William of Occam, an English philosopher of the fourteenth century, stated a heuristic in Latin (of course), which has been translated into English by Starfield, Smith and Bleloch as follows: “Things should not be multiplied without good reason.” The authors reinterpret this as “…one should eliminate all unnecessary information relating to the problem that is being analyzed.” This heuristic has become known as Occam’s Razor, because we use it to cut away the parts of the real world (or perceived real world) that are unnecessary to model the event or physical item that we wish to analyze. We engineers use this all the time when we model the physical world. Occam’s Razor has also come to mean that if there are different explanations for an event, the simplest explanation is the correct one. This concept appears in popular culture: the movie Contact, Robert Ludlum’s novel The Ambler Warning, and the TV series “NUMB3RS.”

The 9/11 conspiracy theorists claim that the official National Institute of Standards and Technology (NIST) theory – that the twin towers collapsed due to fire weakening the structures following severe damage from airplane impacts – is too complicated, whereas collapse due to controlled demolition is the simpler explanation and, therefore, the correct explanation. I think just a little critical thinking will lead to the conclusion that collapse due to sever impact damage followed by extensive fire caused the Twin Towers is the simpler explanation.

The conspiracy theorists claim that debris ejected laterally proves explosions from controlled demolition; however, they do not compare the size of a charge necessary to eject a steel beam to the normal size of charges used in controlled demolition. They claim that the dust ejected laterally is evidence of explosions without showing videos of known demolitions where large amounts of dust and structural parts are ejected from high floors. They claim that some mysterious workmen were observed in the towers in the months prior to September 11 without discussing how many men might be required and how long it might take them (Continued on Page 2)

Accessible Fine Arts Table (Student Project)

Article by: Kristine Low

Tables are typically designed without any potential for height adjustment which, for a person in wheelchair, is a disadvantage. At San Francisco State University a solution was needed which gave seating for five people with ample legroom and table room and also accommodated wheelchair access. The Accessible Fine Arts Table is a design to vary the height of the table while keeping the overall design access to all as well as be sustainable in energy and materials. This redesign of an existing table at San Francisco State University is located on the south side of the Fine Arts Building. It was originally installed in 2004 and was designed in conjunction with the SFSU Building and Grounds Department and the SFSU Design and Industry Department. The students who contributed towards the redesign were Kristine Low, John Becker, Josh White and Matthew Willman.
Occam’s Razor

(Continued from Page 1)

to place the 30,000 to 50,000 charges required for controlled demolition. These and many other claims are based upon conjecture, incomplete analysis and rumors. This multi-layered narrative may be simply the result of human desire for a big reason to explain a really big event. A narrative in which nineteen people planned September 11 without their grand story, but it is too complicated and has too many loose ends. Occam’s razor is needed to support their grand story, but it is too complicated and has too many loose ends. The official story is much simpler and requires no action by Occam’s razor. It is based upon principles of engineering, the knowledge of building construction and laws of physics. This explanation more easily explains the video and photographic evidence. I will look at just Tower 1, but the analysis applied equally well to Tower 2. The collapse of Tower 7 requires some additional analysis and is not addressed here.

The impact of the airplane on the north face of Tower 1 punctured the plains the video and photographic evidence. I will look at just Tower 1, ing construction and laws of physics. This explanation more easily ex-

razor. It is based upon principles of engineering, the knowledge of build-

The impact of the airplane on the north face of Tower 1 punctured the plains the video and photographic evidence. I will look at just Tower 1, ing construction and laws of physics. This explanation more easily ex-

Occam’s razor is needed to remove what is truly not needed. As the columns of the damaged stories failed, the mass of the building above begins to move down in free fall. When this mass hits the story below, the impact buckles those columns and the whole mass continues to move down, picking up additional mass with each story, representing inelastic impact. The principle of conservation of momentum would require a reduction in velocity with each impact is insignificant, so that the top portion of the structure appears to be in free fall. Conspiracy believers like to say that there has never been a case of col-

lapse of a multi-story steel framed building due to fire. That is simply not true. Buildings which did survive severe fires can be explained by the presence of fire resistant coverings on the steel frame. As each floor joins the collapsing mass from above, a massive debris field is created, which continues to move downward, buckling story after story. The air space within each story is compressed rapidly causing the air to be pushed out laterally and probably also down the elevator shafts. The rush of air carries with it concrete dust (from the ground up floor slabs), shredded furniture, paper and even Venetian blinds outward later-

ally. In addition, pieces of beams and columns are swirling around in this debris field, bumping into each other. These collisions will propel some of this steel laterally outward. It is this effect that the conspiracy theorists attribute to explosions.

In conclusion, the principle of engineering and physics are all that is needed to understand the collapse of the Twin Towers. There is no need to hypothesize explosive charges causing a controlled collapse and the narrative that surrounds that hypothesis.

ANONYMOUS PROFESSOR’S QUANDRY

Problem: Expand \((a + b)^n\)

Student Solution:

\[
(a + b)^n = (a + b)^n
\]

\[
= (a + b)^n
\]

\[
= (a + b)^n
\]

etc.
In an effort to increase awareness of Lake Merced, San Francisco’s back up water supply source, the Parks Service, SF Arts Commission and the Natural Areas Program has decided to collaborate with international installment artist John K. Melvin. The installment entitled “Over Merced” will consist of some 3600 one-meter in diameter white balloons tethered together in the shape of a free floating cloud, hanging over the north end of Lake Merced. The structure, as specified J.K. Melvin, will have a dynamic interaction with weather, blowing in the wind and fog and casting reflections in the lake below. The project speaks of molecular density, climatology affects and more notably, multiplicity. The collection of individual balloons functioning as a whole is a reference to sociology.

The Engineering Design Center as SFSU has been given the task of making one man’s vision a reality. The structure will be tethered to four neighboring trees with poly-propylene webbing spanning thousands of feet, and will be suspended four meters above the lake. The balloons themselves will weigh almost 300 pounds and generate close to 10,000 pounds of drag force in a strong wind. A rigging system must be designed to tolerate such loading, yet be fluid enough to allow movement. A catenary effect will be induced in the lines and the placement of each line must be exactly specified. More significantly, the installment can have NO environmental impact.

The actual installation itself will take place mid-August over the span of three days. New inflation as well as tethering techniques will have to be researched and implemented in order to save time and headaches. An industrial compressor capable of 400 cubic feet per minute will be utilized in an effort to save time as well.

This project represents a great opportunity of the EDC at SFSU to generate publicity for the school, Lake Merced and J. K. Melvin as well as 14,000 plus dollars for future EDC projects.
COMPETITION REQUIREMENTS:

- Students must have a declared major in the College of Science & Engineering (COSE)
- Projects must be related to one of the fields in COSE
- Projects entered in a previous year may not be in the competition
- Students must register by emailing Lannie the following information by Friday, April 25:
  - title of the project
  - all team members’ names and emails
  - faculty advisor’s name and email
  - department/concentration
  - graduate or undergraduate level
  - a BRIEF description of the project (an abstract)
- Students must set up their station by 1 pm on May 9
  (They may leave the premise or walk around to look at other projects from 1-3)

We also welcome ‘display only’ posters at the Showcase

Contact Lannie Nguyen-Tang for more details!

HOW TO MAKE A GREAT POSTER WORKSHOP

Thursday, March 20, 1-2 pm, TH 429

2008 SPONSORS

Dr. Kenneth & Dr. Pamela F O N G