

SAFETY BULLETIN

December 1998

Volume 8, No. 3

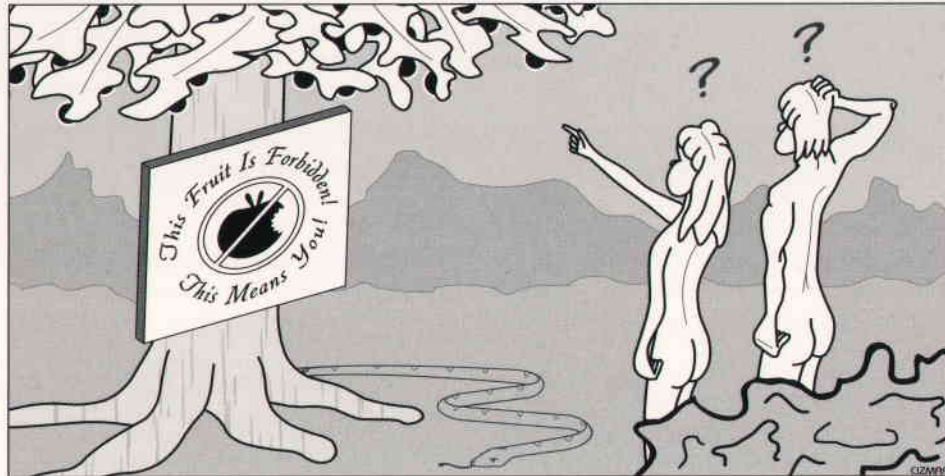

Triodyne Inc.

Consulting Engineers & Scientists - Safety Philosophy & Technology
 5950 West Touhy Avenue Niles, IL 60714-4610 (847) 677-4730
 FAX: (847) 647-2047
 e-mail: info@triodyne.com

GENERAL SAFETY

Safety Potpourri

by Ralph L. Barnett *



"Watch Out For That Tree!" **

1. Warnings

God provided the very first warning; it was promptly ignored by Adam and Eve.¹ As recounted in the book of Genesis, the warning was commanded by the supreme authority figure; it identified the hazard; it specified means for avoiding it; and it described the consequence if not heeded.

Genesis:

Chapter II

16 And the Lord God commanded the man, saying, of every tree of the garden thou mayest freely eat:

17 But of the Tree of the Knowledge of Good and Evil, thou shalt not eat of it: for on the day that thou eatest thereof thou shalt surely die.

22 And the rib, which the Lord God had taken from man, made he a woman, and brought her unto the man.

Chapter III

6 And when the woman saw that the tree was good for food, and that it was pleasant to the eyes, and a tree to be desired to make one wise, she took of the fruit thereof, and did eat, and gave also unto her husband with her; and he did eat.

2. Statistics

Three specific statistical observations are described that have profound general significance and provide object lessons for interpreting statistical inferences.

A. *The average person has one breast and one testicle.* This obvious silliness arises from a problem that is improperly formulated. There are subtle scenarios that lead to the same type of error. For example, the fiftieth percentile man exhibited in anthropometric drawings is constructed from human elements whose sizes all

* Professor, Mechanical and Aerospace Engineering, Illinois Institute of Technology, Chicago, and Chairman, Triodyne Inc., Niles, IL.

** Jay Ward Productions' *George of the Jungle*.

MECHANICAL ENGINEERING:

Triodyne Inc.

(Est. 1969)

Officers

Ralph L. Barnett
 Dolores Gidin
 S. Carl Uzgras

Mechanical Engineering

Dennis B. Brickman
 Michael A. Dilch
 Christopher W. Farrone
 Suzanne A. Gowski
 John M. Gosbelbecker
 Crispin Hales
 Dror Kopernik
 Woodrow Nelson
 Peter J. Poczynski
 Audrone M. Stokas
 William G. Switalski
 George J. Trezek
 James R. Wingfield

Library Services

Marna S. Sanders
 Barry Sellows
 Maureen Vela
 Jan A. King
 Florence Laskey
 Neil Miller
 Jackie Schwartz
 Peter Warner

Information Products

Expert Transcript
 Center (ETC)
 Marna S. Sanders
 Glenn Warner

Training and Editorial Services

Paula L. Barnett

Video Services

Andrew B. Cizmar

Graphic Communications

Andrew B. Cizmar
 Charles D'Ecchia

Model Laboratory

2721 Alston Lane
 Wilmette, IL 60091-2101
 Bill Brown

Vehicle Laboratory

Charles Sinkovits
 Matthew J. Ulmanstine

Photographic Laboratory

7903 Backwith Road
 Morton Grove, IL 60053
 Larry Good

Business Systems

Chris Ann Gonatas
 Jennifer Bliton
 Cheryl Black
 Sandie Christensen
 Sandra Prieto

FIRE AND EXPLOSION:

Triodyne Fire &

Explosion Engineers, Inc.

(Est. 1987)

2907 Butterfield Road
 Suite 120
 Oak Brook, IL 60521-1176
 (630) 573-7707
 FAX: (630) 573-7731

Officers/Directors

John A. Campbell
 Ralph L. Barnett
 S. Carl Uzgras

Engineering

John A. Campbell
 Scott M. Howell
 Kim R. Mrozowski
 Norbert R. Onizula

RECREATION ENGINEERING:

Triodyne Recreation

Engineering, Inc.

(Est. 1994)

5950 West Touhy Avenue
 Niles, IL 60714-4610
 (847) 647-9882
 FAX: (847) 647-0785

Officers/Directors

Brian D. King
 Jeffery W. Abendshien
 Ralph L. Barnett
 S. Carl Uzgras

Engineering/Science

Brian D. King
 Jeffery W. Abendshien
 Patrick M. Brinckhoff

SAFETY RESEARCH:

Institute for Advanced

Safety Studies

(Est. 1984)

5950 West Touhy Avenue
 Niles, IL 60714-4610
 (847) 647-1101

Chairman of the Board

Ralph L. Barnett

Director of Operations

Paula L. Barnett

Information Services

Marna S. Sanders
 Senior Science Advisor
 Theodore Liber

MANUFACTURING:

Alliance Tool & Mfg. Inc.

(Est. 1945)

91 East Wilcox Street
 Maywood, IL 60153-2397
 (312) 381-1712
 (708) 345-5444
 FAX: (708) 345-4004

Officers:

S. Carl Uzgras
 Ralph L. Barnett

General Manager

Ramresh Gandhi

Plant Manager

Ray Gach

Founders/Consultants

Joseph Gansacz
 Albert Kankula

CONSTRUCTION:

Triodyne-Wangler

Construction Company Inc.

(Est. 1993)

5950 West Touhy Avenue
 Niles, IL 60714-4610
 (847) 647-8556
 FAX: (847) 647-0785

Officers/Directors/Managers

Joel I. Barnett
 William A. Wangler
 Joseph Wangler
 Ralph L. Barnett
 S. Carl Uzgras

CONSULTANTS:

Richard M. Bick, Ph.D.
 Electromagnetic Compatibility

Claudine R. Giesse Myers
 Biomechanics

Richard Gullickson
 Industrial Hygiene/Safety/Chemistry

Beth A. Hamilton
 Information Science

David W. Levinson, Ph.D.
 Senior Metallurgical Advisor

Steven R. Schmid, Ph.D.
 Food Processing Equipment

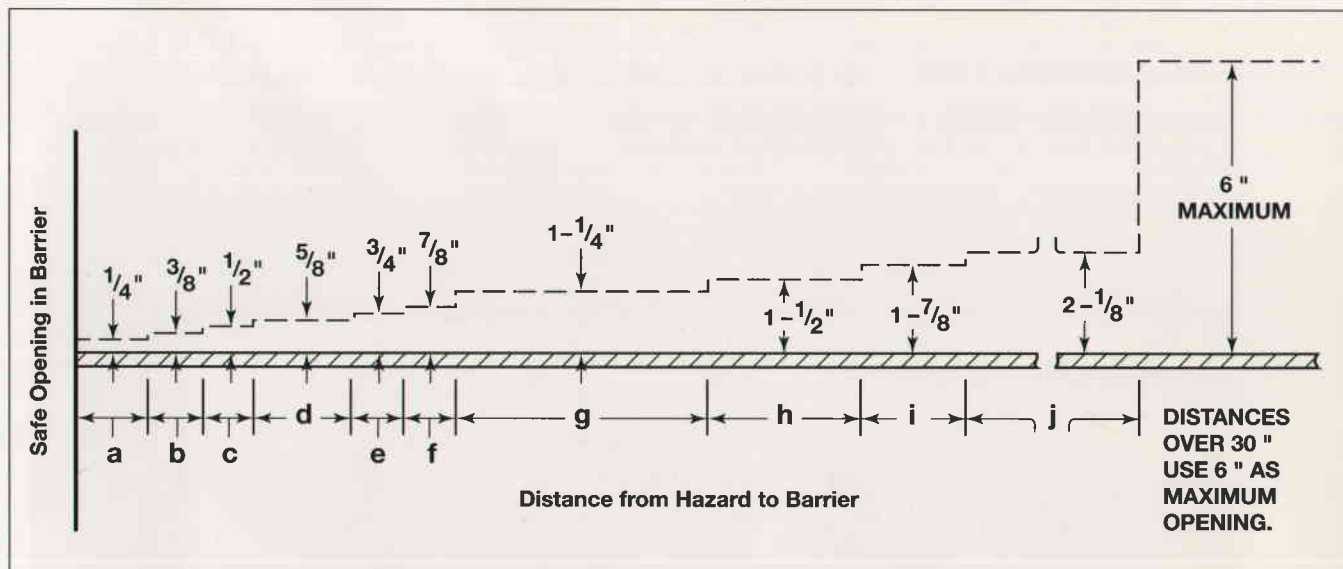


Figure 1 – Barrier Opening - Standoff Distance Relationship

represent the fiftieth percentile. Unfortunately, there is no fiftieth percentile human being. The people with the fiftieth percentile height are different from those with the fiftieth percentile weight or the fiftieth percentile arm length.

- B. Many years ago when the relationship between smoking and lung cancer was first articulated with statistical support, the president of a tobacco group began his convention address as follows: "99.999% of all victims of rectal cancer use toilet paper." This dismissive humor presumes a causation that does not exist. Students of statistics are warned of the flawed results that may arise from simple minded calculations of correlation coefficients.
- C. *Zero probability that an event will occur does not mean that the event is impossible.* Probability is calculated by dividing the number of successful events by the total number of trials. If a finite number of trials are successful, say 12, and it takes an infinite number of attempts to achieve them, the fraction or probability is zero. This is a cornerstone observation in statistics.²

3. Anthropometric Guarding

Point of operation barriers often contain slots or openings to accommodate the insertion of work pieces into processing machinery. Openings, of course, allow operators to reach through the barriers in the direction of the hazard. For safety, barrier guards are located a sufficient distance from hazards to prevent contact. The relationships between safe guard openings and their "standoff distances" were developed in 1949 by the National Association of Mutual Casualty Companies. They are presented in graphic form in Figure 1 and appear in almost every code and standard concerned with barrier design. These "all important" curves were not scientifically developed through testing. They are based on the dimensions of a woman's hand associated with the smallest glove size; "it was finally decided to use a woman's hand of a 6-1/2 glove size as the basic test hand."³

4. The Wild Hog

A bizarre accident involving Evil Knievel, 60, was reported by Time Magazine.⁴ This daredevil, who has broken nearly every bone in his body in ill-fated jumps, was injured by a benign Harley Davidson. His parked motorcycle fell over and pinned him to the ground. He was rescued by neighbors who heard his pleas for help.⁵

5. Important Instructions and Warnings on Consumer Goods

- On a bag of Fritos:
You could be a winner! No purchase necessary. Details inside.
- On a hotel-provided shower cap in a box:
Fits one head.
- On Tesco's Tiramisu dessert:
Do not turn upside down. (Printed on the bottom of the box)
- On Marks & Spencer Bread Pudding:
Product will be hot after heating.
- On packaging for a Rowenta Iron:
Do not iron clothes on body.
- On Boot's Children's Cough Medicine:
Do not drive car or operate machinery.
- On a Korean kitchen knife:
Warning: keep out of children.
- On a string of Chinese-made Christmas lights:
For indoor or outdoor use only.
- On Sainsbury's Peanuts:
Warning: contains nuts.
- On an American Airlines packet of nuts:
Instructions: open packet, eat nuts.
- On a Swedish chainsaw:
Do not attempt to stop chain with your hands.

References

- 1 Genesis, 3:6.
- 2 Barnett, R. L., "Reasonably Foreseeable Use," *Triodyne Safety Brief*, Vol. 14, No. 3, November 1998.
- 3 "Safe Openings for Some Point of Operation Guards," *American Mutual Insurance Alliance, Technical Guide No. 2, Third Edition*, May 1966.
- 4 *Time* (November 16, 1998), pg. 133.
- 5 Kopernik, D., "On the Safety of Motorcycle Side Stands," *SAE 840905*, Society of Automotive Engineers, Washington, D.C., May 21-24, 1984.