



The California Tech

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A. Green/The California Tech

Caltech President David Baltimore, Vice Provost David Goodstein, Professor Janet Hering, and JPL scientist Ashwin Vasavada listen as an audience member asks the panel a question.

National Science Policy Explored By Panel of Research Advocates

By DAVID CHEN

Four Caltech-affiliated scientists discussed how public policy is impeding scientists, when scientific knowledge should be an important source of information for decision-makers. The format consisted of four speakers presenting a topic along with a question-answer session. In addition, a question section for the entire panel followed the four speakers.

President David Baltimore began by noting that "a remarkable breakdown" has occurred since the end of World War II. That time period was a watershed when issues of national security transformed science. During that

time, politicians demanded the "most unbiased scientific advice" to guide them. President Baltimore notes that today, politics tend to trump science.

President Baltimore explained how national and international scientific meetings are distorted. Before appointing scientists for national advisory committees, scientists must demonstrate not only scientific knowledge but also pass a political test. He also explained that the White House currently chooses which scientists may attend various health conferences, even if other scientists were specifically invited by the World Health Organization.

President Baltimore also stated

that although biology and medicine are some of the world's greatest problems, the current administration has done very little to solve them. For example, the AIDS epidemic is now spreading, with 5 million new cases a year. With no successful vaccine on the horizon, President Baltimore explains that an "ABC" plan—which previously worked to reduce the AIDS virus in Thailand and Uganda—should be taught around the world. The plan promotes that people practice abstinence, be faithful with partners and use condoms. The problem is that condoms are associated with birth control, so this plan is hampered by religious groups in Washington. He notes that funding for programs that promote condom use have been redirected to programs that promote abstinence, especially to faith-based groups.

In addition, Dr. Baltimore notes

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Face the Nation Host Reminisces in Book

By SONIA TIKOO

Hundreds gathered in Beckman Auditorium Wednesday night to hear Bob Schieffer as he promoted the release of his new book, *Face the Nation: My Favorite Stories from the First 50 Years of the Award-Winning News Broadcast* as part of the Voices of Vision Lecture Series, which he penned in celebration of the show's golden anniversary.

Schieffer, the current host of the Sunday morning political commentary show *Face the Nation*, delivered a speech highlighting significant news stories and commentary ranging from the program's first airing November 7, 1954 featuring an interview with then-Senator Joseph McCarthy, whose Red Scare movement and referral to the nation's premier legislative body as a "lynch bee" helped lead to his censure by the U.S. Senate soon afterward and with that his political downfall.

Schieffer relayed anecdotes of the pioneering *Face the Nation* journalists through the Cold War era, including the show's ground-breaking and controversial June 1957 interview with Soviet Union Premier Nikita Khrushchev—the first time an interview with a Communist leader ever aired on American television. The interview received accolades from other governments worldwide, but back in the United States, the "furious" Eisenhower administration was already at work establishing that in the future, questions for Soviet leaders by U.S. journalists had to be submitted in advance to the U.S. State Department for review.

Another important *Face the Nation* achievement was the day the show's producers conducted an interview with Fidel Castro the

day he overthrew Batista in Cuba, all the while being held at gunpoint by a large group of Castro's armed guards while the new ruler assured the world that he was "not a Communist" and that he would "never allow a dictatorship like the Batista imposed on Cuba."

Schieffer also mentioned the effect of the television revolution of the 1960's and detailed John F. Kennedy's mastery of this new media form to capture the hearts of the American people during his successful 1960 campaign for the U.S. presidency.

After discussing the many



K. Peng/The California Tech

Bob Schieffer responds to questions during an exclusive Tech interview.

exploits of *Face the Nation's* 50 years on the air, Schieffer switched to describing changes in the American political system over the years, such as the emergence of negative attack ads, the caliber of political candidates and the primary election system in relation to the national conventions.

He also included several per-

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Collins Clears Debate On Economy Growth

By ALEX SIEGEL

Chances are you want the economy to be doing well. Perhaps you've heard conflicting opinions from one or both of the candidates running for President. Last Thursday, in Baxter Hall as part of the Social Activism Speaker Series, Chuck Collins, co-founder of the non-partisan organization United for a Fair Economy, stopped by and settled the matter, once and for all.

He began by asking for five volunteers. Each volunteer was to represent one fifth of the United States, divided by annual income. The volunteer representing the lowest income level was instructed to take a meager half step forward to denote their small, 3% increase in Real Income since 1979. Most of the other volunteers took a few steps forward, except for the last volunteer, the wealthiest 20%, who ran out of floor space and began climbing the stairs towards the exit of Baxter Hall. The top 1% of the U.S. would have left the Lecture Hall altogether.

In the thirty or so years after World War II every member of

society, regardless of their income bracket, saw their wealth double. In the time since then, the wealthiest Americans have grown wealthier while the rest of the United States has not. Collins remarks that first "we grew together" and then "we grew apart."

According to Collins, the economy is doing great, as long as you are one of the wealthiest Americans. For most Americans, despite the reasonable inflation and stock values, the economy is just not finding its way into their income. This is creating a swiftly growing gap between the rich and poor. According to Collins, this wealth gap, although often overlooked, is "one of the single most important trends" in the economy.

Collins went on to demonstrate exactly how large a wealth gap exists in the United States, today. Ten new volunteers were selected, each representing one tenth of America based on income. This time, ten chairs were brought out each representing about one tenth of the wealth of the United States. Each volunteer got their

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Caltech Soccer Falls to Whittier



A. Green/The California Tech

Tim Tirrell is narrowly beaten to the ball by the Whittier goal keeper as Caltech suffers a disappointing 4-1 loss in an exciting home match.

Water Conservation, Stem Cell Research Touched on by Panel

Continued from Page 1, Column 3

that research in stem cells is crucial, but such research has been hampered by various groups. Such stem cells can be acquired from in-vitro fertilization or nuclear transfer to an egg. While adult stem cells can be useful, they are no substitute for embryonic stem cells. Dr. Baltimore emphasized that only with research can we understand the full potential of embryonic stem cells.

During the question-answer session, President Baltimore fielded numerous questions from the audience. President Baltimore was asked whether his statements that night would affect his credibility in Washington. He explained, "I had to think long and hard before making some of the statements. I felt that was the most important responsibility I had."

Audience members also asked about other plans. Dr. Baltimore noted that if Proposition 71 passes in California, the state could become a leader in embryonic stem-cell research and Pasadena could become the new bio-tech capital. In regards to national policy, President Baltimore stated that even if the current administration stays in power, the scientific community would continue doing their best to communicate with the administration.

Professor David Goodstein talked about the depletion of oil and how humans have not adapted quickly enough to prepare for the end of oil. Professor Goodstein introduced the dilemma by giving a condensed version of his talk from October 13. Essentially, global drilling for oil has been outpacing new discoveries for oil, following the same pattern that happened in the United States, where oil discovery peaked in the 1970s. Dr. Goodstein predicts the global peak in oil will occur soon and that as soon as we hit this peak, we will be in trouble.

"The crisis will come at the peak, not with the last drop of oil," explains Professor Goodstein. He shows the importance of oil in many uses such as petrochemicals, power plants, home heating and transportation. Furthermore, we lack feasible alternatives. Coal and natural gas, for example, could possibly lengthen the time we have, but they are also fossil fuels with limited supply. Professor Goodstein's key message that night was that while we currently lack workable alternatives, we should be able to research new innovations.

"We need to do research. I want to challenge you all to solve this problem, the same way that John F. Kennedy challenged us to put a man on the moon." Professor Goodstein noted that virtually no politicians have expressed concern over this problem, except for Hillary Clinton who sent a letter a couple weeks ago.

While there are many potential ideas to solve this problem, Dr. Goodstein believes the long-term solution will be nuclear fusion. With one gallon of water, nuclear fusion could produce the equivalent energy of more than hundred gallons of oil. In addition, the "waste" from this process would be nothing more than helium.

Professor Janet Hering discussed the issues of water supply and the degradation of the quality of water. She introduced the subject by noting that an average person requires 50 liters per day—about 18 cubic meters per person per year—for drinking,

cooking, sanitation, etc. However, she clarified that a society actually needs about 1300 cubic meters per person per year to account for agriculture and food production. Thus, the supply of water is extremely important.

Professor Hering noted that current funding and regulations hamper correct water usage. For example, the EPA's Clean Water state-revolving fund decreased from \$1.34 billion in fiscal year 2004 to \$850 million for fiscal year 2005. In addition, current rules may discourage users from conserving. For example, farmers may be reluctant to lower their water usage or they may lose their agricultural tax breaks.

To solve these problems, Professor Hering advocates a shift to distributed water management, a much more efficient system compared to the current centralized system. The new plan would have each residence care for its water supply. Instead of pumping waste water back to the city, the unit would check the water and route it to a proper use. For example, water that is clean but un-drinkable could be used for irrigation.

An audience member asked about the importance of water resources to nations and gave the importance of the Nile River to Egypt—who has stated its willingness to defend this resource—as an example. Hering clarified that while water is an important resource, most of a country's usage is for food production and various countries have decided to solve this problem in different manners. Israel, for example, imports the vast majority of its food. In addition, China has decided that it will allocate enough resources to produce sufficient vegetarian foodstuffs to feed its population, but meat will be imported.

Another important issue that was brought up was the ephemeral attitude most people take towards such long-term issues. Hering agreed, "It comes down to education. What is the long-term impact? Most people don't understand where it comes from when they turn their tap on."

Dr. Ashwin Vasavada, a JPL scientist who has studied global climate change and assisted US Representative Vernon Ehlers with science policy, discussed the issue of global warming. Scientists have conclusively shown that the global temperature has risen by about .6 degrees centigrade over the past century, leading to increases in sea level and decreases in global snow cover. The controversy, however, is whether we should do anything in response to these changes.

The Bush administration's current argument is that the Earth's climate has natural variability and scientists are not sure whether humans are responsible for the recent changes. In addition, changes to current regulations may lead to economic repercussions.

There have been attempts over the past decade to reduce global emissions. In the Rio Convention of 1992, nations agreed to reduce emissions to 1990 levels by the year 2000. Unfortunately, the agreements were non-binding and not much resulted. Thus, during the Kyoto Protocol of 1997, 38 developed countries bindingly agreed to reduce emissions to lower than 1990 levels by the years 2008-2012. This treaty was later rejected by the United States because the treaty's oppo-

nents argued that US companies were unfairly hampered in the global market.

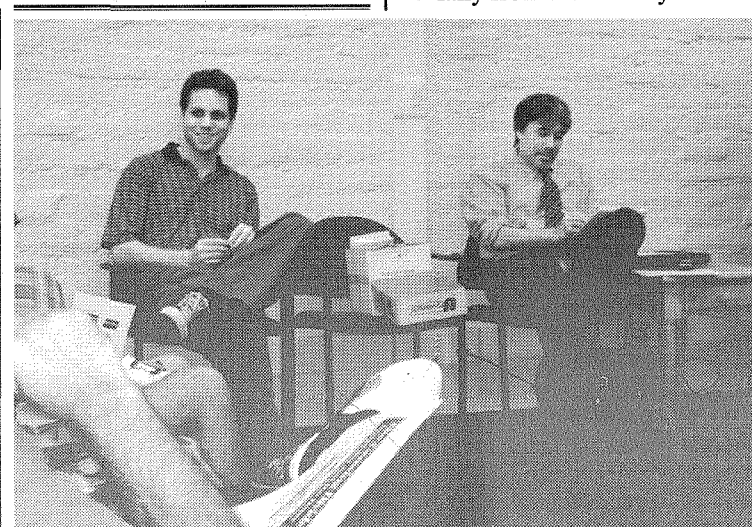
After numerous reports concluding that warming over the past 50 years have been caused by humans, the Bush administration decided to adopt a new measure. The US Global Change Initiative plans to reduce carbon emissions relative to GDP growth. There is a voluntary target of an 18% reduction in "emissions intensity" over the next 10 years.

Dr. Vasavada noted, "The sad truth is that we've already delayed too long, so we have to think about adaptation and mitigation." He noted, however, that federal R&D spending was at record levels, although most funding increases have gone towards toward defense and health research.

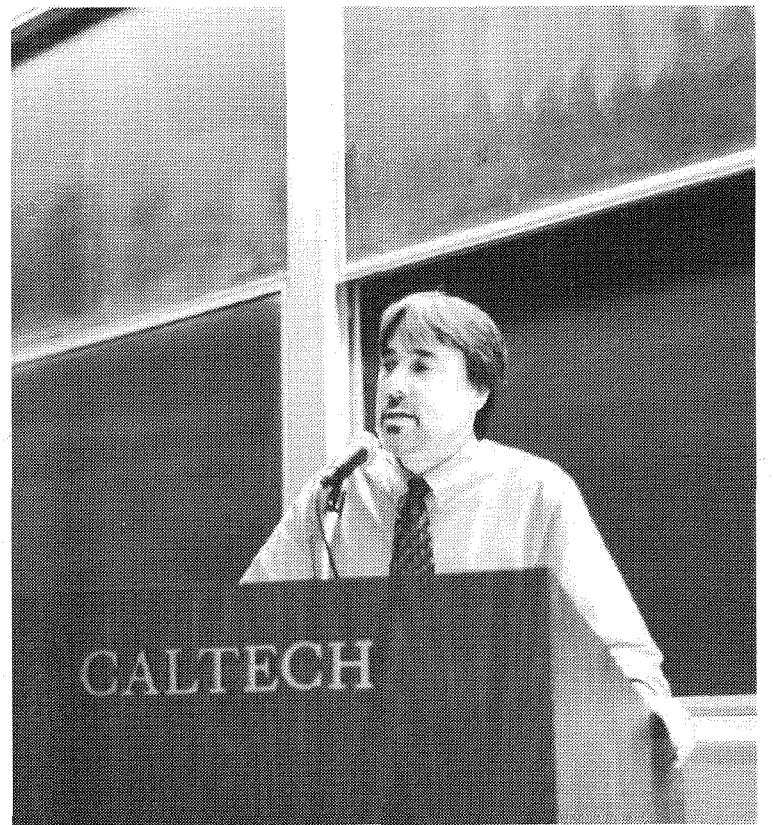
During the open panel, other policy issues related to science were brought up by audience members. One member stated concern at the current administration's plan to develop new nuclear weapons such as bunker busters and the lack of global concern at nuclear arms proliferation. President Baltimore explained that nuclear policy used to be very important issues "and 30 years ago an enormous response would have been generated." Goodstein also explained, "Scientists are probably frustrated and think that they won't be listened to. Back when there was a soviet power, there always was a fear that the arms race would go out of control."

In addition, the forum's moderator, Rebecca Adler, asked the panel how we could encourage students to become interested in science, mathematics and engineering. Hering stated that children and students are naturally interested in these subjects, so the question is how we manage to make them lose this interest. President Baltimore explained, "We (Americans) have a culture of instant gratification. There are other cultures where this is not true and they turn out vastly many more engineers, who are willing to work for less money. This is a situation we don't know how to deal with." President Baltimore noted that the National Academy of Science is currently discussing the issue of ensuring that top science is done in the United States.

The panel, which was sponsored as part of the Social Activism Speakers' Series, ended after a little more than two hours' time of noteworthy points and discussion, with audience members feeling more knowledgeable, although a bit sore from sitting so long. President Baltimore, however, noted earlier that night, "Yankee fans are better off here."



Collins, right, takes a moment before his lecture to speak with students about his new book.



K. Peng/The California Tech

Chuck Collins uses volunteers to demonstrate how the gap between the rich and poor is growing.

Growing Wealth Gap 'Bad for the Economy'

Continued from Page 1, Column 2

own seat, but not for long. The volunteer sitting at the far left, representing the wealthiest 10% of the U.S., spread out across seven chairs. Collins also added that the volunteer's arm, spanning the first four chairs, could represent the wealthiest 1% of America. The other nine volunteers did not look pleased to be crammed together on the last three chairs. The wealth gap is truly large if the wealthiest 1% of society has more wealth than the bottom 90% combined.

Some people argue that we shouldn't worry about the wealth gap as long as the poorest members of society have enough wealth to survive. Collins, however, feels strongly that the wealth gap is "bad for the economy, it's bad for government and it's bad for culture." When one group of people has so much wealth, it creates economic instability and limits economic growth. That same group also has an unfair advantage in politics by contributing so much wealth to political campaigns that democracy itself seems undercut. Culturally, the wealth gap creates new social barriers that could eventually divide the nation.

Collins brought up Brazil as an example of a country with a huge wealth gap. The few wealthy citizens rarely leave the gated communities in which they live, while the rest of society lives in a completely different country, cut off economically, politically and socially from the wealthy. Collins

adds that if our policies are not altered, the United States could end up like this in the near future.

Chuck Collins co-authored the book, along with Felice Yeskel and United for a Fair Economy, *Economic Apartheid in America*. In the book, he brings up vast amounts of evidence demonstrating the swift growth of economic inequality, how it came to be and what can be done to shrink it. The book illustrates that corporations account for fifty-one of the top one hundred economies, while countries only account for forty-nine. That the average CEO is paid 513 times as much as the average laborer working for them, while twenty years ago, they were only paid about forty-two times the laborers salary. There are many others, but I don't want to spoil the surprises.

The wealth gap is big and continues to grow bigger everyday. The upper-class experiences prosperity, while everyone else is left in stagnation. The economy may appear to be growing, but we must not be fooled by some of the economic indicators such as the stock market and inflation. With the wealth gap as big as it is, a growing economy doesn't necessarily mean that the economy is growing for you.

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courtesy of www.donut.caltech.edu
Sisters Elisabeth (above) and Rebecca Streit are this week's Co-Athletes of the Week for their huge contributions to the Women's Volleyball Team as Outside Hitters.



Cross-Country Places 6th, VB Breaks Losing Streak

By MIKE RUPP

Caltech Athletics Weekly Roundup

Women's Volleyball breaks losing streak against LPC

Breaking their nine-match losing streak, the Caltech Women's Volleyball team swept Life Pacific College, 3-0 (30-18, 30-14, 30-11) this past Tuesday at the Braun Gym.

The team was led by the Streit sisters, Sophomore Outside Hitters Rebecca and Elizabeth Streit, who won Caltech Co-Athlete of the Week Honors. (See below for a full description.)

Leading the team in kills was Senior Kristen Zortman, who had arguably her best match of the season with nine kills and a .444 hitting percentage, both team highs. For the season, Zortman leads the team in hitting percentage, and is third on the team in kills.

Freshman Setter Sarah Stidham had 23 assists and four service aces, and Senior Defensive Specialists Hesper Rego and Vi Tran had 13 and 11 digs apiece. Tran also chipped in eight service aces, as Caltech ran off a season-high 33 aces.

For the season, Rebecca Streit leads the team in kills, followed by Senior Delia Davies, Zortman, and Elizabeth Streit.

The team plays its next match against West Coast Baptist College this Tuesday night at home in the Braun Gym. The match begins at 5:00 PM.

Co-Athletes of the Week: Women's Volleyball's Elisabeth & Rebecca Streit

The twin 5-8 Outside Hitters from Jupiter, Florida teamed up this past week to break Caltech's losing streak, leading the team past Life Pacific College in three straight games.

Elisabeth's line included a team-high ten service aces, seven kills and seven digs. Rebecca recorded eight kills, nine service aces and four digs. The stat lines added up to 17 volleyball points for each woman, accounting for 54% of Caltech's total production.

For the season, Rebecca has lead the team in kills, while Elisabeth currently leads the team in service aces and digs.

The Streits hope to start a winning streak for Caltech starting this Tuesday when the team hosts West Coast Baptist College.

Women's Volleyball breaks

losing streak against Life Pacific College

Men's Soccer loses to La Verne, Cal Lutheran

The Men's Soccer team suffered two tough losses this past week, losing to La Verne by a final score of 7-1 on Wednesday, and following it up with a 10-0 drubbing at the hands of Cal Lutheran.

Sophomore Forward Sanjeeb Bose scored his second goal of the season to put Caltech ahead 1-0 just two and a half minutes into the La Verne match. But La Verne responded with seven straight goals, thus ending Caltech's bid for an upset.

Freshman Goalkeeper Elliott Pallett had 11 saves between the two matches, averaging 5.5 saves a contest.

The team plays its next match this Wednesday at home against Whittier College. Caltech defeated Whittier 1-0 earlier this season. The match starts at 4:00 PM.

Cross-Country teams place 6th at SCIAC Multi-Duals

The Men's and Women's Cross-Country teams both finished in sixth place at the SCIAC Multi-Duals on Friday.

For the Men, Freshman David Rosen was the top finisher for Caltech, finishing in 17th place with a time of 28:10.90. Junior Gustavo Olm, Track and Field's MVP from last season, finished in 38th place with a time of 29:32.90. Freshman Matt Kiesz, who was Caltech's #2 runner in most of this season's meets, finished 44th with a time of 29:42.30. On an encouraging note for Caltech, of the team's top nine finishers, all are expected to return next season, and Olm is the only runner on the group not in his Freshman or Sophomore year.

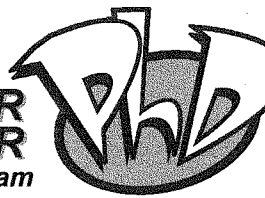
On the Women's side, Senior Kamalah Chang was the top finisher for Caltech, finishing in 26th place with a time of 26:09.10. Freshman Krastina Petrova finished in 31st place with a time of 26:43.20. Right behind her in 32nd place was Junior Ekua Anane-Fenin with a time 26:44.60.

Both teams finish with 2-5 conference records, with the Men beating out Whittier and Cal Lutheran, and the Women finishing ahead of Whittier and La Verne.

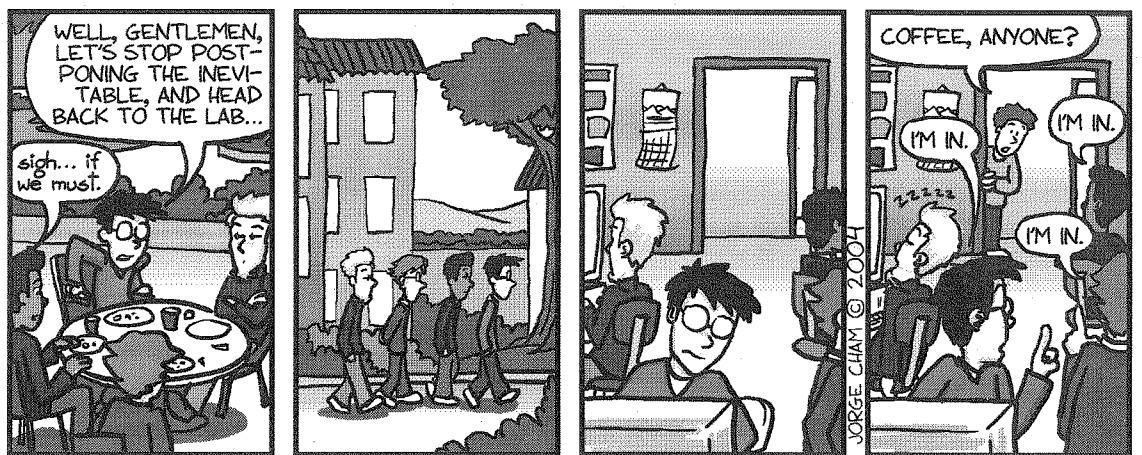
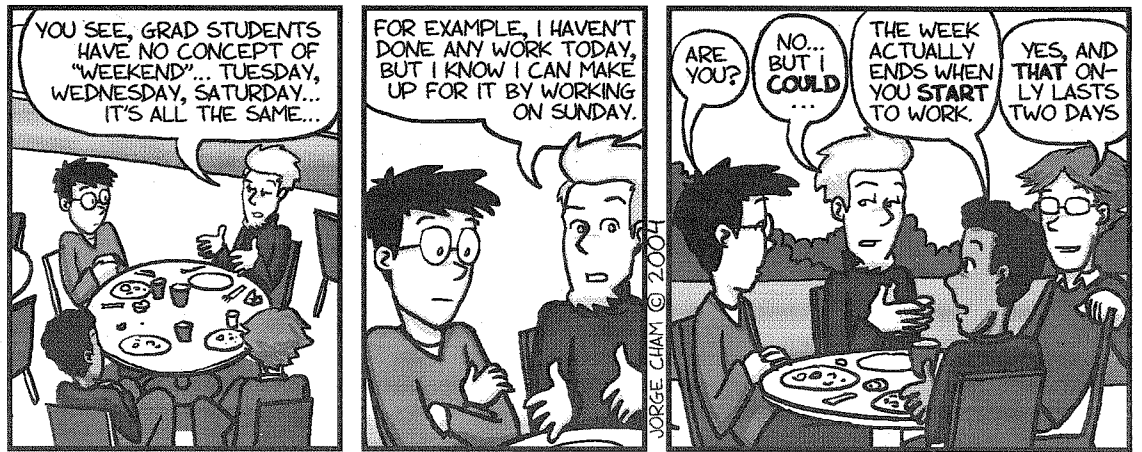
The teams run next October 30th at Conference Championships.

PILED HIGHER AND DEEPER

by Jorge Cham



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Representatives from CIA's analytical arm, the Directorate of Intelligence, will be interviewing for analyst positions in Los Angeles during the week of January 17th. Analysts work on the forefront of protecting national security, quickly assessing how rapidly changing international developments will impact US interests at home and abroad. They use information from classified and unclassified sources from around the world to develop and provide the reliable intelligence that is essential for US policymakers to make informed decisions. The DI is hiring for the following positions:

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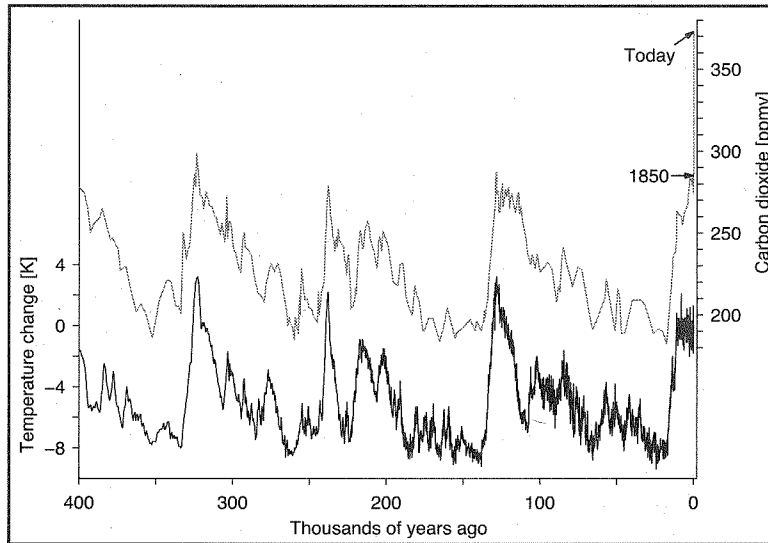
Global Climate Change: Addressing the Problem of Global Warming

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proaches that reduce the risk of the irreversible consequences by adapting sequentially as new information becomes available. For climate change abatement, a sequential decision making approach (or, in the parlance of engineers, a 'dynamic control approach') means to implement policies that lead early to a, perhaps modest, reduction of greenhouse gas emissions and to adapt as we obtain more information about the climate system and as we gain experience about the effectiveness of the policies. Early reductions in emissions would leave future generations with a wider range of achievable stabilized greenhouse gas concentrations and lead to immediate ancillary benefits, such as cleaner air and a reduction of our dependence on foreign oil. Market incentives for reductions of greenhouse gas emissions would spur innovation of low-emission technologies and would also allow the institutions that are necessary to guarantee a fair global market for tradable emission allowances to grow and evolve gradually.

The Kyoto Protocol (1997) to the Framework Convention on Climate Change is a first step toward achieving modest emission reductions. It specifies binding emission targets according to which, by the period 2008-2012, industrialized countries will reduce their collective emissions of greenhouse gases by 5.2% compared to the year 1990. The national emission targets for Europe and the U.S. are 8% and 7%. In a limited trading system, countries that do not meet their targets by emission reductions can purchase surplus emission allowances from industrialized countries that reduce their emissions more than they are required. The Protocol also provides additional mechanisms through which industrialized countries can receive credit toward greenhouse gas emissions, for example, by promoting emission reductions in developing countries.

The Kyoto Protocol was immediately criticized for a number of shortcomings that made its ratification by the U.S. Congress unlikely. For example, developing countries are exempt from the binding targets of the Kyoto Protocol, reflecting the international consensus that industrialized countries should take the lead in reducing greenhouse gas emissions because most of the greenhouse gas emissions that have accumulated in the atmosphere so far are from industrialized countries and per capita emissions in the industrialized countries far exceed those in developing countries. In 1997, the U.S. Senate voted 95-0 for a resolution against the U.S. ratifying any treaty that exempts developing countries, arguing that their emissions may exceed those of the industrialized countries by the year 2015. More fundamentally, economists criticized the cap-and-trade mechanism of the Kyoto Protocol because it set ad hoc emission caps. The emission caps entailed a risk that the emission reductions may become excessively costly for countries such as the U.S., which experienced significant economic growth accompanied by increases of greenhouse gas emissions in the 1990s, after the baseline year for the Kyoto emission targets. Many economists prefer more flexible trading systems, which might, for example, cap the prices of emission allowances, rather than their quantities, thus reducing the uncertainty about the costs of emission reductions.



Data from Petit et al. 1999, and Keeling and Whorf 2004
Temperature variations (black, left axis) and carbon dioxide concentrations (gray, right axis) inferred from an Antarctic ice core. The 100,000-yr ice age cycle is clearly recognizable. Carbon dioxide concentrations today are higher than they were at any time in at least the past 400,000 years.

The Kyoto protocol can only be understood as a small first step toward addressing the problems of climate change. It is clear that its terms and likely even its fundamental policy instruments will need to be renegotiated, for example, when the emissions from countries such as China, which is currently exempt from the binding Kyoto targets, increase.

Enter George W. Bush. In his election campaign in 2000, President Bush promised to "establish mandatory reduction targets" for carbon dioxide, contrasting his pledge with that of Vice President Gore, who was advocating only voluntary reductions. In March 2001, writing in a letter to Republican Senators, Bush stated that he opposes the Kyoto Protocol and, reversing his position, that he does not believe "the government should impose on power plants [which produce about 40% of the U.S. carbon dioxide emissions] mandatory emissions reductions for carbon dioxide." Referring to a Department of Energy study that predicted increased electricity prices and shifts from coal use to natural gas use in power plants if carbon dioxide emission caps were introduced, he reasoned that, "At a time when California has already experienced energy shortages, and other Western states are worried about price and availability of energy this summer, we must be very careful not to take actions that could harm consumers. This is especially true given the incomplete state of scientific knowledge of the causes of, and solutions to, global climate change."

Citizens in the U.S. and foreign governments were angered and the Environmental Protection Agency Administrator Whitman, who just days before, according to a memo published in the New York Times last week, had urged the Administration "that global warming is an issue that must be addressed," was publicly embarrassed for her support of Bush's campaign pledge. March 2001 newspaper headlines called it "Bush's foolish flip-flop" (Denver Post) and the "Global flip-flop" (Boston Globe).

The California energy crisis soon disappeared as a justification for abandoning strategies to reduce greenhouse house gas emissions, if it ever did provide a justification. After all, no one on either side had suggested sudden changes in energy supply or pricing. Bush's comment about the "incomplete state of scientific knowledge" - despite the comprehensive IPCC report published earlier - led to public outcry, and so he commissioned the National Academy of Sciences (NAS) to evaluate the state of scientific knowledge about climate change.

The NAS report was published in June 2001 and reaffirmed the conclusions of the IPCC report. The NAS report began: "Greenhouse gases are accumulating in the Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed in the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes is also a reflection of natural variability."

This left the Bush Administration unable legitimately to justify a wait-and-see approach to global climate change based on scientific uncertainty. Scientific uncertainties point toward early action to hedge our bets about climate change, for the risk of climate change having an adverse effect on the well-being of at least part of the world's population is clearly greater than zero. Adopting a wait-and-see approach posits certainty that future generations will be able to cope with climate change where, in fact, uncertainty about the extent of expected climate changes prevails.

But the NAS report did not sway the Bush Administration. The Administration has rejected the Kyoto Protocol but has not proposed an alternative. In 2002, Bush proposed to reduce the greenhouse gas intensity (ratio of greenhouse gas emission per unit economic output) by 18% by the year 2012, which would allow U.S. greenhouse gas emissions to grow by about 12% over 2002 levels or 30% over 1990 levels. This is a very modest goal at best. It would represent a slight improvement over the Administration's business-as-usual projections, but the intensity reduction merely continues long-term trends: according to Department of Energy data, the U.S. greenhouse gas intensity decreased by 21.4% (or by an average of 2% per year) between 1990 and 2002, in part because of the declining share in economic output of the emission-intensive manufacturing sector. The planned additional reduction is to be achieved by voluntary measures; no mechanism was established for ensuring that the target will be met.

When Science Magazine asked President Bush and Senator Kerry this summer to answer questions about their views on science, Bush selectively quoted from the NAS report from June 2001 to emphasize uncertainties about the science of climate change. In answer to the questions, "Is human activity increasing global temperatures? If so, should the United States set specific goals with respect to limiting or reducing greenhouse gas emissions by the end of the decade?", Bush wrote that "key uncertainties remain concerning the underlying causes and nature of climate change." To bolster his case, he quoted from the NAS report: "Because there is considerable uncertainty in current understanding of how the climate system varies naturally and reacts to emissions of greenhouse gases and aerosols, current estimates of the magnitude of future warming should be regarded as tentative and subject to future adjustments upward or downward. ... Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of the various forcing agents (and particularly aerosols), a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be unequivocally established." The selective quotation omits passages warning of the risks of climate change. For example, the sentence in the NAS report immediately preceding the sentence above quoted by Bush reads, "National policy decisions made now and in the longer-term future will influence the damage suffered by vulnerable human populations and ecosystems later in this century." In context, it is clear that the NAS wishes to convey that global climate change poses significant risks, uncertainties about the magnitude of future climate changes notwithstanding.

In the Science questionnaire, Bush went on to describe the goal to reduce greenhouse gas intensity and various climate change science and technology programs. He did not provide a response to Science's question whether he is in favor of a cap-and-trade program for greenhouse gas emissions.

In response to the same questions, Kerry provided few details. "The scientific evidence is clear that global warming is already happening and rising levels of global warming pollution are making the problem worse. ... President Bush rejected the Kyoto Protocol, stubbornly walking away from the negotiating table altogether and eroding our relations with global allies. John Edwards and I will take the United States back to the negotiating table. ... As [we] work to rejoin the international community on global warming, we will work at home to take concrete steps to reduce greenhouse gas emissions. ... John Edwards and I support a similar approach [to cap-and-trade systems] to global warming, setting concrete limits to reverse the growth in global warming pollution but letting industry find the best path for getting there." One would like to see a more concrete proposal.

Devising global warming policies is a challenge that requires courageous leadership and a willingness to confront both the socio-economic and the scientific risks and uncertainties, without positing certainty about either costs of emission reductions or risks of climate change where uncertainty reigns.

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Opposing Thoughts to 'Strategic' View On a Lighter Note: Weather

Continued from Page 5

Afghanistan

Afghanistan was the appropriate military target because it was a state defiantly protecting the group unquestionably guilty of 9/11. The use of force against a state that had clearly committed international transgressions sent the correct message that America was, with rational and legitimate cause, striking at terrorist groups and not Muslim peoples. Even the Pakistanis, who had propped up the Taliban, saw the necessity of our actions. Even Iran turned a blind eye to American troops operating at its borders.

It is absurd that our tactical flexibility was limited because Afghanistan is land-locked and surrounded by neighbors traditionally adverse to America troops. Our global airlift capabilities are the envy of the world and quite capable of achieving any such military objective.

In addition, Afghanistan is far from the peripheries of the struggle with terrorism. It is the perfect proving ground for our mission to stabilize and democratize a country previously wracked by Islamic extremism. Since much of Afghanistan's current state originated from the Cold War, a prosperous Afghanistan would be a great testament to America's constructive power. True, none of the 9/11 terrorists were Afghani, but neither were any Iraqi. Afghanistan may not hold ideological significance (although it was enough to motivate thousands of mujahadeen to fight the Soviets). But, are we seriously considering invading Saudi Arabia as the proposed line of logic would lead us to?

In short, the progress of Afghanistan and our demonstrated commitment to rebuilding that nation is another essential barometer of combating terrorism.

Neutralizing Terrorists

There is an important subtlety lost in the clamor about 9/11 and Iraqi intelligence failures: We knew beforehand about Osama Bin Laden, Al Qaeda, and all the terrorist networks that attacked us! What was underestimated was their capability to strike. Most terrorist networks around the world - with the exception of groups in tumultuous areas such as Iraq - are well known by respective internal security forces, law enforcement offices, and intelligence agencies. Hence, the short term anti-terrorist objectives should be to pressure and support as many nations to act against terrorism simultaneously - in essentially a muscular form of law enforcement: arresting and interrogating leaders of organizations; freezing financial assets; interdicting arms shipments. Military action may be a necessary escalation of policing, but only if the tactical and strategic benefits outweigh the inherent destabilizing nature.

Most egregious is the notion that attacking and holding a place of ideological value to "draw out the terrorists" is a constructive strategy against terrorism. Terrorist are not a static pool of individuals. Military actions and the inevitable casualties - especially when the military action is indefensible - confirms ideological hatred and serve to create terrorists where there were originally none. Were any of the 9-11 hijackers (or significant players of Al Qaeda for that matter) Iraqi? Yet today it

is evident that thousands of Iraqis are now our sworn enemies. No matter how many terrorists we neutralize through military action, we can still lose the struggle by breeding enough terrorists to replenish their ranks. As students well schooled in differential equations, we must surely appreciate this mathematical certainty.

In any case, it is to our cause's advantage to devoid the conflict of ideological justifications - Christians vs. Muslims, Islam v. the West - and frame in the less passionate but more objective context - eliminating radical extra-state groups which threaten national and international security. Intentionally targeting ideological centers gives credence to demagogues who would love to see this conflict expand to a clash of civilizations.

Our policies must be measured in a rough sense by how many terrorists are we neutralizing vs. inspiring.

Kerry v. Bush

Having painted a contrasting framework, it is time to evaluate the candidates in relation to these metrics. Because elections serve as the only practical enforcement of the electoral mandate, a sitting

leverage to secure crucial international cooperation. It has given common cause and ideological tinder to scores of would be terrorists. It has hamstrung our ability to deal forcefully with Arab governments because of popular discontent. On the home front, the administration has not addressed our dependence on world oil. Domestic drilling cannot insulate us from global circumstances because market forces equilibrate fuel prices to world-wide supply. The only remedy is to address demand. Diplomatic and economic efforts to address poverty, inequity, political repression in the rest of the world have given way to gratuitous shipment of arms to every government claiming anti-terrorist cause with sparse review of how military force is applied without addressing systemic issues fueling armed insurrection.

Kerry's agenda to more actively engage the international community would strengthen our hand in pressuring for stronger action against terrorist organizations. The restraint necessary in multilateralism will be more than compensated by stronger cooperation - especially because our options are already severely constrained by military and logistical limitations.

It is unsurprising that neither candidate differs greatly on plans on how to move forward. Both candidates have expressed support for adopting intelligence reforms. As for Iraq, we have no serious alternative than to remain engaged until some semblance of order establishes itself. Although an articulated intention of a timely withdrawal is probably motivated by domestic political considerations, it may also serve to diffuse the charge of "imperialism" that plagues the perception of our mission among the Iraqis. Kerry is more willing and would be in a better position to change enacting this shift.

In both hot-spots, increased and more transparent execution of American funded reconstruction is also an urgent necessity. Concurrently, the training of an indigenous security force is required. Stabilizing forces and economic development are needed to prevent a relapse to extremism in Afghanistan. Both candidates promise this, so it falls upon consideration of their prior record to determine their likelihood to execute. Detailed analysis by "Catastrophic Success" (October 19th, 2004 New York Times) of administration actions in the early months of 2003 is available. It shows a Bush Administration's disturbing unwillingness to acknowledge the possibility of outcomes not consistent with their hopes for quick extraction from hot-spots and an inexcusable slowness to act.

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By HAMILTON FALK

So there are a lot of "political" issues going on right now, such as which presidential candidate is better, which one will win, who is richer, who should be the new Assistant Secretary of the Interior and other such heated election battles. Among the most important is how swing states are going to vote, either Republican or Democrat, and how third party candidates, last minute ads, the debates, and many other factors will influence this.

For some reason these topics are usually reported on by people who claim to include "facts" in their articles (as if facts have anything to do with politics). Of course I'm going to follow this tradition, and talk about something completely different. You didn't really think I was going to write an article breaking down the election, did you? I don't do small stuff like that; I stick to the important issues. Like the weather.

Normally I think we can all agree that Southern California has nice, if bland, weather including sunshine, no clouds, occasional earthquakes, and also sunshine. Normally this lack of rain and snow and other forms of interesting weather is easily explainable: earthquakes are very territorial, and will chase off any other forms of weather that come into their territory. This is obvious when one considers that Florida hasn't had any earthquakes, but several other weather events, like Hurricanes. Same thing is true for Maine, which has lots of weather, but none in the form of earthquakes.

But recently, something has gone out of whack, as is obvious because I clearly saw several times with my own eyes water falling from the sky (not the sprinklers). Now at first I assumed this was because the earthquakes had gone away, but apparently we've been having little ones recently (and the little ones defend their territory very aggressively) yet we've still had weather. So I did a little of what I like to call "research" but what most people would claim was just searching on Google. I found out that this year one of the few types of weather more powerful than earthquakes was coming by to rough us up a little bit with some rain and coldness.

That's right, El Nino is back, and try as they might, the earthquakes won't be able to drive it away. I looked into it's history, and found this quote from some scientist or something named Christopher Farley, "For those of you who don't 'habla Espanol', El Nino is Spanish for...The Nino!" Another source, Curtis Lum of the Honolulu Advertiser offered this tidbit, "El Nino for Hawaii usually means dry, unsettled weather in our winter time. So that will be quite a contrast to the past winter where it was quite wet"

I don't know why he said that, but it seemed important at the time. Another thing he mentioned that made me feel more comfortable was that "It's hard for one to sneak up on us now." This is because they are very large, and tend to make noise when they're trying to sneak. And because we've studied them with science and stuff. So now you understand what El Nino is, but I bet you're wondering "how does this affect me?" and "is it affect, or effect, I can never remember" and maybe even "does he think if he includes a quote from some Hawaiian newspaper we'll think his column is less of a waste of the time it took me to read this?" The answers are: a lot, in this case it's affect, and yes he does. The main things that will happen because of El Nino are rain, and it being cold. Unless you live in Hawaii, in which case it'll be dry. Same thing with the East Coast. Obviously the important thing you've learned from this article is that if you live in a "swing state" you should vote, and that while third parties are important, the first two are much more fun, and generally everyone is tired by the third one and it's just sitting around talking and eating chips and stuff. No, wait, the thing you've learned is that when someone asks about why the weather is how it is, you can sound classy and scientific if you tell them "El Nino." This may not actually be true in the specific case (It is rarely the reason for cold fronts on the East Coast for example. The reason for those is Canada.) but it nearly always sounds good. I could tell you more about reasons for weather phenomena, but that's not really my department.

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See www.hertzfoundation.org for more details.

Schieffer Recounts Historic Show Events: McCarthy, Kennedy, 9/11

Continued from Page 1, Column 5

sonal anecdotes relating to the development of his journalism career through a "series of accidents" and how his being sent to report from Vietnam for a newspaper led to his being hired by a local television station, after which he got his job at CBS because a secretary let him in for an interview without an appointment because she had confused him with another job-seeking journalist whose name also happened to be Bob.

Following his speech, Schieffer fielded questions from audience members, several of whom commented on Schieffer's moderating of the October 13 presidential debate between Senator John Kerry and President George W. Bush, some expressing their admiration for his performance, others criticizing the "Hallmark moment" brought forth when Schieffer asked the candidates what they learned from the strong women in their lives. Schieffer openly defended his debate questions and techniques and clarified the limitation imposed upon debate moderators as set by previous agreement between the candidates.

Schieffer also expressed his disappointment with the current national news media's frequent habit of fostering national political polarization by putting "extremists of one side against extremists of the other side" on the air and also with the unedited, often inaccurate nature of news

portrayed on the Internet, citing CBS's experience debunking online rumors of other hijacked planes-at-large and reassuring the public to prevent mass hysteria during the September 11, 2001 terrorist attack.

Nevertheless, Schieffer still believes "the American press is the best in the world," claiming "we still work hard and we still have some very good people, but yeah, I think it's as good as it used to be."

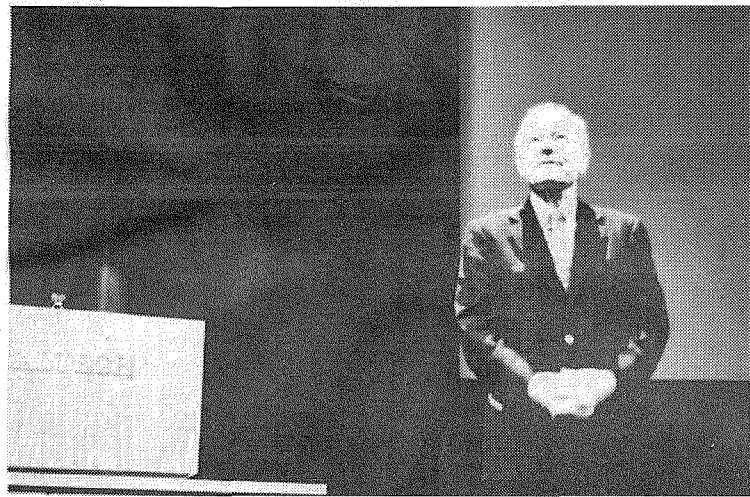
The *California Tech* also managed an exclusive interview with Schieffer in which he discussed more of his personal experiences as a journalist. When asked about his experience moderating his first presidential debate, Schieffer commented, "The stories that I'll never forget—I was in Dallas when Kennedy was assassinated, I went to Vietnam after that and then I was deeply involved in the 9/11 attack and those were very difficult stories. But from the standpoint of the intellectual challenge, this was the most interesting thing I've ever done. It was interesting in two ways—to try to come up with questions that would invoke answers that were beyond the talking points [...] some of the times I succeeded and some of the times I didn't but the times that I did were really when I asked the softer questions [...] those to me were the interesting questions."

Over 52 million people tuned into the October 13 debate, a gi-

gantastic turnout in comparison to years past. Schieffer claims the increased public interest in politics can be attributed to the fact that the debate system is "a part of the political process now that people can be proud of. Our campaigns are so sour and so nasty because they're so dominated by these negative campaign commercials. At last people's intelligence was not being insulted. [...] Even though I wish there would have been a better opportunity for me to ask follow up questions, they were still just terrific I thought and I think the debates are one reason so many young people registered to vote this year."

Schieffer began working at CBS in 1969 and is considered to be the most experienced Washington reporter in broadcast journalism today. He has served in his position of Chief White House Correspondent since 1982 and has covered every Democratic and Republican national convention since 1972 as a floor reporter. He has hosted *Face the Nation* since May 1991. The winner of multitudes of journalistic awards, in addition to six Emmy's, Schieffer has also penned several other books such as the 2003 New York Times best seller, *This Just In: What I Couldn't Tell You on TV*.

Face the Nation: My Favorite Stories from the First 50 Years of the Award-Winning News Broadcast is available from publisher Simon & Schuster for a list price of \$26.95.



K. Peng/The California Tech

Schieffer accepts the applause of the audience before his talk last Thursday in Beckman Auditorium.

Alumnus Returns To Offer Business Advice

By CHRISTINE CHANG

Few can live the American dream. Many dream of starting their own successful business, but most never reach this goal. However, Dr. Milton Chang, who recently received the Caltech Distinguished Alumni Award, has attained this aspiration and returned to advise students as to how to begin and run a successful business in the Avery Library on October 21.

"I remember not too long ago, I was also going to this kind of seminar, so I want to share the insights I have gained," said Chang. Before entering the business world, Chang graduated from Caltech with a Master and Ph.D. in Electrical Engineering. "What Caltech taught me was humility," Chang said.

While at Caltech, a professor inspired and made him interested in business. Therefore, when he found that he did not enjoy his research engineering job, he joined a startup company called Newport Corporation. Rising to become CEO of the company, he took Newport public in 1971. Presently, he works for Incubic, a venture capital fund which aids in the founding of technology companies. Furthermore, Chang has built two successful businesses from scratch.

"Technology is easy, but people are difficult," Chang said. He warns that building a company not only takes inspiration, but also vision and the ability to execute the ideas.

"It's not just about technology, it's about business, people, relationship and they all have to fit in a common sense way," he said.

In addition to working cooperatively and building trusting relationships with people, Chang cautions that time, above any other resource, needs to be used with care. "Money is a renewable resource while time is not," said Chang.

In making business decisions, he stressed the importance of having a broad base of knowledge from which to draw. Not only must a successful businessman know about business, but also about technology, current events and various other subjects.

"Once you learn to dig deep into a subject, you can dig deep into other subjects," he said.

Furthermore, clinging to ethics is vital to building a good company. When working in a business, one should always be professional, but must act with compassion. "It's like when parents want to be tough on children so they succeed," said Chang.

Contrary to popular belief that businessmen must lie and be secretive to gain success, Chang emphasizes the importance in be-

ing honest and straightforward, always ensuring that one's position is obvious.

In making decisions, leaders should also keep in mind the broader scope of events, instead of remaining focused on specifics. "It's about doing good for society, good for mankind, good for business," Chang said.

Company founders and presidents must not allow their self perception to be distorted, because this could lead to many mistakes through arrogance, says Chang.

In building a successful company from scratch, one should not focus on money, because this will lead to taking greater risks in order to gain more money.

"You should have a vision of reaching and searching for excellence. Focus on making a great company and the money will come. Always put the customer first," Chang said.

In addition, when hiring people to aid in developing the company, many make the mistake of choosing people like themselves. However, the group should be made of people with diverse, specific skills so that somebody can handle every functional area of the company.

When taking on the leadership position, one must fill many roles. However, Chang stresses the importance of certain responsibilities above others.

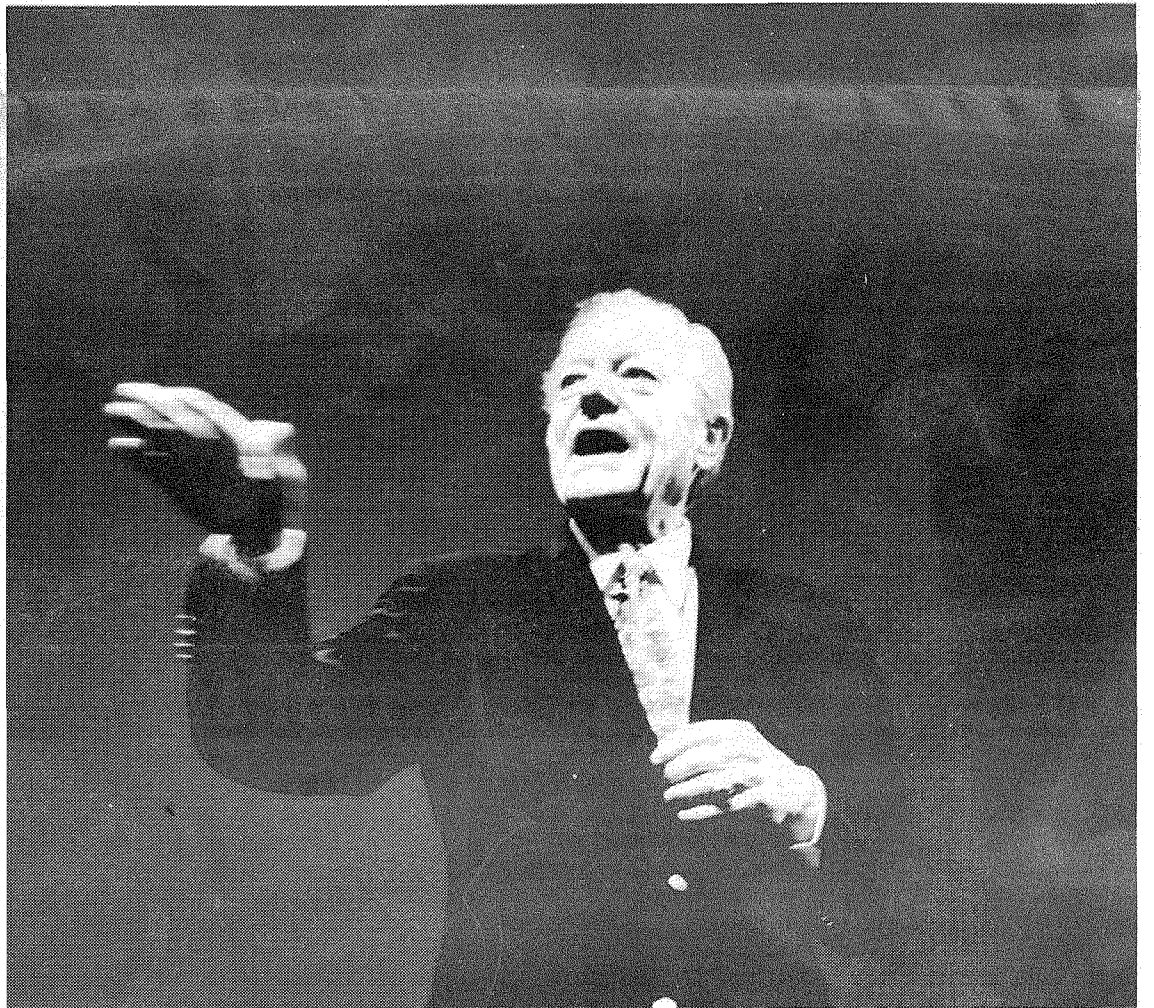
"When in doubt, always fall back on the cave man model in relationship issues. The leader protects," Chang said.

The work environment must be one which inspires employees to succeed and aids people in becoming self-actualized. To build this, Chang advises employers to give their employees many options and not to push the employees.

While developing a company appeals to many people, Chang warns that joining a startup company directly out of school might not be the optimal path for students to take. Before becoming part of a startup company, they should accumulate resources and knowledge by becoming part of a well-managed business, speaking with people, becoming exposed to more opportunities and building a good reputation. Furthermore, working in an established company will allow them to gain experience in working with difficult people.

When working, Chang stresses that one should not work for money, but for knowledge. Each job should be a learning experience.

Chang's seminar was sponsored by the Consulting Club and the Alumni Relations.



K. Peng/The California Tech

Bob Schieffer, host of CBS's *Face the Nation*, shares some of the accidents that led to the beginning of his career with CBS, starting as a local television anchor.

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