa &amp; A. Hill (GBR) <em>The Dynamics of Sprint Running</em></td>
</tr>
<tr>
<td>1949</td>
<td>Sprinting with weight belt – 4x40m flying start</td>
<td>Leonid Chomenkov (URS), <em>The Short Distance Race</em> (1956)</td>
</tr>
<tr>
<td>1962</td>
<td>Uphill study « Improving speed by training on sloping surfaces »</td>
<td>Milan Milakov (YUG) <em>Track Technique 8</em></td>
</tr>
<tr>
<td>1965</td>
<td>▲ « Special strength exercises » Leonid Bartenev (URS, NR 10.2 in 1960)</td>
<td><em>Legkaya Atletika</em></td>
</tr>
<tr>
<td>1969</td>
<td>Pulling a 7kg steel platform attached to the waist by a webb belt)</td>
<td>Lajos Mihalovics (USA) <em>The Effects of Artificial Drag and Load on the Performance of the 220 Yard Run</em> (Thesis)</td>
</tr>
<tr>
<td>1969</td>
<td>Pulling 6 to 8% of body weight</td>
<td>Richard Gibson (USA) <em>Relative Effects of 2 Training Programs on Sprinting Speed</em> (Thesis)</td>
</tr>
</tbody>
</table>
Gentleman’s Magazine

For August, 1786.

At Brighton, an uncommon race was run for two guineas a side, which afforded excellent sport for the diversion of the company. A military gentleman, with a jockey on his back, weighing seven stone five pounds, booted and spurred, ran against a fat bullock unmounted, across the Steine, and won with great ease. The bets before starting were ten to one against the winner.

Illustration from Montague SHEARMAN
Athletics and Football 1887
Bud WINTER (USA) practice with Tommie SMITH & Lee EVANS
Visit in San Jose by Czech team, picture published in « Atletika » 1967

Valeriy BORZOV (URS) practice in Kiev « Secrets of Speed » 1972

Usain BOLT and Glen MILLS (JAM) practice in Kingston
# ASSISTED SPRINTING

<table>
<thead>
<tr>
<th>Year</th>
<th>Method</th>
<th>Description</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>Towing using a moto</td>
<td>3x50m flying start tow (r5’), 2x50m normal (r6’) = 0.3 improvement</td>
<td>Nikolay PONOMARYEV (URS, 10.7) &amp; coach Anatoly FRUKTOV cited in N. OZOLIN (1971)</td>
</tr>
<tr>
<td>1949</td>
<td>Downhill</td>
<td>Short flying sprints (30-60m) on sloping cinder or grass track to increase speed</td>
<td>Leonid CHOMENKOV (URS), <em>The Short Distance Race</em> (1956)</td>
</tr>
<tr>
<td>1956</td>
<td>Towing using a car</td>
<td>Training getting sprinters to hold onto an extension of the rear bumper bar</td>
<td>Cecil ‘Chic’ HENSLEY (AUS)</td>
</tr>
<tr>
<td>1968</td>
<td>Pulling device for sprint training</td>
<td></td>
<td>Tengiz BAKRADZE (URS) Legkaya Atletika</td>
</tr>
<tr>
<td>1969</td>
<td>Contrast</td>
<td>The speed of performing an exercise is superior if prior to it, for a short period of time, the athlete does weight training</td>
<td>C. FLORESCU &amp; al (ROM) <em>Methodology of developing physical qualities</em> cited in T. BOMPA</td>
</tr>
<tr>
<td>1971</td>
<td>Treadmill</td>
<td>The effects of a high speed treadmill training upon sprinting speed</td>
<td>George DINTIMAN (USA)</td>
</tr>
</tbody>
</table>

Wind? Altitude?
A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

Towing using an automobile and a tow line (1976?)

Linford CHRISTIE (GBR) using overspeed device with M.LEWIS-FRANCIS

Charlie FRANCIS (CAN) « Running into trouble » 2002

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**High Speed Treadmill**

*Key issues:*
- An athlete does not maintain a constant speed in reality, as he/she is either accelerating or decelerating, however slightly.
- An athlete accelerates by sweeping his foot down and back at a rate faster than the ground is moving backwards under him or her.
- By definition, acceleration cannot occur in this environment unless the athlete actually runs off the front of the treadmill.

**Towing**

*Key issues:*
- Towing devices pull the athlete into the ground prematurely, increasing ground contact time - precisely the opposite of the objective, which is to decrease ground contact time.
- The foot strikes too far in front of the body's center of gravity, increasing braking forces and the risk of injury.

**Downhill Sprinting**

*Key issues:*
- Steep grades accelerate the athlete into the ground.
- As with towing, the foot strikes too far in front of the body's center of gravity, increasing braking forces and the risk of injury.
- Any slips or falls during a downhill run could result in serious injury.
MODIFIED RUNNING

1887

Skipping (as an exaggerated action) of the sprint runner: « to stretch all the muscles and increase the freedom of motion in the joints, and thus assist materially in the development and freedom of the action »
► Viscount Bury & G. Lacy HILLIER (GBR) Cycling

1908

Training by dancing « It consists in the athlete’s dancing up and down on the toes in such a manner as to bring into play the same muscles that are used in running. To learn the exercise the athlete should alternate in raising each leg so that the knee will come to about the same level as the hips. I have used this with my track athletes during the winter months when it was impossible to run out-of-doors. I also used it continually during both trips of the American Olympic teams to Europe in 1908 and 1912. »
► Michael MURPHY (USA) Athletics Training (1914)

Picture taken on board en route to 1912 OG - Frank BELOIT (center) 5th at 100m
HERE THEN ARE THE ESSENTIALS OF GOOD SPRINT FORM.

A GOOD SPRIENTER WILL

1. Have high knee action.
2. Have good foreleg reach.
3. Run high on toes.
4. Have good arm action.
5. Bound forward, not up.
6. Maintain good forward lean.
7. Run tall, with back straight.
8. Be relaxed (loose jaw -- loose hands).

These are not natural movements, so you must practice these exercises.

Exercise No. 1
HIGH KNEES

(a) Run in place.
(b) Lifting knees high, move down straightaway at 2 m.p.h., walk the turn, repeat 2 or 3 laps.

Exercise No. 2
REACH EXERCISE

Practice exaggerating reach of foreleg as you go down field on grass several times.

Exercise A — high knee running exercise employs exactly the same technique as the marching exercise. The head is erect and there is no rotation of the shoulders. The arm action is forward and backward — the faster the action, the smaller the angle. The high knee action with the complete rear extension is done on the toes. The centre of gravity is at the highest point possible. The shorter the steps, the more intense the work. This, in itself, is a very difficult exercise and needs preparation in order to do it well. The technique must never be sacrificed for greater speed.

Exercise B — the high running exercise with leg extension is like exercise A in that it is very intense and needs appropriate preparation.

With improvement, a more "active down" leg action can be emphasized. Further technical exercises are: from the high knee marching form, gradually change to acceleration in the running form; from the bounding exercises, gradually accelerate to the running form; from exercise A gradually change to the running form. Try accelerations from the standing start. Do speed work from starting blocks.

Bud WINTER (USA) So You Want To Be A Sprinter 1956

Gerard MACH (POL / CAN) Sprint & Hurdles 1980
BOUNDINGS

1905  Bounding exercise « A bound should be cultivated so that the runner will remain upon the ground for as short a space of time as possible. »

► Arthur DUFFEY (USA, 100y WR 9.3/5) How to sprint ►

1910  « Springing up and down the track to develop springiness »

► GRAHAM & CLARK (USA) Practical T&F Athletics

1956  Systematic use of VJ, SLJ & STJ as control tests

1960  ► Y. CHATSKOV & G. TUROVA (URS coaches, 1963 & 64)

1974  Scientific research Jumps in the training of the sprinter

Y. VERKHOSHASNKY, G. ChERNOUSOV (URS) ▼
A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

Armin HARY (GER)   Valeriy BORZOV (URS) Evelyn ASHFORD (USA)

Irina PRIVALOVA (RUS) European Record 10.77 – Single leg hops from blocks
THROWING

1868
Training for ‘spirting’ according to one of the « fastest runner of the day » (a ‘spir’ runner) « In the afternoon throwing stones to keep the muscles in action »
► C.A. WHEELER (GBR), Sportascrapiana

1960
Systematic use of Shot Put as control tests
► Andrzej PIOTROWSKI (POL), Irena KIRSZENSTEIN 1964 training

Armin HARY (GER) 10.25 & 100m Olympic Champion 1960

Squat position — push the ball with forward fall — take the starting position — start

► Gerard MACH (POL, Head Coach Canadian TFA) Sprint & Hurdles (1980)
### WEIGHT LIFTING

<table>
<thead>
<tr>
<th>Year</th>
<th>Quote</th>
<th>Author/Coach</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1894</td>
<td>« To a great extent the growth of muscular power is subject to the special agency of the nervous system and the care and nourishment of it is often entirely overlooked »</td>
<td>Michael MURPHY (USA, coach)</td>
<td><em>College Athletics</em></td>
</tr>
<tr>
<td>1905</td>
<td>« The preliminary work of sprinting (first few days) should be spent mostly in rather light exercise in the gymnasium with the chest-weights and in the exercises of pulling up the body »</td>
<td>Arthur DUFFEY (USA, 100y WR 9.3/5)</td>
<td><em>How to sprint</em></td>
</tr>
<tr>
<td>1908</td>
<td>Punch-ball or dum-bells to make arms &amp; shoulders as strong as hips &amp; thighs</td>
<td>Reginald WALKER (RSA, 100m Olympic Champion)</td>
<td><em>Textbook of Sprinting</em></td>
</tr>
<tr>
<td>1952</td>
<td>I have found that by training with weights I have minimized the risk of pulled muscles by strengthening them and at the same time maintaining the desired flexibility so essential to sprinting.</td>
<td>Emmanuel McDONALD BAILEY (TRI, 100m WR 10.2)</td>
<td></td>
</tr>
<tr>
<td>1962</td>
<td>« Watch on your weight lifting that you’re not seeing how much you can lift, but build strength through light stuff with repetitions »</td>
<td>Advice from Bill BOWERMANN to Harry JEROME (CAN, 100m WR 10.0)</td>
<td></td>
</tr>
</tbody>
</table>
A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

- I never lifted weights when I was running. Weight training was unheard of for sprinters in those days. My training regimen consisted of running and doing isometric exercises. I can only imagine what a top-notch strength coach, like Bob Ward of the Cowboys, could have done for me.

The most common strength work-out is weight training. Although Allan used this type of training when he was long-jumping, he has never used weights since changing his event to sprinting. The main reason was that he found a more than adequate substitute in the speedball. However, 90 per cent of all athletes use weights, so they must have a purpose. If we were to use weights for sprinting then we would use light weights doing fast repetitions. This is all I am going to say on this subject as I do not feel qualified to expand on weight training when weights are not used as part of our programme and when there are so many experts in this field.

Если в начале подготовительного периода я работал с большими (более 100 кг) отягощениями до утомления, то весной я переходил к упражнениям с меньшим весом, выполняя их серии и на время (например, заданное число приседаний за 10 сек. с определенным весом). Таким образом, мы шли от общей работы к специальной. Интересно, что, не работая с максимальным весом, мне удавалось показывать довольно высокие результаты в отдельных упражнениях: например, встать из приседа со штангой на плечах весом 180 кг.
## TERMINOLOGY

<table>
<thead>
<tr>
<th>USUAL TERM</th>
<th>PROPOSED TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraction</td>
<td>Action, Activation (Cavanagh 1988)</td>
</tr>
<tr>
<td>Concentric (Karpovich 1959)</td>
<td>Miometric (Hubbard 1938)</td>
</tr>
<tr>
<td>Eccentric (Karpovich 1959)</td>
<td>Pliometric (Hubbard 1938)</td>
</tr>
<tr>
<td>Isometric (Fick 1887)</td>
<td>Isometric</td>
</tr>
<tr>
<td>Plyometrics training (Zatsiorsky 1966)</td>
<td>Reactive, Shock Method Powermetrics (Verkhoshansky/Siff)</td>
</tr>
</tbody>
</table>
STRENGTH TRAINING FOR WOMEN

Lyudmila KONDRATYEVA, 100m Olympic Champion 1980
« [The up-to-date athletic girl] is essentially feminine. She does not as a rule want to vote, and the desire to command or govern, except in her own proper province, is furtherest from her thoughts » The Police Gazette, USA (1895)

« [Down South] there was a lot of talk about ‘playing sports will give you muscles, and you’ll look just like a man’. They would say, ‘If you run around too much as a girl you’ll never be able to have children.’ The running was supposed to be too much strain for your body… » Wilma, Wilma Rudolph (1977) – about her 7th grade year + limited facilities access!

« Vince Reel, Chi Cheng’s coach, feels like the erstwhile image of the track girl as a weight-lifting wallflower has completely faded. ‘I think women’s track in the United States got off to a bad start when they brought Tamara Press and her sister over here. Most of the girls are now finding out that you have to have a good build to compete in this sport. Well, I think it’s becoming a fad, actually.’ » Transcript from CBS doc (1970)

Fanny BLANKERS-KOEN, « The Flying Housewife »
A favorite exercise for women in the early Nineteenth Century was the use of the Giant Step or Flying Course. This illustration, from an anonymous 1830 French text is remarkable for the vigor displayed by the girls. They are clearly running, holding themselves up by strength of their arms.

**GIANT STEP** Invented in Italy, developed and introduced in France in 1806 by Fransisco AMORÓS (ESP)
1800  Calisthenics
1900  Perf development
1920  All-round athletes
1950  Quantitative approach
1968  Specific training

Irena SZEWISNKA (POL)
Calisthenics, Callisthenics, kal-is-the-n'ika, n. exercises for the purpose of promoting gracefulness as well as strength of body. 1802

Physiology and Calisthenics.

For Schools and Families.

By Catharine E. Beecher.


1856
Calisthenics, callisthenics, kal-is-then’ika, n. exercises for the purpose of promoting mental and physical exercise.

CALLISTHENICS.

The regular and somewhat scientific gymnastics, formerly introduced into schools, under the title of Calisthenic exercises, have, we believe, had their day, and gone into general disuse. Possibly the novelty of this method was its chief recommendation, though it is said that some were injured by it, either from the unnatural positions into which the limbs were thrown, or by the violence of the motions.

The great objection to this mode of exercise, however, we conceive arises, not from these causes, for the positions, as well as the violence of the motions could easily be regulated according to the condition, or strength of the pupil, which certainly ought to be the case in every exercise. The objection is founded on other grounds, and the reason why this method does not prevail, is, that it does not answer the purposes intended; nor will any other exercise, which has no motive connected with it, and therefore does not interest the feelings, and excite the brain.

Mere positions, or mere muscular contractions, as we have shown, are of very little use, especially when the
A HISTORY OF SPRINT TRAINING METHODS – PJ VAZEL 2012

Comparative Physiology,
Outlines of Physiological
Philosophy,
Comparative and Human,
Mechanical, Animal, Vital, and Sensory Organs,

The regular and somewhat scientific gymnastics, formerly introduced into schools under the title of Callisthenics, have, we believe, had their day, and possibly the novelty is said to have, in the unnatural position of the body, by the unwieldy apparatus, driven us from the latter. The exercise of the brain, however, shows an increase of efficacy and a more certain result in the gradual improvement of the individual, by the steadiness and consistency of the mental and physical exercises.
PERFORMANCE DEVELOPMENT

Mary MORGAN, 100y World Best 12.0 (1913)
PERFORMANCE DEVELOPMENT

Mary MORGAN, 100y World Record 12.0 (1913)

From the physical standpoint, any exercise under favorable circumstances is beneficial in that it develops and brings into play the muscles of the body and stimulates the whole system. But all forms of athletics should be carefully supervised.
Workout abroad ship meant sprinting around the deck a time or two plus calisthenic exercises designed to strengthen leg muscles. Track coaches of men and women alike did not proscribe weight lifting or other body-building routines that are now thought to be essential for training runners. »

The Fulton Flash (2004), from H.S. diary

Helen STEPHENS sailing to Berlin 1936

« Workout abroad ship meant sprinting around the deck a time or two plus calisthenic exercises designed to strengthen leg muscles. Track coaches of men and women alike did not proscribe weight lifting or other body-building routines that are now thought to be essential for training runners. »

The Fulton Flash (2004), from H.S. diary
100m WR holders and all-round athletes: natural strength training?

- Kinue HITOMI 12.15 (1928)
- Helen STEPHENS 11.6 (1935)
- Stella WALSH 11.6 (1937)
- Fanny BLANKERS 11.5 (1948)
- Chi Cheng 11.0 (1970)
AUSTRALIA - Shirley STRICKLAND (Olympic medalist 1948-1956) believed that strength was a fundamental requirement for sprinting and that isometric training appeared to be a promising method of rapidly developing strength.

Marjorie JACKSON (100 & 200m Olympic Champion) working out for strength with Emmanuel MCDONALD BAILEY (c. 1952)

1962 - Protocol based on the pioneer work (1954) of PhD Harrison CLARKE (University of Oregon, USA). An objective isometric programme involving a high (80% maximum) loading factor was used by Australian sprinters incl. Margaret BURVILL and part of Betty CUTHBERT’s routine.
Qualitative evolution of strength training for Raelene BOYLE

1960’s

Age 11-13
School holidays during 6 weeks
- Style work : be skilled how to cover the ground
- Gym work : variety of strength & flexibility exercises (daily)
I realised my power to weight strength was above average

Age 17
Before Mexico’68, 45min training 3x/week over 3 months
No-one could really believe that someone had made the Olympic team with next to no training

1970’s

Age 20-22
I had the ability to train fast rather than hard, practice with shorter
bursts of high quality work rather than masses of slogging track work

Age 24-25
After illness & injury I used intense gym work to recover and build
me physically to be able to cope with the level of track work that was
needed to stay at the top. Once again my power to weight ratio was very high
Training regime a combination of track session, weight work, running in
water, treadmill exercises or running up and down hills. Some sessions 6h+

1980’s

Age 30+
Once a week gym work was included in my work programmed as too
much gym work bound me upon

100m 11.20A (1968), 200m 22.45 (1972), 400m 51.08 (1982), Flying 100m 10.16 (WB 1972)
Winter 1965/6 - Irena SZEWISNKA (POL) - WRs 100m 11.1 200m 22.7 - training in Bielany (Warsaw)
## Strength training volume for Soviet sprinters pre-1963

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>100M</th>
<th>Jumps (n)</th>
<th>Weights (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vera KREPKINA</td>
<td>1958</td>
<td>11.3</td>
<td>722</td>
<td>41</td>
</tr>
<tr>
<td>Galina POPOVA</td>
<td>1959</td>
<td>11.4</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>Maria ITKINA</td>
<td>1960</td>
<td>11.4</td>
<td>1472</td>
<td>199</td>
</tr>
<tr>
<td>Lyudmila MOTINA</td>
<td>1960</td>
<td>11.7</td>
<td>423</td>
<td>0</td>
</tr>
<tr>
<td>Renate LACE</td>
<td>1960</td>
<td>11.8</td>
<td>828</td>
<td>304</td>
</tr>
<tr>
<td>Vera KABRENYUK</td>
<td>1962</td>
<td>11.8</td>
<td>2700</td>
<td>12</td>
</tr>
</tbody>
</table>

Turova (1963)
Yearly weightlifting volume for URS/RUS 100m record holders of different era

1958
Vera KREPINKINA
11.3

1980
Lyudmila KONDRATYeva
10.87*

1994
Irina PRIVALOVA
10.77

### Strength level obtained for 100m performance by Soviet female sprinters

Statistics from 217 female sprinters, Bartenev (1974)

<table>
<thead>
<tr>
<th>100m (s)</th>
<th>14.0</th>
<th>13.0</th>
<th>12.0</th>
<th>11.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Long Jump</td>
<td>2.09</td>
<td>2.20</td>
<td>2.31</td>
<td>2.41</td>
</tr>
<tr>
<td>Dorsiflexor</td>
<td>2.18</td>
<td>2.25</td>
<td>2.33</td>
<td>2.40</td>
</tr>
<tr>
<td>Quadriceps fl+ex</td>
<td>5.12</td>
<td>5.30</td>
<td>5.49</td>
<td>5.68</td>
</tr>
<tr>
<td>Hamstring fl+ex</td>
<td>6.27</td>
<td>6.51</td>
<td>6.77</td>
<td>7.01</td>
</tr>
<tr>
<td>Upper Body</td>
<td>9.70</td>
<td>10.05</td>
<td>10.41</td>
<td>10.75</td>
</tr>
</tbody>
</table>

### Model of annual strength training volume for Bulgarian female sprinters

Statistics from 230 female sprinters, Dimitrov (1980)

<table>
<thead>
<tr>
<th>100m (s)</th>
<th>14.6</th>
<th>14.0</th>
<th>13.4</th>
<th>12.8</th>
<th>12.2</th>
<th>11.6</th>
<th>11.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weights (t)</td>
<td>0</td>
<td>22</td>
<td>45</td>
<td>67</td>
<td>90</td>
<td>112</td>
<td>135</td>
</tr>
<tr>
<td>Jumps (n)</td>
<td>1500</td>
<td>2670</td>
<td>3830</td>
<td>5000</td>
<td>6170</td>
<td>7330</td>
<td>8500</td>
</tr>
</tbody>
</table>
The hardest training was working with weights. On rare occasions, I lifted more than 25kg. Coaches were very angry because the norm was 40 - 50kg…

Lyudmila SAMOTYOSOVA, 100m World Record 11.1 in 1968
Diagnostic - Performance profile
for Annegret RICHTER (FRG, 100m 11.04 WR & Olympic Champion in 1976) compared to another sprinter

Letzelter (2005)
Examples of studies on specificity of training exercises for GDR female sprinters

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>5 x ½ Squat (kg)</th>
<th>5 Hops (m)</th>
<th>10 bound strides (m)</th>
<th>10 bound strides (m/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30m blocks</td>
<td>-0.79</td>
<td>-0.70</td>
<td>-0.84</td>
<td>-0.68</td>
</tr>
<tr>
<td>30m flying</td>
<td>-0.86</td>
<td>-0.41</td>
<td>-0.41</td>
<td>-0.40</td>
</tr>
</tbody>
</table>
### Evolution of strength training principles for GDR sprinters

<table>
<thead>
<tr>
<th>Athlete</th>
<th>Year</th>
<th>Best Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christa STUBNICK</td>
<td>1956</td>
<td>11.5</td>
</tr>
<tr>
<td>Hannelore RAEPKE</td>
<td>1963</td>
<td>11.4</td>
</tr>
<tr>
<td>Petra VOGT</td>
<td>1969</td>
<td>11.3</td>
</tr>
<tr>
<td>Renate STECHER</td>
<td>1973</td>
<td>10.8</td>
</tr>
<tr>
<td>Marlies GÖHR</td>
<td>1977</td>
<td>10.6</td>
</tr>
</tbody>
</table>

- **Christa STUBNICK** (1956, 11.5)
  - Height: 159cm
  - Weight: 52kg
  - General Strength exercises
  - Low to medium training loads
  - Up to 2 workouts per week

- **Hannelore RAEPKE** (1963, 11.4)
  - Height: 165cm
  - Weight: 50kg
  - Use of various methods: maximum, speed, general, isometric strength
  - Low to medium loads
  - Strength training only for a short period

- **Petra VOGT** (1969, 11.3)
  - Height: 172cm
  - Weight: 61kg
  - Lifting & jump exercises with and without loads
  - General Strength
  - Strength training all year but not much variation in training volume

- **Renate STECHER** (1973, 10.8)
  - Height: 170cm
  - Weight: 73kg
  - Analytical work based on biomechanical requirements for each section of the race
  - Start & acceleration improvements depend on the increase of maximum strength
  - Limited work on horizontal jumps

- **Marlies GÖHR** (1977, 10.6)
  - Height: 165cm
  - Weight: 55kg
  - General strength of high volume & low intensity all year
  - Endurance and max strength developed concurrently with specific strength
  - Huge emphasis on vertical jumps
Organisation of training for Eva GLESKOVÁ (TCH, 100m WR 11.0 in 1972) – Pavol GLESK
### Weekly load & content of strength training for all-time top sprinters 1962

<table>
<thead>
<tr>
<th>Athlete</th>
<th>Average 100m Time</th>
<th>Weekly Load</th>
<th>Content of Strength Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilma RUDOLPH</td>
<td>11.18w</td>
<td>2 (2 mix)</td>
<td>Lots of hills twice a week, No weights* Train 5 days/week, 2x/day before OG’60</td>
</tr>
<tr>
<td>Dorothy HYMAN</td>
<td>11.43w</td>
<td>2 (2 mix)</td>
<td>Press-Ups, Step-Ups, Trunk Curls, Astride Jumps, Chins, Squat Jumps (circuits)</td>
</tr>
<tr>
<td>Vera KREPKINA</td>
<td>11.3</td>
<td>1 (1 mix)</td>
<td>Jumps, Weight lifting, Isometrics, sled &amp; hills</td>
</tr>
<tr>
<td>Marjorie JACKSON</td>
<td>11.3</td>
<td>2 (2 mix)</td>
<td>Isometrics, Calisthenics, light Weights</td>
</tr>
<tr>
<td>Betty CUTHBERT</td>
<td>11.3</td>
<td>2 (2 mix)</td>
<td>Isometrics (1 UB &amp; 2LB), Calisthenics, Hills (sand dunes) No Weights (unlike all other girls of the group)</td>
</tr>
<tr>
<td>Maria ITKINA</td>
<td>11.4</td>
<td>2 (2 mix)</td>
<td>Weight lifting, Jumps, Isometrics, sled &amp; hills</td>
</tr>
<tr>
<td>Cath. CAPDEVIELLE</td>
<td>11.4</td>
<td>0</td>
<td>Only 2 running workouts/week, no track and no indoor</td>
</tr>
<tr>
<td>Jutta HEINE</td>
<td>11.4</td>
<td>0</td>
<td>No Weight training</td>
</tr>
<tr>
<td>Christa STUBNICK</td>
<td>11.5</td>
<td>2 (2 mix)</td>
<td>Jumps, Gym, light weights, MB throws, short split runs!</td>
</tr>
<tr>
<td>Teresa CIEPLA</td>
<td>11.5</td>
<td>2 (1 mix 1 LB)</td>
<td>Squat and circuit training</td>
</tr>
<tr>
<td>Name</td>
<td>Country</td>
<td>Time</td>
<td>Load</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Florence Griffith</td>
<td>USA</td>
<td>10.49</td>
<td>4 (2 LB 2 UB) after</td>
</tr>
<tr>
<td>Carmelita Jeter</td>
<td>USA</td>
<td>10.64</td>
<td>4 (2 LB 2 UB) before</td>
</tr>
<tr>
<td>Marion Jones</td>
<td>USA</td>
<td>10.70</td>
<td>4-5 (2 LB 2 UB 1 Mix)</td>
</tr>
<tr>
<td>Shelly-Ann Fraser</td>
<td>JAM</td>
<td>10.70</td>
<td>3 (3 Mix) after</td>
</tr>
<tr>
<td>Christine Arron</td>
<td>FRA</td>
<td>10.73</td>
<td>2 (2 Mix) diff</td>
</tr>
<tr>
<td>Merlene Ottey</td>
<td>JAM</td>
<td>10.74</td>
<td>2 (2 Mix) am</td>
</tr>
<tr>
<td>Kerron Stewart</td>
<td>JAM</td>
<td>10.75</td>
<td>2 (2 Mix)</td>
</tr>
<tr>
<td>Evelyn Ashford</td>
<td>USA</td>
<td>10.76</td>
<td>4 (4 Mix) pm</td>
</tr>
<tr>
<td>Veronica Campbell</td>
<td>JAM</td>
<td>10.76</td>
<td>3 (3 Mix)</td>
</tr>
<tr>
<td>Irina Privalova</td>
<td>RUS</td>
<td>10.76</td>
<td>4 (4 Mix) after</td>
</tr>
</tbody>
</table>
### Weekly load & content of strength training for all-time top sprinters \textit{1962 v 2012}

<table>
<thead>
<tr>
<th>Year</th>
<th>Weekly Load</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>11.2, 11.5</td>
<td>Jumps, Calisthenics, Isometrics, light Weights</td>
</tr>
<tr>
<td>2012</td>
<td>10.49, 10.77</td>
<td>Heavy/Light Weights, Bodybuilding, Olympic lifts, Jumps</td>
</tr>
</tbody>
</table>
Willandra Lakes, Australia