ISBS:

IN THE BEGINNING . . .

John Z. Ostarello, PhD
Professor Emeritus
Department of Kinesiology
California State University, East Bay
Hayward, California, U.S.A.
Juris Terauds
The Father Of ISBS
Juris Terauds
The Father of ISBS

Idea
A vision for ISBS
Time
Money
Ego-None
Prologue
1976
Nadia Comaneci
Star of the Games.
First gymnast in Olympic history to be awarded the perfect 10.0. Awarded 10.0 mark seven times.
Steve Jobs
Steve Wozniak
start
APPLE COMPUTER
Rocky

1976
Academy
Award
Winner
In The Beginning . . .
Before There Was Sports Biomechanics
There Was:
DARK Sports Biomechanics
Thomas K. Cureton
1901-1992
Thomas K. Cureton
Father of Physical Fitness
Physical Fitness Research Laboratory
University of Illinois 1941-1969
Primary Focus Was On All Aspects of Physical Fitness
Also Wrote Articles About
The Application of Physics to Sport

Physics Applied to Physical Education – 1932
Mechanics of the Track Racing Start – 1935
Mechanics of Track Running – 1935
Mechanics of the Broad Jump – 1935
Mechanics of the High Jump – 1935
Mechanics of the Shot Put – 1935

Elementary Principles & Techniques of Cinematographic Analysis as Aids in Athletic Research - 1939
Franklin Henry

“The Father of Motor Learning”
Interested in Athletic Performance

Publications:

Prediction of World Records Running Sixty Yards to Twenty-six Miles – 1955

Time-Velocity Equations and Oxygen Requirements of All-Out vs Steady-Pace Running – 1954

Force-Time Characteristics of the Sprint Start - 1952
Force-Time Characteristics of the Sprint Start – F.M. Henry, Research Quarterly 1952
Standing Sprint Start

Andrew Ostarello – Effectiveness of Three Sprint Starts: A Longitudinal Case Study
ISBS San Francisco 2001
Effectiveness of the Standing Start

Paul Nash
Republic of South Africa

Tied the World Record (10.0s) for 100 meters 3 times in 1968
4 February 1968 – 1740m above sea level
4 June 1968 – 1000m above sea level
4 June 1968 – 1000m above sea level
Reported to have used a standing start.

Jim Hines ran 9.9s to win the 1968 Olympic Games – 2248 m ASL
The Road to ISB

1st International Seminar on Biomechanics – Zurich 1967
   Organized by Jurg Wartenweiler - Switzerland
2nd International Seminar on Biomechanics – Netherlands 1969
3rd International Seminar on Biomechanics – Rome 1971
4th International Seminar on Biomechanics – Penn State Univ 1973
   Organized by Richard C. Nelson – U.S.A.
Richard C. Nelson
1932-2020
International Society of Biomechanics – ISB
Established at the 4th International Seminar On Biomechanics at Penn State University - 1973
The ISB Promotes the Study of ALL Areas of Biomechanics at the International Level.

Including:
Anatomy - Physiology - Engineering (Mechanical, Industrial, Aerospace, etc) - Orthopedics - Rehabilitation - Sport Science - Medicine - Electrophysiolgy – Kinesiology – Etc.
“In 1969… I was advised that Dr. Richard Nelson was starting a unique program in biomechanics of sport at Penn State University. Much of my success can be traced back to the years I spent at Penn State. Dick's (Richard Nelson) efforts... were instrumental in creating a new discipline: “Biomechanics of Sport.”
The Road to ISBS
Montreal Olympic Biomechanics Cinematography - 1976
Research team led by Juris Terauds

University of Alberta - 1977
Philosophical conversations with Geoff Dyson

University of Alberta - 1978
Clinic for High Speed Biomechanics Cinematography

Edmonton, Alberta - 1978
Commonwealth Games

Sabbatical Leave - 1979-1981
Terauds communicates with 40+ sports scientists
Advance Program

Second International Symposium of Biomechanics Cinematography and High Speed Photography

August 24-26, 1981

Sponsored by

SPIE—The International Society for Optical Engineering
The Research Center for Sports
The American Society of Biomechanics
The International Society of Biomechanics
and
The Track and Field Association of the USA

To be held in conjunction with

SPIE’s 25th Annual International Technical Symposium

August 24-28, 1981
Town & Country Hotel
San Diego, California
SPIE: Society of Photo-Optical Instrumentation Engineers

Now:

SPIE: The International Society for Optical Engineering.
Second International Symposium of Biomechanics Cinematography and High Speed Photography
August 24-26, 1981

Chairman: Juris Terauds, Research Center for Sports
Scientific Committee: Marlene Adrian, Washington State Univ.; Anne E. Atwater, Univ. of Arizona; John Cooper, Indiana Univ.; Harold E. Edgerton, Massachusetts Institute of Technology; Lincoln L. Endelman, The Perkin-Elmer Corp.; Robin E. Herron, Univ. of Akron and Northeastern Ohio Universities College of Medicine; William G. Hyzer, Janesville, Wisconsin; Charles E. Miller, Massachusetts Institute of Technology; Stanley Plangelhoef, Univ. of Massachusetts; Melvin R. Ramey, Univ. of California at Davis; George Silverberg, Naval Weapons Center; Hallock F. Swift, International Applied Physics, Inc.; James Walton, General Motors Research Lab.; Ronald F. Zernicke, Univ. of California at Los Angeles.
August 1981

Second International Symposium of Biomechanics, Cinematography and High Speed Photography

“I can only hope that this symposium will again serve to bridge some gaps among disciplines, among technologies, and between researchers and practitioners.”

Juris Terauds
Harold E. Edgerton
Massachusetts Institute of Technology
"PAPA FLASH"

Invented the Electronic Flash in 1931
Pioneered strobe photography

Famous Milk Drop
INTRODUCTION TO...

High-Speed Photography

by WILLIAM G. HYZER

A 10-part series reprinted from Photomethods magazine.
George Silberberg  
Naval Weapons Center  
China Lake, California  

Introduced a Shuttered Video Camera  
1/1000 second shutter  

Cost: 47,000 – 1981 U.S. Dollars  
156,980 – 2023 U.S. Dollars
He Jumped, he shot, he changed the game.
Early 1930's

John Cooper
Indiana University
Why Was This Template Important?

Saved Time Locating Centers of Gravity.

This had to be done about 15 times or more. Once for each film frame that needed to be analyzed.
You will be relieved to know that James Walton had a career beyond the Walton Template.

He worked for General Motors auto manufacturer as an engineer with their crash testing program while maintaining an interest in Sports Biomechanics.
Star Formation
Thursday 27 August 1981 10:00 A.M.
Town & Country Hotel, San Diego, CA

Marlene Adrian
Jim Crakes
Hans Gros
Anne Klinger
Irakis Kollias
John Kuntz
John Ostarello
Stan Plagenhoeff
Juris Terauds
Jim Walton
Discussion

Viability of an international organization. "Iron Curtain" - "Cold War"

Enough practitioners around the world to support an organization.

Only test of viability was to create an organization and test the waters.

The vast majority voted to go forward.
Results

Name:
International Society of Biomechanics in Sports.

Mission:
"The study of SPORTS Biomechanics."

Purposes:
Dissemination of sports biomechanics information.
"Bridging the Gap."
Encourage research.

Action:
Set date/place for First International Symposium.
Pro Tempore Officers

Juris Terauds - President
Marlene Adrian - Vice President
David Kelley - Vice President
Mitsumasa Miyashita - Vice President
Jim Crakes - Executive Secretary
Problem: Who would provide the money?
Research Center for Sports
Juris Terauds, President
Guaranteed the funding.
Very Hot Topic for 1982

Film or Video?
Early Symposia
Failure was not an option.

Many in biomechanics felt the new group would not survive.

Successful meeting essential to prove interest in SPORTS biomechanics.

Essential to move the Society forward.
**MONDAY**

**SALOMON HALL**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>9:00-10:00</td>
<td>OPENING CEREMONIES: Jim CRATES, Point Loma College</td>
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<td>Juris TERAUDS, Chairman ISBS</td>
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<td>KEYNOTE: John M. COOPER, Indiana University</td>
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<td>TOPIC: “HISTORICAL OVERVIEW OF BIOMECHANICS”</td>
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<td>10:00-10:30</td>
<td>Coffee Break</td>
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<td>10:30-11:00</td>
<td>Stanley PLAGENKOF, Presiding</td>
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<td>11:00-11:45</td>
<td>BASIC BIOMECHANICS APPLICATIONS FOR THE COACH</td>
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<td>ATWATER, Anne E.</td>
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<td>11:45-12:00</td>
<td>WHAT THE BIOMECHANICS RESEARCHER TELLS THE DIVING</td>
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<td>COACH AND WHAT THE COACH TELLS THE RESEARCHER</td>
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<td>KELLER, Doris</td>
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<td>12:00-12:20</td>
<td>INTRODUCTION TO BIOMECHANICS CINEMATOGRAPHY AND</td>
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<td>VIDEO AS TOOLS FOR THE RESEARCHER AND COACH</td>
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<td>TERAUDS, Junia</td>
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<td>12:20-13:15</td>
<td>Lunch</td>
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<td>John COOPER, Presiding</td>
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<td>13:15-13:45</td>
<td>STATE OF THE ART IN BIOMECHANICS CINEMATOGRAPHY AND</td>
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<td>HIGH SPEED VIDEO MOTION ANALYSIS</td>
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<td>TERAUDS, Junia</td>
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<td>13:45-14:30</td>
<td>DATA ACQUISITION FOR BIOMECHANICAL ANALYSIS OF A</td>
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<td>SPORTS SKILL USING BIOMECHANICS CINEMATOGRAPHY AND</td>
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<td>HIGH SPEED VIDEO PROCEDURES</td>
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<td>MCKITTRICK, Charles &amp; TEE, Philip</td>
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<td>14:30-15:00</td>
<td>DISCUSSION FOR ALL INTERESTED PERSONS: “BRIDGING THE</td>
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<td>GAP” BETWEEN THE BIOMECHANICS RESEARCHER AND THE COACH</td>
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<td>ATWATER, Anne E. ’Betty’ &amp; KELLER, Doris (mediatronics)</td>
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<td>15:00-15:30</td>
<td>Dinner</td>
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<td>15:30-16:00</td>
<td>CRUSADER TROPHY ROOM</td>
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<td>16:00-16:30</td>
<td>CRUSADER TROPHY ROOM</td>
</tr>
<tr>
<td>19:00-20:00</td>
<td>BOARD OF DIRECTORS MEETING: INTERNATIONAL</td>
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<td>SOCIETY OF BIOMECHANICS IN SPORTS</td>
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**AT POINT LOMA COLLEGE**

3900 LOMALAND DRIVE
SAN DIEGO, CA 92106 U.S.A.
135 participants
41 papers
One session at time
9 sponsors/exhibitors

Instrumentation Marketing Corporation
Kistler Instrument Corporation
Lafayette Instrument Company
L-W International
Phot-Sonics, Inc.
Spin Physics, Inc.
Tri Tronics, Inc.
Video Logic Corporation
Redlake Corporation
Two meetings of the Board of Directors
And one General meeting yielded these results:

1. Publish a journal to be called, "Journal of Biomechanics in Sports"
2. Sponsor an annual symposium
3. Investigate sites for future meetings.
   *China was suggested*
4. Draft a constitution
5. Create a logo
Purpose of ISBS

The purpose of ISBS is to serve the population of biomechanists interested in, and working with, biomechanics in sports

1. Disseminate information and promote research
2. Bridge the Gap between researcher and practitioner
3. Encourage pure and applied biomechanics research
4. Conduct research at national and international competitions
5. Coordinate biomechanics cinematography at international competitions
6. Conduct educational clinics for teachers, coaches, athletes, trainers, etc
Asks Questions
1. Could ISBS promote an ANNUAL conference?
2. Are there enough venues and sponsors?
3. Is one year too little time for researchers to produce papers?
4. How will ISBS meet its international mandate?
5. What about the cost of international travel?
6. How will researchers be able to leave the eastern bloc countries?

Juris Terauds answered these questions
What---Me Worry?

Juris Terauds
So-o-o...

ISBS  Moved directly to the meeting in Colorado Springs – January 1984

Supported by the United States Olympic Committee Sports Medicine Council
First Elected ISBS Executive - 1984

Juris Terauds  President
Marlene Adrian  Vice President
John Cooper  V.P. for Publice Relations
Wolfgang Bauman  V.P. for Membership
Jim Crakes  Executive Secretary
John Ostarello  Treasurer
President’s Commission: “to seek peace, cooperation, and coordination with ISB”

Letter to ISB: “offering information and an olive branch”

Board agreed: “concept of the internationality of ISBS was not negotiable”
Was there really a need for a separate Sports Biomechanics Organization?

Let’s look at a few facts.
The ISB Promotes the Study of ALL Areas of Biomechanics at the International Level.

The purpose of ISBS is to serve the population of biomechanists interested in, and working with, biomechanics in SPORTS.
ISB Journal

Originally:
International Journal of Sports Biomechanics - 1985

ISBS Journal

2002