



Ron LeMaster, 2003

Skiing From the Snow Up

*Current Trends In
Alpine Ski Technique*

Ron LeMaster

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Overview

- Present a framework of movement patterns for analyzing ski technique
- Discuss how skiing has changed in the past 40 years, and how it hasn't

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My Approach

- Watch the best skiers
- Analyze movements in independent categories
- Distinguish between methodology and technique

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Methodology and Technique

- Technique
 - The movements that the athlete makes, as described objectively by an external observer
 - This is *not* what you teach
- Methodology
 - The information presented to the athlete with the intention of eliciting the desired behavior
 - Usually subjective in nature (kinesthetic, visual, emotional)

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Movement Patterns

- Basic Movements
 - Determined by basic physics and physiology
 - Relatively unchanged since the advent of fiberglass skis and plastic boots
- Application of patterns has changed
 - In response to changes in equipment
 - Ratios, relative amplitudes and timing

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My Buckets

- Fore-aft
- Turning the Ski
- Edging
- Lateral
- Up and Down

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Why These Buckets?

- Each type of movement is made for a different reason
- A great skier can move independently in each of these ways, as dictated by the situation

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Fore-Aft



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Why?



- Controls ski's self-steering effect
 - Forward, ski turns more
 - Aft, ski turns less
- Anticipatory moves

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Fore-Aft

- Changed little
 - Adjustments made at the ankle
 - Upper body comes back sometimes entering turn
- Forward pressure early in turn
- Complete turn on heel of foot

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Anticipatory Moves



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Turning the Skis



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Why?



- To make turns sharper than the ski's self-steering effect will produce on its own
- To slow down

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Turning the Skis



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Turning the Ski

- Relative amplitude is less, in general, because skis allow for smaller initial steering angles
- But...
 - There's still a lot of redirection in many turns
 - Leg rotation still the dominant and preferred technique
 - Windup-release (anticipation) still used
 - Pole plant still used in slalom

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Edging

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Why?

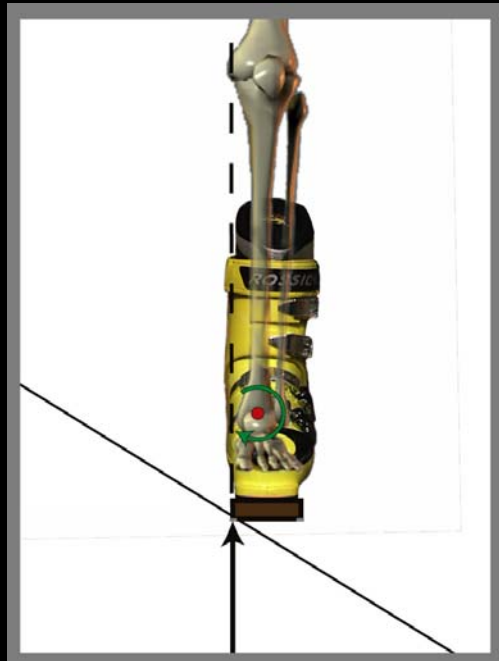
- To control how much the ski grips or slips as a whole
- To control how much the tip and tail grip, and hence, how tightly the ski turns

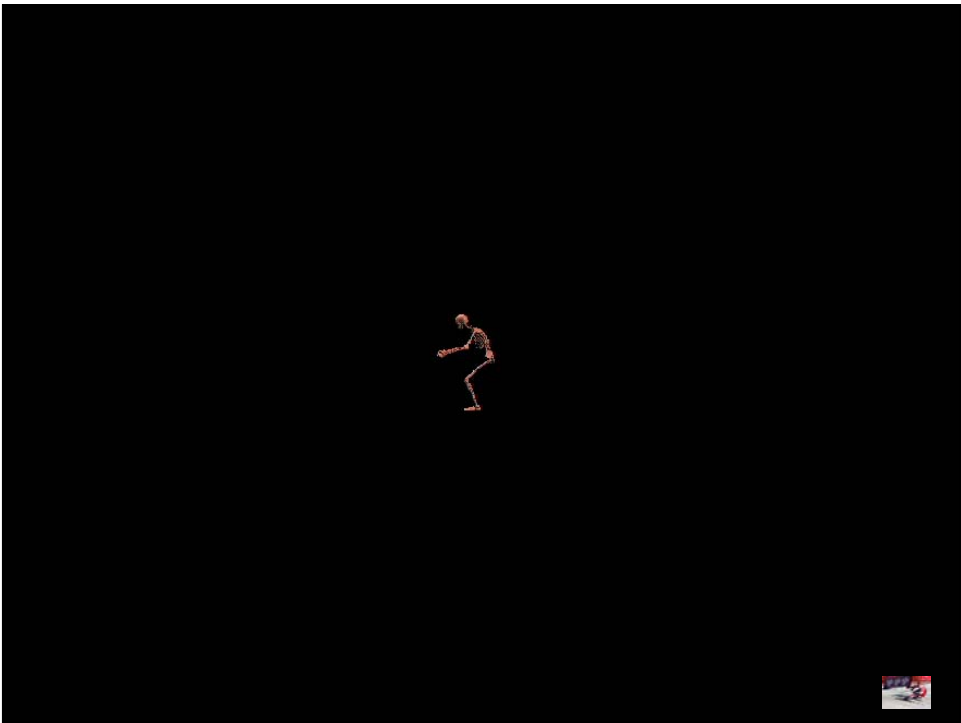
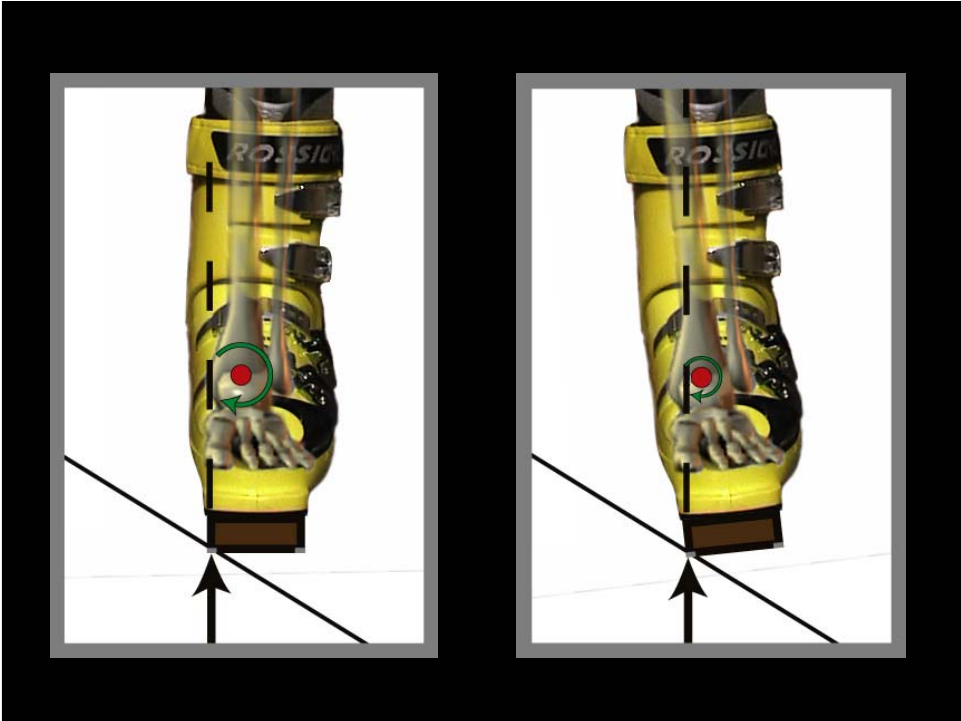
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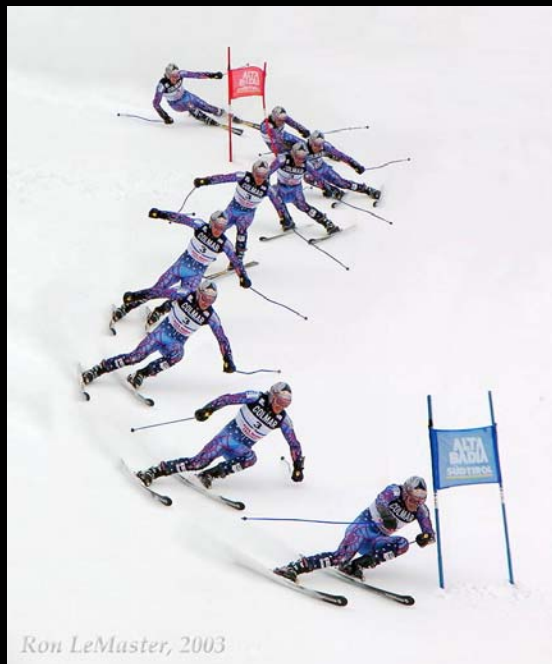
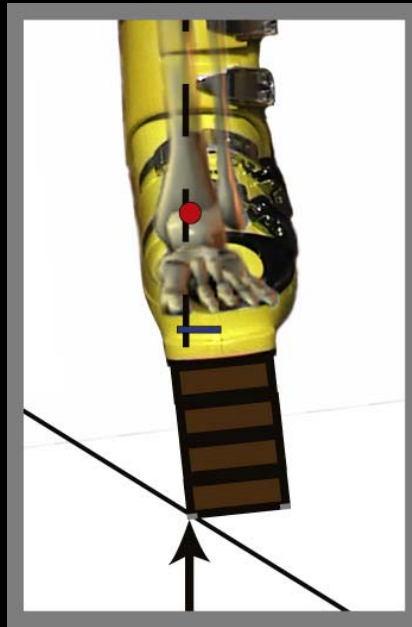
Edging

- Edge angles much greater
 - Due to greater inclination
- Less angulation
 - Ski width
 - Lifters
- Edging inside ski much more
- Fewer edgesets

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Countering



- Aligns body so best muscles are used for to balance against force of turn
- Dictated by amount of hip angulation

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Methodology and Technique

- Teaching method
 - “Face down the hill.”
 - “Stand square on your skis.”
 - “Support yourself with your skeleton.”
- Technique
 - “Counter so that the best muscles are doing the work.”

Lateral Movements



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Why?



- To balance against centrifugal force
- To create major edge angle so the ski will bend
- To control distribution of pressure between the outside and inside skis

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Lateral Movements

- Big changes
 - Because every year skis hold better and carve tighter arcs
- Increased inclination
 - All sorts of ramifications
- Increased use of the inside ski
- Fewer edge sets

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Sub-Topics

- Change in stance
- Increased use of the inside ski
- More aggressive transitions

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Increased Inclination

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Inclination's Effect on Stance

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forsyth-1.mov



Stance

- Tips and toes *do not* line up with hips and shoulders anymore
 - Alignment of hips and shoulders is dictated by hip angulation and countering
 - Alignment of tips and toes is dictated by inclination

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Width of Stance

- Greater inclination
 - Skier standing on steeper effective slope
 - More difference between flexion of inside and outside legs
 - Wider stance (both lateral and fore-aft)

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Methodology and Technique

- Teaching Method
 - “Pull your inside foot back so there is no lead change.”
- Technique
 - “Keep the fore-aft pressure the same on your inside and outside skis by keeping your ankles equally flexed.”

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Inside Ski

- Because skis hold so well and bend easily, skier doesn't have to put all the weight on outside ski all the time
- Inside ski provides for lots of options
 - Radius control
 - Support at top of turn while outside ski is hooking up

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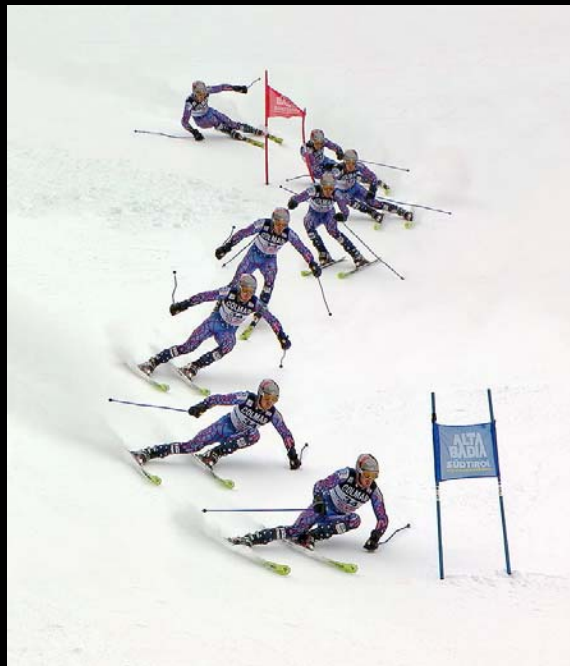


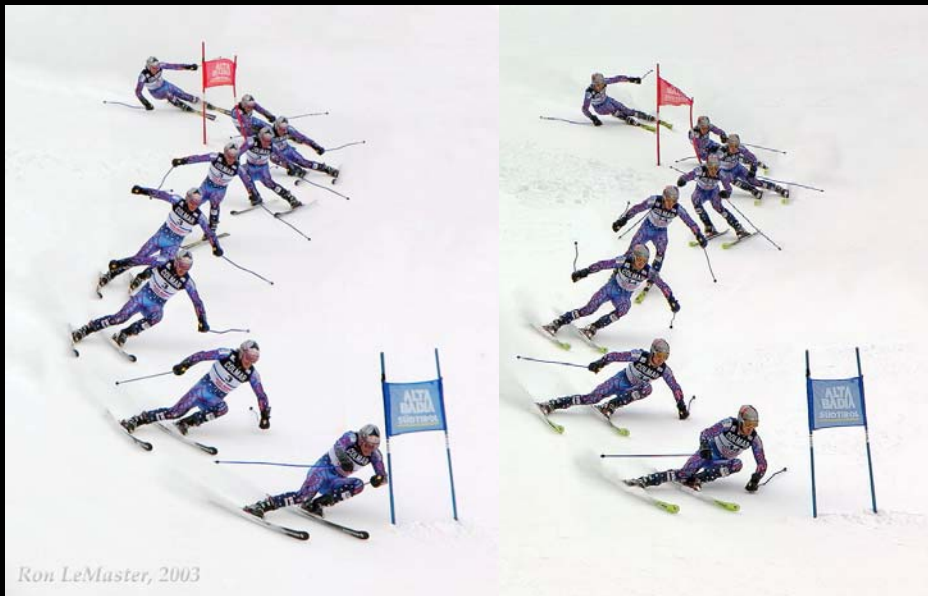
Transition





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Methodology and Technique

- Teaching Method
 - “Always be in balance.”
- Technique
 - “Topple effectively.”

Methodology and Technique

- Teaching Method
 - “Project your center of mass down the hill.”
- Technique
 - “Put your body out of balance so your line of motion crosses the path of your feet.”

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Inclination and Transition

- Big increase in inclination
 - To balance against big centrifugal forces
- Very aggressive transitions
 - To get from steeply inclined in one turn to steeply inclined in the next
- Few edgesets
 - Reduces need for pole plant

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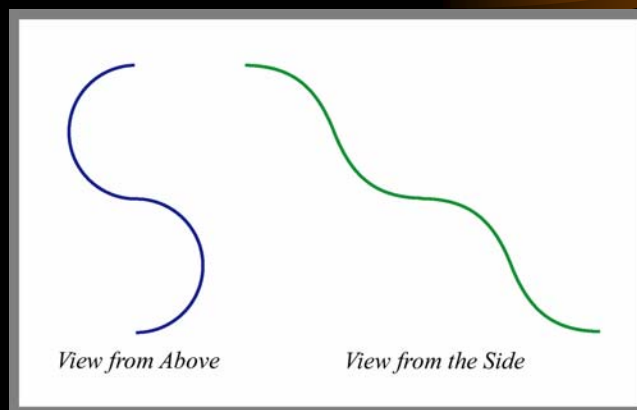
Up and Down

Why?

- To control force between skier and snow
 - Reduce force when you want to redirect the skis or avoid getting launched by a bump
 - Increase force when you want the snow to make you turn, or you want to get launched

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The Virtual Bump



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Retraction

- Greater inclination
 - Bigger “virtual bump” between turns
 - Bigger upward forces between turns
 - **More retraction**









When, and How Much?

- It depends...
 - On the distance between the turns
 - On how far the turns come out of the fall line
 - The style of the skier





Summary

- Separate movement patterns into sensible categories
- Fore-aft takes place mostly in the ankles, and hasn't changed much since the advent of plastic boots
- The preferred technique for turning the skis is still leg rotation, but there is less need for it

Summary (cont.)

- Angulation and countering movements are still with us, but somewhat reduced because of narrower skis and lifters
- Softer, better holding skis allow us to make more use of the inside ski

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Summary (cont.)

- Greater inclination has resulted in
 - “wider” stance and greater “lead change”
 - more dramatic transitions
 - more turns with retraction

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That's All, Folks!



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