

Public Written Comments

Submitted to PCAST
September 11, 2014 - November 7, 2014

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Re: Alternative Drug against Ebola

From: "Kathy Han" [REDACTED]

Date: Sat, September 20, 2014 6:28 am

To: pcast@ostp.gov

Re: Alternative Drug against Ebola

Dear Sir,

Herpes Virus infection is done through endocytosis is an energy-using process by a cell absorb molecule (such as protein).

Ebola Virus to penetrate host is using viral pinocytosis, using the endocytosis such as Herpes.

If we sustain by alternative material against Herpes Virus infection, it can also be practice to Ebola virus.

I did it in case of Herpes Virus to sustain for three months against Herpes Virus, so that the alternative material shall be applied if Ebola.

This is not false.

EuneKyung Han

Re: Common between Herpes and Ebola

From: "Kathy Han" [REDACTED]

Date: Sun, September 21, 2014 12:47 am

To: "pcast" <pcast@ostp.gov>

On Sun, Sep 21, 2014 at 1:39 PM, Kathy Han [REDACTED] wrote:

So that I think I got the Alternative to enhance wall of epithelial and mucous membranes.

According to wikipedia, kittens born with Feline Herpes Virus cannot live because necrosis of respiratory mucous membranes, but my kittens very active until three months before I applied anti-biotic drug to them. And only saved a kitten, he is now very active and joyful cat.

And Herpes Viridae transmission into cell is endocytosis and Ebola is pynocytosis.

On Sun, Sep 21, 2014 at 1:29 PM, Kathy Han [REDACTED] wrote:

Re: endocytosis:

This image has been removed for security reasons.

The different types of endocytosis

<http://en.wikipedia.org/wiki/Endocytosis>

Ebola's pinocytosis:

This image has been removed for security reasons.

Pinocytosis, the form of endocytosis schematic that is used by the Ebola virus to gain entry to a host cell².

https://microbewiki.kenyon.edu/index.php/Ebola_Transmission

[Corrected]: PCAST's agenda, Economic science and Fwd: NYT "Europe's Anti-Semitism Comes Out of the

From: "Lloyd Etheredge" [REDACTED]
Date: Wed. September 24. 2014 2:14 pm
To: [REDACTED] [more](#)
Cc: [REDACTED] [more](#)

Dear PCAST Members, Associate Director Handelsman and Assistant Director Rubin:

Concerning urgent scientific challenges that I have brought to your attention, I forward a discussion of the predicted (and growing) trends from this morning's New York Times, "**Europe's Anti-Semitism Comes Out of the Shadows.**" You will observe the effects of economic causes, especially high youth unemployment.

I also enclose a reminder copy of "**Divisions Grow as a Downturn Rocks Europe**" (August 29) re the failure of economic science that now ought be at the very top of PCAST's attention for swift action and an urgent solution.

Governments are throwing trillions of dollars at this problem. In the past, it worked. Now, it does not.

-The Director of National Intelligence can arrange a full briefing for PCAST about scenarios and potential tipping points, which also include escalation of ethnic violence against Islamic youth and immigrants. In some cases, social media now are supporting contagion of hatred and fear. I believe that the DNI will support my earlier analysis that President Obama and PCAST do not have much time left.

PCAST's System Design Solution?

Nobody has the required intellectual leadership, funding, and mandate to build a rapid learning G-20 system for macroeconomics. The world now depends upon America - and, *de facto*, PCAST - for scientific leadership, system design solutions, and rapid learning macroeconomics. NSF remains unavailable.

- The new R&D data systems for Recovery Economics must be deployed cross-nationally, The coefficients in each nation that are, now, interpreted (by convention) as economic rational choice differ and are compounds with cultural, social, and personal emotion and other characteristics. These elements, and their separate pathways, need comparative data to be recognized and measured by scientific methods.

Lloyd Etheredge

Dr. Lloyd S. Etheredge - Project Director

Policy Sciences Center
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Bethesda, MD 20817-1204

URL: www.policyscience.net; [REDACTED]

Please reply to: [REDACTED]

[The Policy Sciences Center, Inc. is a public foundation that develops and integrates knowledge and practice to advance human dignity. It was founded by Harold Lasswell, Myres McDougal, and their associates in 1948 in New Haven, CT. Further information about the Policy Sciences Center and its projects, Society, and journal is available at www.policysciences.org.]

Europe's Anti-Semitism Comes Out of the Shadows

By JIM YARDLEY. NYTimes. SEPT. 23, 2014

SARCELLES, France — From the immigrant enclaves of the Parisian suburbs to the drizzly bureaucratic city of Brussels to the industrial heartland of Germany, Europe's old demon returned this summer. "Death to the Jews!" shouted protesters at pro-Palestinian rallies in Belgium and France. "Gas the Jews!" yelled marchers at a similar protest in Germany.

The ugly threats were surpassed by uglier violence. Four people were fatally shot in May at the Jewish Museum in Brussels. A Jewish-owned pharmacy in this Paris suburb was destroyed in July by youths protesting Israel's military campaign in Gaza. A synagogue in Wuppertal, Germany, was attacked with firebombs. A Swedish Jew was beaten with iron pipes. The list goes on.

The scattered attacks have raised alarm about how Europe is changing and whether it remains a safe place for Jews. An increasing number of Jews, if still relatively modest in total, are now migrating to Israel. Others describe "no go" zones in Muslim districts of many European cities where Jews dare not travel.

But there is also concern about what some see as an insidious "softer" anti-Jewish bias, which they fear is creeping into the European mainstream and undermining the postwar consensus to root out anti-Semitism. Now the question is whether a subtle societal shift is occurring that has made anti-Jewish remarks or behavior more acceptable.

"The fear is that now things are blatantly being said openly, and no one is batting an eyelid," said Jessica Frommer, 36, a secular Jew who works for a nonprofit organization in Brussels. "Modern Europe is based on stopping what happened in the Second World War. And now 70 years later, people standing near the European Parliament are shouting, 'Death to Jews!'"

This is not the Europe of 1938. French leaders have strongly condemned the violence. Chancellor Angela Merkel of Germany this month led a rally against anti-Semitism in Berlin at which she told Germans, "It is our national and civic duty to fight anti-Semitism."

Europe has seen protests and outbursts of anti-Semitism whenever the Israeli-Palestinian conflict has erupted, and some analysts say this summer's anger is a cyclical episode that like others will fade away. Some note that the number of reported anti-Semitic incidents this year in France, for instance, is well below some years in the 2000s.

Yet as European support for the Palestinian cause and criticism of Israel have hardened, many Jews describe a blurring of distinctions between being anti-Israel and being anti-Jew.

With Europe still shaking from a populist backlash against fiscal austerity, some Jews speak of feeling politically isolated, without an ideological home. Many left-wing political parties are anti-Israel. Many right-wing parties, some with anti-Semitic origins, are extremist and virulently anti-immigrant. And many Jews who have voted with the Socialist Party in France and Belgium worry that those parties are weak and becoming more dependent on fast-growing Muslim voting blocs.

Even among those inclined to condemn racism in any form, fighting anti-Semitism is no longer seen as a priority, with Jews often perceived as privileged compared with Muslims and other minorities confronted with discrimination.

Many younger Muslims often seem alienated in Europe. Struggling to find work and frustrated by their lack of acceptance, a small but vocal group of them has become inflamed by the politics of the Middle East, especially the Israeli-Palestinian conflict.

European officials are deeply concerned that radical Islam, nurtured in the Middle East, could take root in Europe. Mehdi Nemmouche, a French Muslim arrested in connection with the killings at the Jewish Museum in Brussels, fought as a jihadist in Syria. A French journalist who was held captive in Syria until April said Mr. Nemmouche had been one of his torturers.

"We are a microcosm of the Middle East," said Philip Carmel, European policy director for the European Jewish Congress. "The Middle East is being imported into Europe."

Visits to some of the flash points of the summer violence revealed a picture of what Prime Minister Manuel Valls of France has called a "new anti-Semitism." In Sarcelles, the Paris suburb where pro-Palestinian protests spiraled into riots, the alienation of France's immigrants and minorities lies just below the surface. In Brussels, the headquarters of the European Union, some secular Jews described a changing atmosphere and questioned whether it was time to leave.

And in Wuppertal, Germany, a city proud of its commitment to religious and ethnic diversity, the attempted firebombing of a synagogue exposed underlying tensions that became even clearer this month when, unexpectedly, a group of Muslim men patrolled a neighborhood wearing makeshift uniforms that said “Shariah Police.”

The French Melting Pot

On the afternoon of July 20, a siege mentality gripped Little Jerusalem, the Jewish commercial district in Sarcelles. A crowd of young Jewish men had gathered at the synagogue as a pro-Palestinian protest was held a few blocks away. France’s Interior Ministry had tried to ban the protest, which spun into a riot. Cars were burning. Young men were throwing rocks as the police fired tear gas. A Jewish-owned pharmacy was set on fire.

“We were all concentrated here to defend the synagogue,” said Levi Cohen Solal, 21, who joined the human cordon outside the synagogue. “Everybody was scared.”

Blocked by the police, the rioters never reached the synagogue, but Sarcelles became a televised symbol of France’s new anti-Semitism — a depiction many local residents did not recognize. A working-class suburb where generations of immigrants are packed into government housing, Sarcelles is a melting pot of religions and ethnicities, where many people speak of a largely peaceful coexistence.

To many residents, the demonstration, which was organized by outsiders on social media, was an indictment not of Sarcelles, but of France. Youth unemployment is soaring, especially in immigrant havens like Sarcelles, and many French-born children and grandchildren of immigrants have become alienated from French society.

“They have a real hatred against the state,” said Bassi Konaté, a city social worker, who added that many of the protesters came from poorer districts nearby. “A big proportion of these people feel neglected. A lot of these people don’t know anything about Gaza. But they want to confront the police.”

An early sign that these broader resentments were morphing into more open expressions of anti-Semitism came with the emergence several years ago of Dieudonné M’bala M’bala, a French comedian who lashed out at Jews and played down the Holocaust. He has since allied himself with Jean-Marie Le Pen, the 86-year-old founder of the far-right National Front, who this summer used an apparently anti-Semitic pun, which alluded to Nazi crematories, as a

riposte to a Jewish critic. Many of the comedian's shows have since been banned in France, but his popularity has continued to rise, unnerving many Jews.

"For the past four or five years, we have felt a growing insecurity," said David Harroch, who runs a Jewish bookstore in Little Jerusalem. "My customers tell me how worried they are about the climate here, the situation. A lot of people have left."

Israeli officials predict that as many as 6,000 Jews will migrate from France this year, a stark reversal from the 1950s, when Sephardic Jews, Arabs and others began arriving in Sarcelles from North Africa. A booming economy made work plentiful.

But during France's recession in the late 1970s, the city's ethnic groups became pitted against one another for limited public resources. Rahsaan Maxwell, a political scientist who has studied Sarcelles's ethnic groups, said the Sephardic Jews had incurred resentment because they were better organized and able to mobilize politically to win certain perks from the elected local council: a special Jewish section in the local cemetery, widening of a road in front of the main synagogue, kosher offerings at an annual city dinner for the elderly, and segregated swimming hours for men and women at a city pool.

In his 2012 book, "Ethnic Minority Migrants in Britain and France," Mr. Maxwell wrote that Sephardic Jews became so influential that "when Israel was at war with Lebanon in the early 1980s, Sephardic Jewish activists in Sarcelles were aggressive about using it as a litmus test for local politicians to see whether they supported Israel and the Jewish people."

Yet many Jews and Muslims born in that era grew up together without rancor in government housing. Not far from one of the city's storefront mosques is a small Superette grocery owned by a Muslim family. One of the owners, Abdel Badaz, recently stood behind the counter with a childhood friend, Mickaël Berdah, 36, a Jew whose family emigrated decades ago from Tunisia. They both criticized the riot as the work of young troublemakers.

"When you've grown up in the neighborhood, and you know everybody, there isn't that kind of hate," Mr. Berdah said. "When there is that kind of hate, it is at the roots, something about the way parents have educated their children."

Later, near the grocery, a tall teenager pedaled his bicycle toward two journalists and shouted at them to leave, saying the media had lied about Sarcelles. The youth, Diakité Ismael, 19, the

French-born son of Senegalese immigrants, soon calmed down and, like others, argued that there was no animosity in Sarcelles between local Muslims and Jews.

“Look,” he said, as a bearded Jewish man in a dark suit and skullcap walked by, “there’s one.”

But when asked about Gaza, Mr. Ismael became agitated, rambling and warning that the world was hurtling toward a catastrophe. He said he had seen video of an Israeli bomb hitting a funeral in Gaza. “Somehow, some Jews control politics, information, business and finance,” he said. “I’m not talking about the Jews here. I’m talking about Jews in general.”

“Jews, in general,” he added, “only let you see what they want you to see.”

In Brussels, Heightened Alert

Music rose from the center of Brussels on Sunday, with joggers and bicyclists moving freely down city streets as the seat of the European Union held its annual no-car day. It had the giddy air of a street fair, if less so for the city’s Jewish organizations, which the police had placed under heightened security since two recent incidents.

The first happened the previous Sunday, Sept. 14, which marked the European Day of Jewish Culture. As people gathered to dedicate a plaque at a Holocaust memorial, youths hurled stones and bottles until the police arrived. Three days later, a fire erupted on an upper floor of a synagogue in the city’s Anderlecht district; the authorities are investigating the incident as arson.

It was the May shooting at the Jewish Museum in Brussels — and the subsequent arrest of Mr. Nemmouche — that attracted international attention, as four people were killed, including two Israelis. But there have been smaller incidents that received less notice: a Turkish shop owner in Liège who posted a sign saying he would serve dogs but not Jews, a voice on the intercom of a commuter train that announced a stop as “Auschwitz” and ordered all Jews to get off.

“This summer, I started to see the world in a different way,” said Marco Mosseri, 31, a native Italian who works in the automotive industry in Brussels. “I was scared. I spent several nights without sleep. For the first time, I was thinking that maybe I could die from my religion.”

With its chocolate shops, Trappist beers and gray gloom, Brussels is the center of Europe’s sprawling bureaucracy, a symbol of the loathed policies of austerity. But Brussels also embodies the demographics transforming much of urban Europe, with generations of Muslim immigrants

and their descendants now representing roughly a quarter of the population.

The Jewish community is small, about 20,000 people, most of them assimilated, secular Jews like Mr. Mosseri, who usually do not draw attention to their heritage. (A recent report issued jointly by two European Jewish organizations found that 40 percent of European Jews hide their Jewishness.) Now some secular Jews say they have stopped wearing a necklace with the Star of David, or allowing their children to wear T-shirts for a Jewish summer camp on public buses or trains.

And since the start of the conflict in Gaza this summer, many describe social media, especially Facebook, as a swamp of hatred.

“I have friends who are never political and they are posting things about Gaza every day,” said Ms. Frommer, the employee of the nonprofit organization. “It seems like an obsession. Is your obsession because you want to save children, or because you have a problem with Jews?”

In a city so devoted to politics, the issue of Israel can seem unavoidable to some Jews, even those who strive to be apolitical or tend to be critical of Israeli policy. Ms. Frommer grew up in Brussels, but then left for college in Britain, followed by a long stint working in Cambodia. When she returned to Brussels four years ago, she was struck by how much more polarized life seemed. Her Jewish friends were sticking closer together as office chatter now sometimes bore a sharper edge.

This summer, one of her Belgian colleagues repeatedly mentioned the Israeli-Palestinian conflict. “He would often try to bring up the subject when I tried not to,” she said. “Then the subject would shift from Israel to Jews. Then it was, ‘Were there really six million Jews killed in the Second World War?’ ”

Nor was the comment isolated. There have been signs that anti-Jewish sentiment transcended the immediate backlash against the Gaza war. In Hungary, the rise of the far-right Jobbik party has brought concerns that anti-Semitic views are gaining mainstream traction.

In Italy, extreme right-wing activists were blamed for a flurry of anti-Jewish graffiti, including Nazi swastikas, on buildings in various cities. In Rome, fliers calling for a boycott of at least 40 Jewish-owned stores appeared last month with the signature of the far-right group Vita Est Militia. Italian investigators were also looking into whether such far-right parties were building

alliances with extremist left-wing groups.

In Brussels, several pro-Palestinian marches were held this summer, most of which were peaceful, but a few bore an anti-Semitic edge, including shouts of “Death to Jews!” While Belgian politicians quickly condemned the shooting at the Jewish Museum, some Jews felt the response to the protests, including that of the center-left Socialists, was tepid at best.

“The Socialist Party is afraid, because of the votes here in Belgium,” said Dr. Maurice Sosnowski, an anesthesiologist and prominent Jewish leader in Brussels. “In Belgium, they are not willing to speak loudly, because there are a lot of Muslims.”

In the nonprofit world of Brussels, the politics of Israel, which some on the European left view as essentially the pursuit of racist objectives against Palestinians, have made it difficult to keep the fight against anti-Semitism high on the agenda.

“Some see it in conflict with the anti-racism movement,” said Robin Sclafani, director of the Brussels-based group A Jewish Contribution to an Inclusive Europe. The organization, also known as CEJI, provides anti-discrimination training to teachers, social workers and others. Ms. Sclafani said she now receives numerous requests for training sessions to combat discrimination against Muslims, yet there is little interest in workshops on anti-Semitism.

“Nobody comes,” she said, adding that she has started pairing the sessions together.

Michaël Privot, director of the European Network Against Racism, said that blaming only the Islamic fringe for anti-Semitism discounted academic studies that show how deeply ingrained it remains among all Belgians — as well as other Europeans — and risked giving a free pass to right-wing extremist groups.

“You have, basically, a golden opportunity for the right fringe to blame it on Muslims and claim innocence,” Mr. Privot said.

On Sunday, as much of the city enjoyed the car-free streets of Brussels, a group of secular Jews gathered at the headquarters of CEJI with a visiting journalist to discuss ordinary life for them. Because of the heightened security alert, three plainclothes police officers were stationed in the lobby.

Like others in the room, Ms. Frommer described a growing sense of isolation. As a teenager, she participated in left-wing Jewish youth groups, but she said some of her friends were now attracted to the extremist right-wing party Vlaams Belang. The party is led by Filip Dewinter, an outspoken critic of Muslim immigration who has been courting Jews, despite his party's past links to anti-Semitism.

"I would never be able to vote for someone like that," Ms. Frommer said. "But some people are now. It is more and more legitimate to vote right wing."

She and others said that many friends were talking of moving to Canada or to the United States, if not Israel, even though they are uncertain whether their anxieties are fully justified.

"These are people with good jobs," she said. "And life is comfortable here. The big question is: Should we be paranoid or not?"

Anxiety in Germany

The news spread quickly in the early morning of July 29 among the Jews of Wuppertal, Germany. Someone had tried to firebomb the city's synagogue. The devices had failed to ignite, leaving the building with little damage, unlike the collective psyche of its members.

"For Jews in Germany, especially for us, this has very, very deep meaning," said Artour Gourari, a local businessman and synagogue member. "Synagogues are burning again in Germany in the night."

Nowhere in Europe has the postwar imperative to fight anti-Semitism been more complete — and more intertwined with national redemption — than in Germany. In Wuppertal, a manufacturing center, the city's synagogue was burned in 1938 during the two-day rampage known as Kristallnacht, when an anti-Jewish pogrom swept across Nazi Germany.

After the war ended, Wuppertal's Jewish community had no synagogue and, with only 60 members, seemed destined for extinction. But with the collapse of the Soviet Union in the 1990s, the German government opened the country to persecuted Soviet Jews, and soon refugees from Uzbekistan, Belarus, Ukraine and Russia had settled in Wuppertal. The local Jewish population reached 2,500. The presidents of Germany and Israel attended the 2002 inauguration of the new synagogue.

Now a police van is stationed around the clock in a small park across from the synagogue. The police have arrested three suspects in the firebombing attack, all Palestinians, including one from Gaza, as well as a 17-year-old refugee. The refugee has lived in Wuppertal for two years, among the different Muslim communities of Turks, North Africans and asylum seekers from Egypt, Syria, Jordan and Lebanon.

Until the synagogue attack, Wuppertal officials had taken pride in the peaceful coexistence of so many religions and ethnicities. Many of the older Muslims had arrived in the 1960s for work but assumed they would eventually return to their home countries. Now a third generation, born in Germany, is growing up with different expectations, as well as a sense of alienation.

“They have to justify why they don’t fully belong to the society,” said Samir Bouaissa, a local Muslim leader.

One of the local high schools is named after a famous Jewish poet, Else Lasker-Schüler, and is commonly called “The School Without Racism.” Yet two recent graduates described rising tensions in the multiethnic student body, including resentment by some Muslim students over a sister-school arrangement with a school in Israel. This summer, during the Gaza crisis, several Muslim adolescents began circulating anti-Israel posts on social media.

This one “got shot yesterday,” said a Facebook post from Gaza shared by a student. It showed a photograph of a female Israeli soldier and added an obscenity. The student added his own postscript: “You get what you deserve.”

Antonia Lammertz, 19, a recent graduate, said only a small minority of students were extreme but that a softer bias was common even among the mainstream. “In my school, to be called a Jew was to be cursed, or insulted,” she said, noting a problem that officials have tried to root out at many German schools.

City religious leaders reacted quickly after the synagogue attack. Imams and Christian ministers rushed to the building to pledge support. More than 300 people came to a hurriedly organized peace meeting the next day.

“People were shocked,” Mr. Bouaissa said. “A threat against one of our religious houses is a threat against all of us.”

Earlier this month, the city's religious leaders, including many Muslims, got another shock: a small group of men, one only 19, spent an evening walking through a Muslim neighborhood, lecturing young people about vices like gambling (while apparently not mentioning Jews). They were wearing orange jackets that read "Shariah Police." The leader was a Salafist, Sven Lau, who called the event a one-time publicity move to stir more "Islamic discussion."

That, it did. Local prosecutors filed charges. German officials, including Ms. Merkel, reacted with a blend of shock, indignation and alarm, while mainstream Muslims also protested. And local neo-Nazis responded with their own patrol, dressing in red pullovers and pledging to protect the public from Islamists.

For Leonid Goldberg, the community leader of the Wuppertal synagogue, the emergence of a radical Islamic fringe is less a surprise. Just four days before the synagogue attack, someone had spray-painted "Free Palestine" on the front wall of the building. In recent years, Mr. Goldberg has used a celebration of Rosh Hashana at the synagogue — an event attended by elected officials and religious leaders of the city, including Muslims — to warn about rising anti-Semitism among extremist Muslims in the city.

"No one wanted to hear that," he said.

Divisions Grow as a Downturn Rocks Europe

By **LIZ ALDERMAN** and **ALISON SMALE** AUG. 29, 2014 . NYTimes



PARIS — Six years after being struck by economic crisis, Europe is facing a fresh downturn, with few new ideas on the table for reigniting growth and deepening political divisions over the austerity policies that many blame for worsening the malaise.

German Chancellor Angela Merkel, with Spanish Prime Minister Mariano Rajoy, in Spain. Miguel Riopa/Agence France-Presse — Getty Images

Even as the United States

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economy [rebounds](#) from its worst recession since the 1930s, Europe is heading in the opposite direction. A halting recovery that took hold in the 18-nation euro currency bloc in the last year has now gone into reverse as Germany, France and Italy, its three largest economies, stumble anew. Some analysts say the region could be headed for another full-scale recession — a slowdown that could have ramifications in the United States, Europe’s biggest trading partner. For American companies that do business in Europe, profits would suffer.

Germany, the Continent’s economic engine, [contracted](#) in the second three months of the year, while the bloc of 18 European Union nations that use the euro failed to grow at all. Political and financial instability related to Russia’s confrontation with Ukraine and the effects of escalating economic sanctions between Europe and Russia have further clouded the economic outlook.

Diverging Paths

The eurozone and the United States both rebounded from the worst of the economic crisis, but while the United States economy has consolidated much of those gains, the eurozone has continued to struggle.

GROSS DOMESTIC PRODUCT

Annual rate of change, quarterly

+2%

+1

United States

Unemployment, which in the United States has fallen to 6.2 percent from a peak of 10 percent in 2009, has fallen only marginally in Europe, to 11.5 percent in July from a peak of 12 percent last year, according to figures released on

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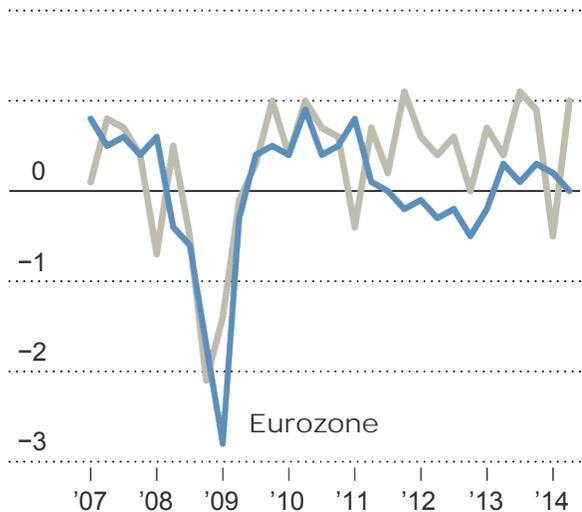
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AUG. 22, 2014



France Acknowledges Economic Malaise, Blaming Austerity

AUG. 20, 2014



Source: Eurostat

Note: Figures are seasonally adjusted. G.D.P. figures are also adjusted

Friday.

“Europe is at risk of secular stagnation,” said Lawrence H. Summers, a former United States Treasury secretary and former economic adviser to President Obama, referring to a [situation](#) in which very sluggish economic growth becomes the new norm. Unless governments find a solution, he added, “there is little chance that reasonable and rapid growth is going to return to the eurozone.”

The fresh downturn has worsened tensions between European leaders and Chancellor Angela Merkel of Germany. Ms. Merkel continues to stand by an austerity program that she considers essential to financial stability, but that many critics now say is only deepening Europe’s woes and leaving it at risk of losing a generation of growth.

The situation has placed additional pressure on Mario Draghi, president of the European Central Bank, to act more aggressively, much as the Federal Reserve has in the United States, to stimulate the economy through bond purchases. In a [speech](#) last week at a Federal Reserve conference in Jackson Hole, Wyo., Mr. Draghi for the first time challenged the austerity consensus, suggesting that European governments might need to relax their budgets in the short run to give their economies a kick.

Action by the European Central Bank, which meets in Frankfurt next week, has become

more urgent in the face of signs of another potential menace: deflation, a downward spiral in prices and wages that could further crimp Europe’s recovery prospects. On Friday, Europe’s statistical agency reported that inflation declined again in August to its lowest level since 2009.

“This is a major red light” for Europe, said Jean-Paul Fitoussi, a professor of economics at the Institut d’Études Politiques de Paris. “We need to change the direction of policy to avoid a situation with potentially

worrisome consequences for society and politics.”

It is not clear that a shift in monetary policy alone can reinvigorate the European economies. President François Hollande of France, whose government has been in [turmoil](#) after a failed effort by a left-leaning minister to challenge Germany’s economic prescriptions, on Thursday called for a “eurozone summit” to restore growth and investment in the euro area “as soon as possible.”

A new approach is needed, Mr. Hollande told a conference of French ambassadors in Paris, because “the recovery is too weak, because inflation is too low, because the euro is too strong, and because Europe is menaced by long and possibly interminable stagnation if we don’t act.”

Mr. Hollande, a Socialist who as a candidate promised a new economic approach, has shown little willingness to break decisively with Germany over Ms. Merkel’s insistence that keeping government debt under control is the precondition for long-term prosperity.

Still, France, Italy and a number of other countries are likely to press within the European Union in coming months for a loosening of deficit-reduction targets for the next several years.

The austerity program has helped Spain, Ireland and other troubled economies regain their ability to borrow money in the bond markets. But critics say that forcing countries to cut spending and raise taxes to meet fiscal targets while in recession also delayed and weakened the economic recovery, impeding job creation and income growth.

Ms. Merkel, while agreeing that growth is important, continues to rebuff calls for a change in German policy.

“We can talk about whether you make 2 or 3 percent more debt, or 1 percent, or, like us, a balanced budget,” Ms. Merkel said this week. “But one really must question whether we can go on receiving less than we spend, so that our debts keep on growing. Indeed, a whole crisis of confidence has grown out of that.”

Still, she hinted she could be more flexible if countries undertook reforms to revive competitiveness. Spain, which adopted more business-friendly labor laws and other structural changes to its economy, is one of the few eurozone countries to show signs of recovery. In a visit this week with Prime Minister Mariano Rajoy, Ms. Merkel praised Spain as a model for how to rebound from the crisis.

Ms. Merkel has remained unmoved by her critics, even as Germany’s economy has slowed and been challenged by new pressures

RECENT COMMENTS

Joel Andrew Nagel

Yesterday

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Bill M 2 days ago

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like the confrontation with Russia over Ukraine. To some degree, the slowdown in Germany is being driven by a lack of demand for its exports from neighbors like France and Italy, which, lacking the ability to use government spending to spur growth, have struggled to gain economic traction. Italy, the third-largest eurozone economy, has returned to recession and remains saddled with a debt equal to 136 percent of gross domestic product, the highest ratio in the eurozone after Greece. Analysts said a new crisis in Italy could reignite fears that the eurozone will come apart.

Germany is further vulnerable to the strife in Ukraine. Sales of machinery to Russia, the industry's fifth-largest export market, fell 19 percent in the first six months of the year. On Thursday, Ms. Merkel said the European Union would discuss tougher sanctions this weekend, hours after Kiev accused Moscow of a fresh incursion.

Germany is also grappling with its strained relationship with France, where Mr. Hollande is having trouble holding his party together as calls increase to challenge the supremacy of German economic policy leadership. While the two recessions that have hit France in the last five years have not been as deep as those in other countries, growth has failed to revive meaningfully.

Germans worry about the imbalance between the Continent's two essential powers, while French leaders feel belittled by Ms. Merkel, who "wants to give us lessons," said Jean-Christophe Cambadélis, a prominent French Socialist. "We are a great nation trying to pull ourselves together. We are not one of the German länder," he added, using the German word for its 16 states.

"Germany is a strong country, but it is too weak to lead the Continent alone," said Guntram Wolff, a German who runs the Bruegel organization in Brussels. While trade with France is important, their common projects — monetary union, the European Union itself, centuries of shared history — count for much more, he said.

A prolonged downturn in Europe, should it happen, could weigh on the American recovery and have far-reaching consequences for European society and politics at a time when far-right forces have emerged as challengers in France, the Netherlands, Greece and elsewhere, analysts

looking through rose colored glasses at Wall Street not...

Claude Crider 2 days ago

Those who forget the lessons of John Maynard Keynes are doomed to repeat them. The US can't be far behind.

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said.

And as American imperatives point toward more multilateralism, Mr. Summers said, “a greatly diminished and stagnating Europe will mean that the United States will increasingly lack its best partners.”

Liz Alderman reported from Paris and Alison Smale from Berlin. Jack Ewing contributed reporting from Frankfurt.

A version of this article appears in print on August 30, 2014, on page A1 of the New York edition with the headline: Divisions Grow as a Downturn Rocks Europe. [Order Reprints](#) | [Today's Paper](#) | [Subscribe](#)

PCAST's agenda, MIT, and Scientific Acceleration: A (global) "Inventions Wanted. . . :

Brownbag idea

From: "Lloyd Etheredge" [REDACTED]

Date: Wed, October 1, 2014 11:05 am

To: [REDACTED] [more](#)

Cc: [REDACTED] [more](#)

October 1, 2014

Dr. Eric Lander (Co-Chair) and Colleagues
President's Council of Advisers on Science and Technology

Dear Co-Chair Lander and PCAST Colleagues:

I enclose a new idea and recommendation for PCAST to support an "Inventions Wanted . . ." global project. A new (post-MOOC) design - a "Global Tuesday Brownbag" - concerning specific, high priority challenges can focus attention, inform a large N of interested members of the international scientific community across disciplinary boundaries, and stimulate creative thinking and discussion.

I predict that the idea can be applied to produce a spectacular increase in the rate of scientific innovation in each field.

- I write to recommend that members of PCAST might want, individually, to develop prototypes and tests of the prediction. The enclosed suggestion (to Dr. Susan Hockfield to accelerate genetics-based agricultural inventions to achieve Dr. Swaminathan's "Zero Hunger" goal might be an attractive prototype for development at MIT, building on your genetics-based [Introduction to Biology](#) edX MOOC and MIT's traditions.

We might be surprised to discover how much capacity for scientific problem-solving and human progress is under-used, worldwide. And how much fast, cross-breeding information systems, supported by new technology and new design teams, now can contribute to using this potential.

- I predict, as a parallel benefit, that these new applications of global technology will capture the imagination of students worldwide. This idea adds a new dimension to achieve your goal to motivate recruitment to STEM education, careers, and future accomplishments.

with my best regards,
Lloyd Etheredge

Dr. Lloyd S. Etheredge - Project Director, International Scientific Networks
Policy Sciences Center

[REDACTED]
Bethesda, MD 20817-1204

URL: www.policyscience.net [REDACTED]

Please reply to: [REDACTED]

[The Policy Sciences Center, Inc. is a public foundation that develops and integrates knowledge and practice to advance human dignity. It was founded by Harold Lasswell, Myres McDougal, and their associates in 1948 in New Haven, CT. Further information about the Policy Sciences Center and its projects, Society, and journal is available at www.policysciences.org.]



international biomedical acceleration package that combined a video service (via NIH) for lectures and research presentations and shifting print publications into electronic form. Today, global Internet video is widely available.

Could I meet with you? I would love to work on this project, which I believe can be a spectacular success. I hope that you can provide a light touch of high-level leadership to design, organize, and identify funding for an initial series. Also, if there are a team of people at MIT with an interest to design and support a large-scale collaboration system for "Inventions Wanted . . ." challenges and to learn lessons about how to design a fast, cross-breeding process and accelerate creativity on a global scale, these are among the several dimensions of this new rapid learning system that might be addressed.

I enclose a communication from Dr. Swaminathan (89), also a Fellow of the World Academy of Art and Science. [The founders of the WAAS during the Cold War included several Yale faculty members - e.g., Lasswell (former President), McDougal, Reisman (a former Board member) and Shubik; in my generation Garry Brewer and I are Fellows and Winston Nagan, a Yale Law graduate and former Chair of Amnesty International (US) is Chairman of the Board.] The WAAS (N=750, across many fields and nations) can help to network ideas and build engaged audiences, but the project requires leadership, fundraising, and a home at a major scientific research institution.

I work in the Washington, DC area (301)-365-5241. I would be pleased to meet in either Cambridge or Washington, at your convenience.

With my best regards,



Dr. Lloyd S. Etheredge,
Project Director

cc: LSE, Exchange of email with Dr. Swaminathan

LSE, "Three Projects to Accelerate Scientific Innovation in Agriculture (& Other Fields),
draft (9/3/14): M. S. Swaminathan, "Zero Hunger," Science (August 1, 2014) attached.

LSE, "An Experiment to Accelerate Scientific Innovation," 11/7/2008 (draft discussion paper
for the World Academy of Art & Science)

Zero hunger

The United Nations (UN) designated 2014 as the International Year of Family Farming, recognizing that an estimated 500 million family farms, involving over 2 billion people, play a key role in food production and consumption worldwide. It is thus an opportune time to encourage a shift in tackling global hunger—from a “food security” focus to an agenda that promotes “nutrition security” instead. The drive to reduce hunger in the world has largely relied on crops such as wheat and rice that provide calories. But an increase in calories alone is not good enough. Improved diets and good health require bolstering nutrition.

Food security programs begun since World War II, both by national governments and international agencies such as the UN Food and Agriculture Organization and the UN World Food Programme, were generally designed to address undernutrition. Ironically, this approach has led to malnutrition in some cases. For example, support for the growth and distribution of high-yielding cereals has led to predominantly cereal-based diets with deficiencies in proteins and micronutrients. Consequential health problems have been seen in several parts of India and South Asia. Such hidden hunger is ample reason to pursue crop planning that fulfills the macro- and micronutrient needs of populations in an integrated manner. Diet deficiencies of iron, zinc, iodine, vitamin A, and vitamin B12 deny nearly two billion people a healthy life. Commercial farming tends to promote market-driven monoculture of food crops, in which prioritizing nutrient need is generally absent. Without mainstreaming nutritional criteria in large-scale agricultural cropping and farming systems, the prospect for meeting the UN's Zero Hunger Challenge by 2025 will be dim.

Family farming is characterized by diversified crops and hence can be harnessed to support nutrition-sensitive agriculture. The steps needed to achieve such a change include survey and identification of the major nutritional problems prevailing in an area. Appropriate changes in crops to address the deficiencies can then be

made on family farms. Also needed is the standardization of measurement tools to estimate the impact of the nutritional interventions on human health. This can be done by using internationally accepted measurement criteria, such as stunting among children below 2 years of age. Members of elected local bodies could be educated in the nutritional deficiencies that can be overcome through a food-based approach. These efforts are being implemented in several hunger hotspots in India such as the tribal areas of Odisha, Kerala, and Maharashtra.

In March, encouraging examples of how to enrich staple crops with desired micronutrients were presented at the Second Global Conference on Biofortification held in

Kigali, Rwanda, reflecting a growing interest in biofortification among scientists and public health professionals. Many plants such as sweet potato, breadfruit, moringa, and various berries are rich in micronutrients such as iron, zinc, vitamin A, and vitamin C. Such naturally biofortified plants should find a larger place in family farming. In addition, food crops can be enriched with specific nutrients through plant breeding, as has been done with rice, wheat, cassava, beans, and pearl millet under the Harvest Plus program of the CGIAR Consortium of International Agricultural Research Centers. CGIAR works with partners to distribute technologies and resources, including to small farms, and is a model for the development of similar efforts. In the meantime, our knowledge

of how to assess risks and benefits regarding genetically modified crops will hopefully grow. Golden rice, genetically enriched in vitamin A, demonstrates the potential of this approach. But regulatory mechanisms are needed to assess the biosafety of such varieties in a scientific and transparent manner.

Family farming offers an effective and economic solution to help meet the challenge of making sure that each person has access not just to calories but to nutritious food. With an estimated 8 billion mouths to feed by 2025, we must think much more precisely about the best solutions for reaching zero hunger.

– M. S. Swaminathan



“Family farming offers an effective and economic solution to...making sure that each person has access...to nutritious food.”



M. S. Swaminathan is the Founder Chairman of the M S Swaminathan Research Foundation, Chennai, India. E-mail: swami@mssrf.res.in

Three Projects to Accelerate Scientific Innovation in Agriculture (& Other Fields)

by

Lloyd S. Etheredge *

It should be possible, with a light touch of leadership, to accelerate scientific innovation in many fields. The compelling human agenda articulated by M. S. Swaminathan (“Zero Hunger”) in Science¹ to support 500 million family farms by scientific innovation (e.g., biofortification of food crops) and other initiatives suggests three projects that can use Internet technology to accelerate the scientific creative process in new ways.

1.) Provide a <http://www.videocast.nih.gov> service for agricultural research (and for each scientific field that we want to accelerate). The National Institutes of Health/National Library of Medicine system has pioneered extraordinary resources to support basic and applied biomedical research and innovation. Their videocast.nih.gov service efficiently uses NIH’s 27 Institutes and Centers and their lectures and conferences as a capture point to provide a selection of the best and latest ideas, 1-2 years before print publication and without charge, to the desktops of researchers in academic settings and the private sector worldwide.² A Director’s Series gives high visibility to boundary-crossing scientific ideas.

The remarkable NIH service (now, with an archive of 7,300+ events) provides biomedical research with a fast, cross-breeding information system for leading edge ideas. It allows policymakers (and agenda-building discussions of NIH advisory committees) to reach wide audiences quickly. The service builds culture and it creates an online reality that extends the excitement of scientific discovery in biomedical research to wider networks.³

2.) An “Inventions Wanted . . . “ Weekly Colloquium Series to Engage the World’s Scientific Brainpower. Often, today’s scientific creativity involves a combinatorial process, connecting ideas from different fields in new ways. A brilliantly-designed, high visibility global webinar series would be ideally suited to support this process. A weekly “Inventions Wanted . . . ” webinar can brief, and stimulate creative thinking by, a wide universe of interested scientists and students, in all fields and countries, and in academic and for-profit settings.

* Director, International Scientific Networks Project, Policy Sciences Center. URL: <http://www.policyscience.net>; lloyd.etheredge@policyscience.net, [REDACTED] FT (9/3/2014). Comments welcome.

Scientists love challenging problems. The “Inventions Wanted . . . ” weekly brownbag would be an event that nobody would miss. It could produce, within months or years, innovation that might otherwise require decades if the world relies upon print media (expensive for many users, and with limited circulation) and a limited number of researchers without access to the full range of ideas that might usefully be connected. A key breakthrough might come from a current graduate student in China, listening to a Webinar challenge, who begins to think about a problem.

- For example, the first “Inventions Wanted . . . ” project could organize a series of weekly briefings by senior researchers about a.) the challenge to improve biological nitrogen fixation (and reduce the need for commercial fertilizers), what is known about plants that can do this, the theoretical and technical challenges of genetic upgrades, what people are trying, and where they are stuck.⁴ The project’s planners might include a large-scale collaboration system to capture new ideas and suggestions from participants and provide online access to articles and papers.⁵

A first step might be to organize a working group to survey the challenges for breakthrough agricultural research that can be structured for the “Inventions Wanted . . . ” global system; and to give thought to the best way to organize creativity-stimulating presentations, manage, and learn lessons about the global innovation process.

3.) A (Full) Global MOOC Curriculum. New, affordable global online courses (MOOCs) make it possible to provide students in all countries with a curriculum, in all fields, equal to the best in the world. Now, a key step for a strategic plan to accelerate global scientific innovation and economic benefit in agriculture (or any field), is to decide what MOOC packages should be organized and underwritten, by whom, to support a full range of jobs, business opportunities, and leading-edge science?

A first step would be to organize a working group, with leading research scientists and educators, potential underwriters, and specialists in government services to agriculture, and starting new companies. The task of the working group would be to identify the full package of basic STEM (science, technology, and mathematics) and specialized courses and advanced global webinars that leaders in these fields want to have available for agricultural science.⁶ Additional Fast Track conferences might accelerate plans in selected countries or regions (e.g., India, Spain, Brazil, Eastern Europe) to use new MOOC technology and this new curriculum to support family farms and create business opportunities.⁷

Notes

1. August 1, 2014, 345:6196, p. 481, attached.
2. An original justification is that the service allows NIH researchers to use their time more efficiently and to view more presentations (that they could not attend physically). Beyond simple videocasting, the New York Academy of Sciences (www.nyas.org) has experimented with an ebriefing option, with indexing and enhancements for skimming and accessing parts of lectures for 100 events/year. The NYAS system also supports the Scientists Without Borders initiative, <https://www.scientistswithoutborders.org/>
3. It also enriches the flow of leading edge ideas/speakers series at every individual four-year college and university. It also provides national and global access to researchers and students with limited resources to attend scientific conferences in person.
4. E.g., S. C. Wagner, "Biological Nitrogen Fixation," online at <http://www.nature.com/scitable/knowledge/library/biological-nitrogen-fixation-23570419>
5. Dr. Swaminathan's goal suggests a large potential agenda for an "Inventions Wanted . . ." project, including: b.) biofortification. Other challenges might include c.) creating food crops that can grow in sea water, allowing oceans to be planted or irrigation by sea water; d.) Improved efficiency of photosynthesis and - since some plants grow faster than others - otherwise discovering ways to accelerate their growth process; or to enhance growth at winter temperatures with winter sunlight; e.) Inventing new bio-fertilizers that can allow a powder, with a collection of microbes, to enrich different soils and substitute for commercial petroleum-based fertilizer or otherwise improve growth and health of crops; f.) Evaluating the potential for large N databases and *in silico* research. Agricultural science primarily has relied upon experimental methods but a scientific strategy for breakthrough discoveries could be designed to include (as it is emerging for biomedical research and health) large online genetic databases, possible individualized records for large N's of plants of each species, and free online supercomputing and analysis tools for academic researchers and students, and startup companies, in all countries; g.) Thinking more widely: the physicist Freeman Dyson has proposed the invention of "carbon-eating trees" as a solution to global warming. He forecasts that the scientific discoveries might take several decades, but the new system for agricultural research might produce discoveries and global benefits more quickly. (Freeman Dyson, "The Question of Global Warming," The New York Review of Books, 55:10 (June 12, 2008). Online at www.nybooks.com. See also the letters and exchanges in issues of 7/17, 9/25, and 10/9, *ibid*.
6. A pioneering step has been taken by MIT, where Dr. Eric Lander and his associates now offer the genetics-oriented Introduction to Biology course (7.00x) to shift undergraduate curriculum (and assist secondary school biology teachers) to build capabilities for the new era of genetics-based research and applications. Online, without charge, through www.edx.org.
7. See the planning work of a World University Consortium: <http://www.wunicon.org/>

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Kigali, Rwanda, reflecting a growing interest in biofortification among scientists and public health professionals. Many plants such as sweet potato, breadfruit, moringa, and various berries are rich in micronutrients such as iron, zinc, vitamin A, and vitamin C. Such naturally biofortified plants should find a larger place in family farming. In addition, food crops can be enriched with specific nutrients through plant breeding, as has been done with rice, wheat, cassava, beans, and pearl millet under the Harvest Plus program of the CGIAR Consortium of International Agricultural Research Centers. CGIAR works with partners to distribute technologies and resources, including to small farms, and is a model for the development of similar efforts. In the meantime, our knowledge

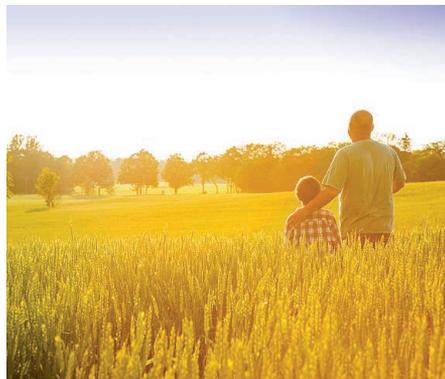
of how to assess risks and benefits regarding genetically modified crops will hopefully grow. Golden rice, genetically enriched in vitamin A, demonstrates the potential of this approach. But regulatory mechanisms are needed to assess the biosafety of such varieties in a scientific and transparent manner.

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– M. S. Swaminathan



M. S. Swaminathan is the Founder Chairman of the M S Swaminathan Research Foundation, Chennai, India. E-mail: swami@mssrf.res.in



“Family farming offers an effective and economic solution to...making sure that each person has access...to nutritious food.”

MSS/DB/

13 Aug 2014

Dr Lloyd Etheredge

cc: [REDACTED]

Dear Dr Etheredge,

Thank you very much for your kind letter concerning my Editorial in Science. I am grateful to you for the action you have suggested to the World Academy. I hope the Academy will help to overcome the zero hunger challenge.

With warm personal regards,

Yours sincerely,

M S Swaminathan

Cc: Ms B Jayashree

=====
PROF M S SWAMINATHAN
Founder Chairman, M S Swaminathan Research Foundation
Third Cross Street, Taramani Institutional Area
Chennai - 600 113 (India)

[REDACTED]
Email: swami@mssrf.res.in

From: "Lloyd Etheredge" [REDACTED]

To: [REDACTED]
[REDACTED]
[REDACTED]

[...]

Sent: Wednesday, August 13, 2014 1:47:35 AM

Subject: WAAS: Dr. Swaminathan's "Zero Hunger" commitment and dimensions of a global rapid learning system

Dear Garry and Heitor, and World Academy planners and colleagues;

I enclose an editorial by Dr. M. S. Swaminathan, concerning the global goal of "Zero Hunger," from the August 1, 2014 issue of Science. This is one of the most compelling visions in the world and it is linked to UN initiatives (2014 is designated as the International Year of Family

Farming) for biofortification and support for the 500 million family farms

Would it be possible for the World Academy to add several dimensions of a global rapid learning system as part of our leadership to develop online resources for global higher education and scientific progress?

Just to suggest two, very preliminary, ideas:

Perhaps we could take a look at initial experiments to accelerate the global process of scientific innovation for biofortification? For example:

1.) a global colloquium service using the WAAS Consortium Website that secures lectures and research presentations, from leading research Centers worldwide, and makes them available, as quickly as possible, on the desktops of research scientists, students at all educational institutions, and government officials and professionals in all countries? [For the evolution of a global rapid learning system for biomedical research, the <http://www.videocast.nih.gov> Website, capture point, and global service has supported fast, cross-breeding networks for scientific innovation and collaboration.]

- A more focused experiment, an "Inventions Wanted. . . ." colloquium series, could take one specific challenge of safe, biofortification, genetic engineering for one plant species and provide a weekly briefing series for several weeks, to scientists worldwide and across disciplines, It is not yet clear how such a global, large-scale, IT supported, cross-disciplinary collaboration system could be designed to support Dr. Swaminathan's vision, but it would be exciting to work on initial experiments for enrollment and to use our global creative resources for creative problem-solving. We might be able to move very quickly.

- 2.) Could the WAAS use its good offices to organize the vision for the entire online curriculum, with MOOCs and other educational materials equal to the best in the world, that should be online to support all of the capabilities needed for rapid learning and system-level progress? The curriculum would range from high-end genetic science to basic training for the agricultural outreach advisers and human relationships that are essential to agricultural innovation and support for the 500 million family farms to which the UN plan assigns a critical role to achieve new capabilities by 2025. And a much broader curriculum for today's students who, in their turn, might lead NGOs, or (as citizens) providing knowledgeable support to the agenda. Or, in UDCs, will have family ties that can accelerate the adoption of agricultural innovation and provide investment capital and support for new business development?

Dr. Swaminathan is a World Academy Fellow. Bob Fuller, a physicist who spoke at the Berkeley conference, had an early leading role to develop a global movement of support to end hunger. He may have thoughts about how initial experiments for this next stage of a global process for rapid learning, and zero hunger, could be developed.

my best regards,
Lloyd

Dr. Lloyd S. Etheredge - Project Director
Policy Sciences Center
c/o 7106 Bells Mill Rd.
Bethesda, MD 20817-1204
URL: www.policyscience.net; [REDACTED]

Please reply to: [REDACTED]

[The Policy Sciences Center, Inc. is a public foundation that develops and integrates knowledge and practice to advance human dignity. It was founded by Harold Lasswell, Myres McDougal, and their associates in 1948 in New Haven, CT. Further information about the Policy Sciences Center and its projects, Society, and journal is available at www.policysciences.org.]

An Experiment to Accelerate Scientific Progress

by

Lloyd S. Etheredge¹

I. Background

Several months ago Freeman Dyson discussed the science of climate change and policy options in The New York Review of Books (Attachment 1).² One visionary possibility is to design plants that will biologically sequester atmospheric carbon dioxide: such breakthroughs can help to mitigate the long-term effects of human activity on climate change. Dyson (who calls them “carbon-eating trees”) writes:

“Carbon-eating trees could convert most of the carbon that they absorb from the atmosphere into some chemically stable form and bury it underground. Or they could convert the carbon into liquid fuels and other useful chemicals. Biotechnology is enormously powerful, capable of burying or transforming any molecule of carbon dioxide that comes into its grasp. . . . If one quarter of the world’s forests were replanted with carbon-eating varieties of the same species . . . the carbon dioxide in the atmosphere would be reduced by half in about fifty years.”³

¹ Policy Sciences Center, Inc. 127 Wall St., Room 322 Box 208215 New Haven, CT 06520-3215. (301)-365-5241 (o); Email: lloyd.etheredge@yale.edu; URL: <http://www.policyscience.net>. This draft paper has been prepared for discussions of the World Academy of Art and Science.

² Freeman Dyson, “The Question of Global Warming,” The New York Review of Books, 55:10 (June 12, 2008). Online at www.nybooks.com. See also the letters and exchanges in issues of 7/17, 9/25, and 10/9, ibid. Page numbers refer to the pages in the appended copy.

³ Op cit., p. 9.
DRAFT 11/7/2008

Dyson estimates that it may require 20-50 years for the necessary scientific breakthroughs. But could they be achieved more quickly?

II. Proposal

I believe that the capacities of the emerging global Internet can be used boldly to build large-scale collaboration systems and accelerate the creative process to solve this problem. This paper suggests an experiment to test this possibility.⁴

- Specifically, I suggest that the World Academy of Art and Science play a leading role to identify partners and convene an international working group to plan, raise funds for, and organize such an experiment. The goal will be to create and test the best design for Internet-based acceleration to address these urgent challenges and achieve the required breakthroughs quickly.

One possibility is that the working group could assemble a professional production team and design a series of three “Inventions Wanted . . .” global colloquia (for an audience of scientists in all countries and fields). These high-visibility colloquia (e.g., to be scheduled in 2009 on the first Tuesday of the month for three months) will focus attention and convey scientific briefings about the possibility that Dyson has discussed; define relevant questions, foster fresh thinking, and accelerate the creative process; and enroll wider participation in the search for breakthroughs. The working group also will

⁴The late Marshall McLuhan observed that the revolutionary potential of new communication technologies is greater than it initially appears because early applications merely use new technology for established behavior. Thus, the early use of the motion picture camera was to place the camera at a fixed position and film stage plays. Similarly, the use of Internet multimedia still focuses on putting scientific lectures and conferences online, to be viewed by audiences as if they were attending standard lectures and conferences in physical reality. A bold prototype to accelerate the biological sequestration of atmospheric carbon-dioxide can help us to learn lessons about the design of next-generation applications.

develop a Website with online resources and capabilities to support a fast, cross-boundary, creative process.⁵

For example:^{6 7}

Session 1 will brief the world's scientists about Dyson's analysis and the importance of the challenge. It might include a state-of-the-art discussion of what we know about photosynthesis and the plant biology involved in capturing, storing, changing, and releasing atmospheric carbon-dioxide and/or analogous processes.⁸

Session 2 of "Inventions Wanted . . ." might include an expert briefing about the diversity of known land and ocean plants with desirable properties and our relevant genetic knowledge about these species. [I.e., a good strategy might be to identify plants that already sequester carbon-dioxide permanently (if any exist) and/or that are good performers at other sub-tasks (e.g., acquiring large quantities of atmospheric carbon-

⁵ A site with interesting ideas for creative scientific uses of Internet technology is <http://www.scivee.tv> developed by the San Diego Supercomputing Center, NSF, and the Public Library of Science. See the discussion by the co-founder, Phil Bourne, at http://www.scivee.tv/scivee_overview.

⁶ I am suggesting this outline for the purpose of getting discussion underway - I am not a biologist. The best design of discussions for a global scientific audience to stimulate the creative process will be part of the challenge for the working group and its production team.

⁷ One of the temptations may be to simplify discussions to reach a wider audience. Such programs might *evolve* from these brownbags (e.g., in the US, the NOVA series on the Public Broadcast System; or a Discovery Channel program for high school science students) but it would be a mistake to water-down these professional colloquia.

⁸ It may be helpful to recognize several environmentally-relevant breakthroughs that already have been achieved. For example, I understand that micro-organisms have been developed that can live happily underground in coal mines, eat coal, and convert it to natural gas.

dioxide)].⁹ Leading current researchers might describe their strategies, where they are stuck, and where breakthroughs, additional researchers, and fresh ideas would help.¹⁰

Session 3's design would be an open-ended challenge to the planners. It will use feedback and discussion from the two original sessions to fashion and support the creative process on a global scale. . . . Session 3 may discover that the most important contributions and catalysts for the road ahead are unexpected and that the fast, cross-breeding, possibilities of the Internet are especially useful to elicit these interdisciplinary and unexpected connections.^{11 12}

⁹ I am indebted to a panelist at a session organized by Pushpa Bhargava at the recent WAAS meeting for this suggestion. He thought that engineering new plants that can survive in natural settings will be more difficult than enhancement of attractive properties that exist in known plants.

¹⁰ Key papers, lists of sources of specimen plants, and other resources could be part of the Website. While the online discussions would be focused for research scientists, the supporting material could recognize a cross-generational engagement in scientific problem-solving, with additional material that could be used by secondary school, undergraduate, and graduate students who become interested in these challenges. Would there be useful experiments or observations that smart high school students, in many countries, could undertake?

¹¹ For example: Session 3 might include a panel of (known) brilliant scientists who could help to think aloud about the swirl of ideas and creative possibilities suggested by the world's viewing scientists. (In addition to benefits to the future of the planet, there may be many fortunes to be made if breakthroughs are possible and many of the world's forests are to be replanted. If the "Inventions Wanted . . ." panel also included scientists with passionate interests and deep corporate pockets - e.g., Craig Venter - this may add a touch of keen interest to the project.)

¹² There are concerns about whether scientists will divulge their best ideas in these public (global) arenas. However this is a standard issue in all scientific conferences and there are well-established norms for trading partial information (and later collegial speculating about what is not being disclosed). Also these global discussions will be highly attractive opportunities for participation: we can anticipate that they will be watched closely by venture capitalists and for-profit companies. Thus, creative scientists in many countries can

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III. Learning Lessons

This prototype may be a spectacular success. If so, it may be possible to identify similar challenges and funding for additional projects. (For example, it might be possible to survey R&D-oriented industries and secure their financial support for global brownbag projects concerning environment- and energy-related breakthroughs for the future of their businesses - photovoltaics, fuel cells, battery design, reinventing the light bulb, applications of nano- technology to materials science to produce light, super-strong automobiles, etc.) Located eventually at a good institutional home, an “Inventions Wanted . . . “ series could become a program that no scientist (or science-oriented undergraduate or graduate student) would miss.

mention new ideas and use the opportunity, in effect, to advertise for consultantships and research support for their labs. Similarly, there will be a public and permanent record of discussions (before a global audience) that will establish scientific priority. This will create a clear historical record showing which scientist was the first to suggest a new line of investigation, etc. Scientists also can enroll collaborators, worldwide, to pursue their ideas.

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Attachment 1

[from The New York Review of Books. Volume 55, Number 10. June 12, 2008.]

The Question of Global Warming

By Freeman Dyson

A Question of Balance: Weighing the Options on Global Warming Policies

by William Nordhaus

Yale University Press, 234 pp., \$28.00

Global Warming: Looking Beyond Kyoto

edited by Ernesto Zedillo

Yale Center for the Study of Globalization/Brookings Institution Press, 237 pp., \$26.95
(paper)

I begin this review with a prologue, describing the measurements that transformed global warming from a vague theoretical speculation into a precise observational science.

There is a famous graph showing the fraction of carbon dioxide in the atmosphere as it varies month by month and year by year (see the graph). It gives us our firmest and most accurate evidence of effects of human activities on our global environment. The graph is generally known as the Keeling graph because it summarizes the lifework of Charles David Keeling, a professor at the Scripps Institution of Oceanography in La Jolla, California. Keeling measured the carbon dioxide abundance in the atmosphere for forty-seven years, from 1958 until his death in 2005. He designed and built the instruments that made accurate measurements possible. He began making his measurements near the summit of the dormant volcano Mauna Loa on the big island of Hawaii.

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He chose this place for his observatory because the ambient air is far from any continent and is uncontaminated by local human activities or vegetation. The measurements have continued after Keeling's death, and show an unbroken record of rising carbon dioxide abundance extending over fifty years. The graph has two obvious and conspicuous features. First, a steady increase of carbon dioxide with time, beginning at 315 parts per million in 1958 and reaching 385 parts per million in 2008. Second, a regular wiggle showing a yearly cycle of growth and decline of carbon dioxide levels. The maximum happens each year in the Northern Hemisphere spring, the minimum in the Northern Hemisphere fall. The difference between maximum and minimum each year is about six parts per million.

Keeling was a meticulous observer. The accuracy of his measurements has never been challenged, and many other observers have confirmed his results. In the 1970s he extended his observations from Mauna Loa, at latitude 20 north, to eight other stations at various latitudes, from the South Pole at latitude 90 south to Point Barrow on the Arctic coast of Alaska at latitude 71 north. At every latitude there is the same steady growth of carbon dioxide levels, but the size of the annual wiggle varies strongly with latitude. The wiggle is largest at Point Barrow where the difference between maximum and minimum is about fifteen parts per million. At Kerguelen, a Pacific island at latitude 29 south, the wiggle vanishes. At the South Pole the difference between maximum and minimum is about two parts per million, with the maximum in Southern Hemisphere spring.

The only plausible explanation of the annual wiggle and its variation with latitude is that it is due to the seasonal growth and decay of annual vegetation, especially deciduous forests, in temperate latitudes north and south. The asymmetry of the wiggle between north and south is caused by the fact that the Northern Hemisphere has most of the land area and most of the deciduous forests. The wiggle is giving us a direct measurement of the quantity of carbon that is absorbed from the atmosphere each summer north and south by growing vegetation, and returned each winter to the atmosphere by dying and

decaying vegetation.

The quantity is large, as we see directly from the Point Barrow measurements. The wiggle at Point Barrow shows that the net growth of vegetation in the Northern Hemisphere summer absorbs about 4 percent of the total carbon dioxide in the high-latitude atmosphere each year. The total absorption must be larger than the net growth, because the vegetation continues to respire during the summer, and the net growth is equal to total absorption minus respiration. The tropical forests at low latitudes are also absorbing and respiring a large quantity of carbon dioxide, which does not vary much with the season and does not contribute much to the annual wiggle.

When we put together the evidence from the wiggles and the distribution of vegetation over the earth, it turns out that about 8 percent of the carbon dioxide in the atmosphere is absorbed by vegetation and returned to the atmosphere every year. This means that the average lifetime of a molecule of carbon dioxide in the atmosphere, before it is captured by vegetation and afterward released, is about twelve years. This fact, that the exchange of carbon between atmosphere and vegetation is rapid, is of fundamental importance to the long-range future of global warming, as will become clear in what follows. Neither of the books under review mentions it.

1.

William Nordhaus is a professional economist, and his book [A Question of Balance: Weighing the Options on Global Warming Policies](#) describes the global-warming problem as an economist sees it. He is not concerned with the science of global warming or with the detailed estimation of the damage that it may do. He assumes that the science and the damage are specified, and he compares the effectiveness of various policies for the allocation of economic resources in response. His conclusions are largely independent of scientific details. He calculates aggregated expenditures and costs and gains. Everything is calculated by running a single computer model which he calls DICE, an acronym for

Dynamic Integrated Model of Climate and the Economy.

Each run of DICE takes as input a particular policy for allocating expenditures year by year. The allocated resources are spent on subsidizing costly technologies—for example, deep underground sequestration of carbon dioxide produced in power stations—that reduce emissions of carbon dioxide, or placing a tax on activities that produce carbon emissions. The climate model part of DICE calculates the effect of the reduced emissions in reducing damage. The output of DICE then tells us the resulting gains and losses of the world economy year by year. Each run begins at the year 2005 and ends either at 2105 or 2205, giving a picture of the effects of a particular policy over the next one or two hundred years.

The practical unit of economic resources is a trillion inflation-adjusted dollars. An inflation-adjusted dollar means a sum of money, at any future time, with the same purchasing power as a real dollar in 2005. In the following discussion, the word "dollar" will always mean an inflation-adjusted dollar, with a purchasing power that does not vary with time. The difference in outcome between one policy and another is typically several trillion dollars, comparable with the cost of the war in Iraq. This is a game played for high stakes.

Nordhaus's book is not for the casual reader. It is full of graphs and tables of numbers, with an occasional equation to show how the numbers are related. The graphs and tables show how the world economy reacts to the various policy options. To understand these graphs and tables, readers should be familiar with financial statements and compound interest, but they do not need to be experts in economic theory. Anyone who knows enough mathematics to balance a checkbook or complete an income tax return should be able to understand the numbers.

For the benefit of those who are mathematically illiterate or uninterested in numerical

details, Nordhaus has put a nonmathematical chapter at the beginning with the title "Summary for the Concerned Citizen." This first chapter contains an admirably clear summary of his results and their practical consequences, digested so as to be read by busy politicians and ordinary people who may vote the politicians into office. He believes that the most important concern of any policy that aims to address climate change should be how to set the most efficient "carbon price," which he defines as "the market price or penalty that would be paid by those who use fossil fuels and thereby generate CO₂ emissions." He writes:

Whether someone is serious about tackling the global-warming problem can be readily gauged by listening to what he or she says about the carbon price. Suppose you hear a public figure who speaks eloquently of the perils of global warming and proposes that the nation should move urgently to slow climate change. Suppose that person proposes regulating the fuel efficiency of cars, or requiring high-efficiency lightbulbs, or subsidizing ethanol, or providing research support for solar power—but nowhere does the proposal raise the price of carbon. You should conclude that the proposal is not really serious and does not recognize the central economic message about how to slow climate change. To a first approximation, raising the price of carbon is a necessary and sufficient step for tackling global warming. The rest is at best rhetoric and may actually be harmful in inducing economic inefficiencies.

If this chapter were widely read, the public understanding of global warming and possible responses to it would be greatly improved.

Nordhaus examines five kinds of global-warming policy, with many runs of DICE for each kind. The first kind is business-as-usual, with no restriction of carbon dioxide emissions—in which case, he estimates damages to the environment amounting to some \$23 trillion in current dollars by the year 2100. The second kind is the "optimal policy," judged by Nordhaus to be the most cost-effective, with a worldwide tax on carbon

emissions adjusted each year to give the maximum aggregate economic gain as calculated by DICE. The third kind is the Kyoto Protocol, in operation since 2005 with 175 participating countries, imposing fixed limits to the emissions of economically developed countries only. Nordhaus tests various versions of the Kyoto Protocol, with or without the participation of the United States.

The fourth kind of policy is labeled "ambitious" proposals, with two versions which Nordhaus calls "Stern" and "Gore." "Stern" is the policy advocated by Sir Nicholas Stern in the Stern Review, an economic analysis of global-warming policy sponsored by the British government.[*] "Stern" imposes draconian limits on emissions, similar to the Kyoto limits but much stronger. "Gore" is a policy advocated by Al Gore, with emissions reduced drastically but gradually, the reductions reaching 90 percent of current levels before the year 2050. The fifth and last kind is called "low-cost backstop," a policy based on a hypothetical low-cost technology for removing carbon dioxide from the atmosphere, or for producing energy without carbon dioxide emission, assuming that such a technology will become available at some specified future date. According to Nordhaus, this technology might include "low-cost solar power, geothermal energy, some nonintrusive climatic engineering, or genetically engineered carbon-eating trees."

Since each policy put through DICE is allowed to run for one or two hundred years, its economic effectiveness must be measured by an aggregated sum of gains and losses over the whole duration of the run. The most crucial question facing the policymaker is then how to compare present-day gains and losses with gains and losses a hundred years in the future. That is why Nordhaus chose "A Question of Balance" for his title. If we can save M dollars of damage caused by climate change in the year 2110 by spending one dollar on reducing emissions in the year 2010, how large must M be to make the spending worthwhile? Or, as economists might put it, how much can future losses from climate change be diminished or "discounted" by money invested in reducing emissions now?

The conventional answer given by economists to this question is to say that M must be larger than the expected return in 2110 if the 2010 dollar were invested in the world economy for a hundred years at an average rate of compound interest. For example, the value of one dollar invested at an average interest rate of 4 percent for a period of one hundred years would be fifty-four dollars; this would be the future value of one dollar in one hundred years' time. Therefore, for every dollar spent now on a particular strategy to fight global warming, the investment must reduce the damage caused by warming by an amount that exceeds fifty-four dollars in one hundred years' time to accrue a positive economic benefit to society. If a strategy of a tax on carbon emissions results in a return of only forty-four dollars per dollar invested, the benefits of adopting the strategy will be outweighed by the costs of paying for it. But if the strategy produces a return of sixty-four dollars per dollar invested, the advantages are clear. The question then is how well different strategies of dealing with global warming succeed in producing long-term benefits that outweigh their present costs. The aggregation of gains and losses over time should be calculated with the remote future heavily discounted.

The choice of discount rate for the future is the most important decision for anyone making long-range plans. The discount rate is the assumed annual percentage loss in present value of a future dollar as it moves further into the future. The DICE program allows the discount rate to be chosen arbitrarily, but Nordhaus displays the results only for a discount rate of 4 percent. Here he is following the conventional wisdom of economists. Four percent is a conservative number, based on an average of past experience in good and bad times. Nordhaus is basing his judgment on the assumption that the next hundred years will bring to the world economy a mixture of stagnation and prosperity, with overall average growth continuing at the same rate that we have experienced during the twentieth century. Future costs are discounted because the future world will be richer and better able to afford them. Future benefits are discounted because they will be a diminishing fraction of future wealth.

When the future costs and benefits are discounted at a rate of 4 percent per year, the aggregated costs and benefits of a climate policy over the entire future are finite. The costs and benefits beyond a hundred years make little difference to the calculated aggregate. Nordhaus therefore takes the aggregate benefit-minus-cost over the entire future as a measure of the net value of the policy. He uses this single number, calculated with the DICE model of the world economy, as a figure of merit to compare one policy with another. To represent the value of a policy by a single number is a gross oversimplification of the real world, but it helps to concentrate our attention on the most important differences between policies.

Here are the net values of the various policies as calculated by the DICE model. The values are calculated as differences from the business-as-usual model, without any emission controls. A plus value means that the policy is better than business-as-usual, with the reduction of damage due to climate change exceeding the cost of controls. A minus value means that the policy is worse than business-as-usual, with costs exceeding the reduction of damage. The unit of value is \$1 trillion, and the values are specified to the nearest trillion. The net value of the optimal program, a global carbon tax increasing gradually with time, is plus three—that is, a benefit of some \$3 trillion. The Kyoto Protocol has a value of plus one with US participation, zero without US participation. The "Stern" policy has a value of minus fifteen, the "Gore" policy minus twenty-one, and "low-cost backstop" plus seventeen.

What do these numbers mean? \$1 trillion is a difficult unit to visualize. It is easier to think of it as \$3,000 for every man, woman, and child in the US population. It is comparable to the annual gross domestic product of India or Brazil. A gain or loss of \$1 trillion would be a noticeable but not overwhelming perturbation of the world economy. A gain or loss of \$10 trillion would be a major perturbation with unpredictable consequences.

The main conclusion of the Nordhaus analysis is that the ambitious proposals, "Stern" and "Gore," are disastrously expensive, the "low-cost backstop" is enormously advantageous if it can be achieved, and the other policies including business-as-usual and Kyoto are only moderately worse than the optimal policy. The practical consequence for global-warming policy is that we should pursue the following objectives in order of priority. (1) Avoid the ambitious proposals. (2) Develop the science and technology for a low-cost backstop. (3) Negotiate an international treaty coming as close as possible to the optimal policy, in case the low-cost backstop fails. (4) Avoid an international treaty making the Kyoto Protocol policy permanent. These objectives are valid for economic reasons, independent of the scientific details of global warming.

There is a fundamental difference of philosophy between Nordhaus and Sir Nicholas Stern. Chapter 9 of Nordhaus's book explains the difference, and explains why Stern advocates a policy that Nordhaus considers disastrous. Stern rejects the idea of discounting future costs and benefits when they are compared with present costs and benefits. Nordhaus, following the normal practice of economists and business executives, considers discounting to be necessary for reaching any reasonable balance between present and future. In Stern's view, discounting is unethical because it discriminates between present and future generations. That is, Stern believes that discounting imposes excessive burdens on future generations. In Nordhaus's view, discounting is fair because a dollar saved by the present generation becomes fifty-four dollars to be spent by our descendants a hundred years later.

The practical consequence of the Stern policy would be to slow down the economic growth of China now in order to reduce damage from climate change a hundred years later. Several generations of Chinese citizens would be impoverished to make their descendants only slightly richer. According to Nordhaus, the slowing-down of growth would in the end be far more costly to China than the climatic damage. About the much-discussed possibility of catastrophic effects before the end of the century from

rising sea levels, he says only that "climate change is unlikely to be catastrophic in the near term, but it has the potential for serious damages in the long run." The Chinese government firmly rejects the Stern philosophy, while the British government enthusiastically embraces it. The Stern Review, according to Nordhaus, "takes the lofty vantage point of the world social planner, perhaps stoking the dying embers of the British Empire."

2.

The main deficiency of Nordhaus's book is that he does not discuss the details of the "low-cost backstop" that might provide a climate policy vastly more profitable than his optimum policy. He avoids this subject because he is an economist and not a scientist. He does not wish to question the pronouncements of the Intergovernmental Panel on Climate Change, a group of hundreds of scientists officially appointed by the United Nations to give scientific advice to governments. The Intergovernmental Panel considers the science of climate change to be settled, and does not believe in low-cost backstops. Concerning the possible candidates for a low-cost backstop technology he mentions in the sentence I previously quoted—for example, "low-cost solar power"—Nordhaus has little to say. He writes that "no such technology presently exists, and we can only speculate on it." The "low-cost backstop" policy is displayed in his tables as an abstract possibility without any details. It is nowhere emphasized as a practical solution to the problem of climate change.

At this point I return to the Keeling graph, which demonstrates the strong coupling between atmosphere and plants. The wiggles in the graph show us that every carbon dioxide molecule in the atmosphere is incorporated in a plant within a time of the order of twelve years. Therefore, if we can control what the plants do with the carbon, the fate of the carbon in the atmosphere is in our hands. That is what Nordhaus meant when he mentioned "genetically engineered carbon-eating trees" as a low-cost backstop to global warming. The science and technology of genetic engineering are not yet ripe for large-scale use. We do not understand the language of the genome well enough to read

and write it fluently. But the science is advancing rapidly, and the technology of reading and writing genomes is advancing even more rapidly. I consider it likely that we shall have "genetically engineered carbon-eating trees" within twenty years, and almost certainly within fifty years.

Carbon-eating trees could convert most of the carbon that they absorb from the atmosphere into some chemically stable form and bury it underground. Or they could convert the carbon into liquid fuels and other useful chemicals. Biotechnology is enormously powerful, capable of burying or transforming any molecule of carbon dioxide that comes into its grasp. Keeling's wiggles prove that a big fraction of the carbon dioxide in the atmosphere comes within the grasp of biotechnology every decade. If one quarter of the world's forests were replanted with carbon-eating varieties of the same species, the forests would be preserved as ecological resources and as habitats for wildlife, and the carbon dioxide in the atmosphere would be reduced by half in about fifty years.

It is likely that biotechnology will dominate our lives and our economic activities during the second half of the twenty-first century, just as computer technology dominated our lives and our economy during the second half of the twentieth. Biotechnology could be a great equalizer, spreading wealth over the world wherever there is land and air and water and sunlight. This has nothing to do with the misguided efforts that are now being made to reduce carbon emissions by growing corn and converting it into ethanol fuel. The ethanol program fails to reduce emissions and incidentally hurts poor people all over the world by raising the price of food. After we have mastered biotechnology, the rules of the climate game will be radically changed. In a world economy based on biotechnology, some low-cost and environmentally benign backstop to carbon emissions is likely to become a reality.

Global Warming: Looking Beyond Kyoto is the record of a conference held at the Yale Center for the Study of Globalization in 2005. It is edited by Ernesto Zedillo, the head of

the Yale Center, who served as president of Mexico from 1994 to 2000 and was chairman of the conference. The book consists of an introduction by Zedillo and fourteen chapters contributed by speakers at the conference. Among the speakers was William Nordhaus, contributing "Economic Analyses of the Kyoto Protocol: Is There Life After Kyoto?," a sharper criticism of the Kyoto Protocol than we find in his own book.

The Zedillo book covers a much wider range of topics and opinions than the Nordhaus book, and is addressed to a wider circle of readers. It includes "Is the Global Warming Alarm Founded on Fact?," by Richard Lindzen, professor of atmospheric sciences at MIT, answering that question with a resounding no. Lindzen does not deny the existence of global warming, but considers the predictions of its harmful effects to be grossly exaggerated. He writes,

Actual observations suggest that the sensitivity of the real climate is much less than that found in computer models whose sensitivity depends on processes that are clearly misrepresented.

Answering Lindzen in the next chapter, "Anthropogenic Climate Change: Revisiting the Facts," is Stefan Rahmstorf, professor of physics of the oceans at Potsdam University in Germany. Rahmstorf sums up his opinion of Lindzen's arguments in one sentence: "All this seems completely out of touch with the world of climate science as I know it and, to be frank, simply ludicrous." These two chapters give the reader a sad picture of climate science. Rahmstorf represents the majority of scientists who believe fervently that global warming is a grave danger. Lindzen represents the small minority who are skeptical. Their conversation is a dialogue of the deaf. The majority responds to the minority with open contempt.

In the history of science it has often happened that the majority was wrong and refused to listen to a minority that later turned out to be right. It may—or may not—be that the

present is such a time. The great virtue of Nordhaus's economic analysis is that it remains valid whether the majority view is right or wrong. Nordhaus's optimum policy takes both possibilities into account. Zedillo in his introduction summarizes the arguments of each contributor in turn. He maintains the neutrality appropriate to a conference chairman, and gives equal space to Lindzen and to Rahmstorf. He betrays his own opinion only in a single sentence with a short parenthesis: "Climate change may not be the world's most pressing problem (as I am convinced it is not), but it could still prove to be the most complex challenge the world has ever faced."

The last five chapters of the Zedillo book are by writers from five of the countries most concerned with the politics of global warming: Russia, Britain, Canada, India, and China. Each of the five authors has been responsible for giving technical advice to a government, and each of them gives us a statement of that government's policy. Howard Dalton, spokesman for the British government, is the most dogmatic. His final paragraph begins:

It is the firm view of the United Kingdom that climate change constitutes a major threat to the environment and human society, that urgent action is needed now across the world to avert that threat, and that the developed world needs to show leadership in tackling climate change.

The United Kingdom has made up its mind and takes the view that any individuals who disagree with government policy should be ignored. This dogmatic tone is also adopted by the Royal Society, the British equivalent of the US National Academy of Sciences. The Royal Society recently published a pamphlet addressed to the general public with the title "Climate Change Controversies: A Simple Guide." The pamphlet says:

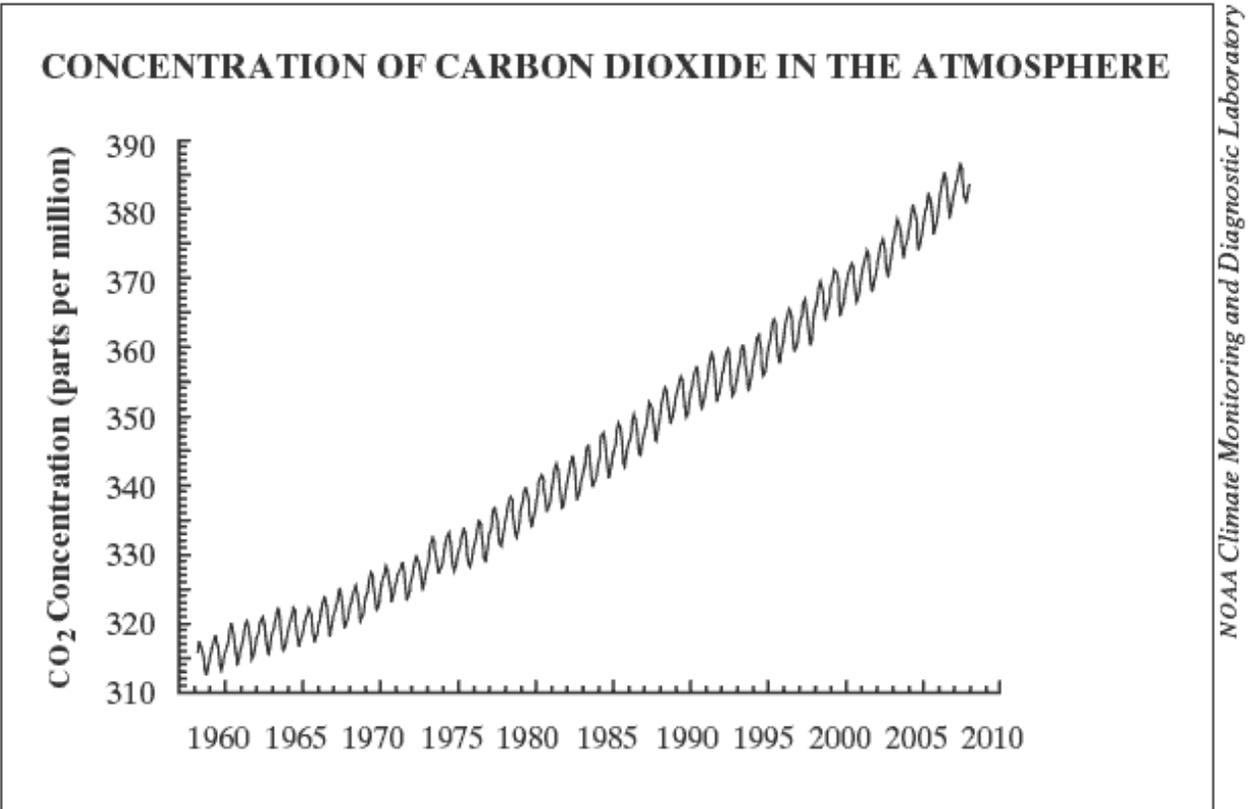
This is not intended to provide exhaustive answers to every contentious argument that has been put forward by those who seek to distort and undermine the science of climate change and deny the seriousness of the potential consequences of global warming.

In other words, if you disagree with the majority opinion about global warming, you are an enemy of science. The authors of the pamphlet appear to have forgotten the ancient motto of the Royal Society, *Nullius in Verba*, which means, "Nobody's word is final."

All the books that I have seen about the science and economics of global warming, including the two books under review, miss the main point. The main point is religious rather than scientific. There is a worldwide secular religion which we may call environmentalism, holding that we are stewards of the earth, that despoiling the planet with waste products of our luxurious living is a sin, and that the path of righteousness is to live as frugally as possible. The ethics of environmentalism are being taught to children in kindergartens, schools, and colleges all over the world.

Environmentalism has replaced socialism as the leading secular religion. And the ethics of environmentalism are fundamentally sound. Scientists and economists can agree with Buddhist monks and Christian activists that ruthless destruction of natural habitats is evil and careful preservation of birds and butterflies is good. The worldwide community of environmentalists—most of whom are not scientists—holds the moral high ground, and is guiding human societies toward a hopeful future. Environmentalism, as a religion of hope and respect for nature, is here to stay. This is a religion that we can all share, whether or not we believe that global warming is harmful.

Unfortunately, some members of the environmental movement have also adopted as an article of faith the belief that global warming is the greatest threat to the ecology of our planet. That is one reason why the arguments about global warming have become bitter and passionate. Much of the public has come to believe that anyone who is skeptical about the dangers of global warming is an enemy of the environment. The skeptics now have the difficult task of convincing the public that the opposite is true. Many of the skeptics are passionate environmentalists. They are horrified to see the obsession with global warming distracting public attention from what they see as more serious and more



A graph showing rising concentrations of carbon dioxide in the atmosphere, based on the measurements of the scientist Charles David Keeling at Mauna Loa, Hawaii. As Freeman Dyson explains, the wiggle in the graph gives us 'a direct measurement of the quantity of carbon that is absorbed from the atmosphere each summer north and south by growing vegetation, and returned each winter to the atmosphere by dying and decaying vegetation.'
The fact 'that the exchange of carbon between atmosphere and vegetation is rapid is of fundamental importance to the long-range future of global warming.'

immediate dangers to the planet, including problems of nuclear weaponry, environmental degradation, and social injustice. Whether they turn out to be right or wrong, their arguments on these issues deserve to be heard.

Notes

[*] See Nicholas Stern, The Economics of Climate Change: The Stern Review (Cambridge University Press, 2007).

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RadhaKrishnan, Chair., SPACE, INDIA.

From: "Devalraju Rambabu" [REDACTED]
Date: Mon, October 20, 2014 2:45 am
To: "pcast@ostp.gov" <pcast@ostp.gov>

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A PATH BREAKER and rejuvenator for and of current day Indian SCIENCE ; 2014 year

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CERN findings and my review 26092011: :

This paper is dedicated to the efforts of ANNA HAZARE OF INDIA , WHO VERY RECENTLY REVIVED THE VERY CONCEPT OF GANDHIAN METHOD IN CURRENT DAY POLITICAL CLIMATE IN INDIA OF NATIVE ORIGIN, WHICH GANDHI WAS PRAISED BY Prof. ALBERT EINSTEIN IN HIS DAYS AS VERY SIGNIFICANT TO HIS ONE OF OBSERVATIONS.

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"When an experiment finds an "apparently unbelievable result" and can find no artefact of the measurement to account for it, it's normal procedure to invite broader scrutiny, and this is exactly what the OPERA collaboration is doing, it's good scientific practice," said CERN Research Director Sergio Bertolucci. "If this measurement is confirmed, it might change ..."

OUR ANCESTRAL LINK ::

"TURNER and FAYD"

On "agglomeration of POWDERED PARTICLES IN OUTER SPACE ;

IN CONTEXT WITH GAS - SOLID FLUIDIZED BEDS OF FINE PARTICLES and THE thoroughly eluded PHENOMENA of particle agglomeration and other INTER—PARTCLE FORCES FOR MORE THAN 50 years of GAS—SOLID FLUIDIZED BEDS RESEARCH INTERNATIONALLY SPEAKING. [before 1984 year]

1. Dr. John GRACE's DIRECTION TO ME in the year 1983—1984 : DO and KEEP TRYING ' WHAT ever is HUMANLY POSSIBLE. ' ;
2. MY OWN EXTENSION INTO THE AXIOMATIC WORLD : (Please refer to the later years SUPPORT PUBLICATION of MINE ON THE VERIFICATION of Prof. ALBERT EINSTEIN's THEORY of RELETIVITY AT THE GRAND PHYSISIST's WORK PLACE, CERN [EUROPEAN] .

DETAILS ON WORK DONE AT THE UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER, BC., CANADA.

1. Bed collapse experimental investigations in a 2-Dimensional High Pressure Fluidized Bed of Fine Particles (less than 200 mesh size) at High pressures to determine the gas flow distribution between bubble and emulsion phases:
The recent observation of gas-solid fluidized beds with fine particles in giving lesser bubble flow rates has attracted the attention of many from the point of view of improved gas-solid contacting for catalytic and non-catalytic applications. High pressures further improve the situation and favor kinetics in some cases.
Experimental data is collected on dense phase gas flow behavior in a high-pressure 2-dimensional cell designed and constructed to withstand pressures upto 300 psig.
The gas flow patterns at high pressures are visually observed and the role of bed pressure assessed. "Bed Collapse experiments" have been conducted wherein gas flow to the well-fluidized bed is suddenly cut off and the decrease in bed height has been recorded using a sony-betamax Video camera.
Certain new phenomena pertaining to the role of interparticle forces in altering the gas flow rates in the dense phase of the bed has been observed and experiments were conducted to confirm this phenomena. The Phenomena, new to almost 50 years of earlier basic research on fluidized beds gives a depth of understanding to the bed gas flow behavior especially at high pressures and fine particles as the fluidizing material.
2. Mathematical Model formulated in relation to high pressure fluidized Bed Coal combustion for checking the effect and role of various process parameters on final coal conversion (combustion) with the bed constituted by char particles.
The large scale effort currently underway in using fluidized bed combustors and boilers for power production, gives rise to an immediate need for detailed modeling of the reactor to make predictions on combustion efficiencies and CO, SO2 and NOX emissions.
A model is formulated incorporating the bubble hydrodynamics and kinetics peculiar to the combustion reactions involving large particles at high pressures. Computer calculations are required to check the model. Extension of the model to a more elaborate version is under active consideration.

Here the work involved is a literature survey of mathematical expressions proposed by different workers for any process parameter, selection of the most suitable equation/equations and incorporating these parameter values into a set of differential equations that define the gas flow patterns in a fluidized bed. SMILE Services, Ashok Nagar, Hyderabad, A.P., India & Seelamvari Street, Bapatla, Guntur Dt., A.P., India.

MAJOR WORKs DURING LAST 15 to 20 YEARS WHICH BEST ILLUSTRATES OUR QUALIFICATIONS

- - - D.RAMBABU

1. A HIGH INVESTMENT AND HIGH TECHNOLOGY EXPORT ORIENTED INDUSTRIAL AND BUSINESS PROJECT INDIA VENTURE YET IN THE POOR MAN'S DOMAIN.
- - - PROJECT LOCATION WITHIN INDIA: NO. OF STAFF: 1. International POSSIBLE LOCATIONS : ANDHRA PRADESH, KERALA, THAILAND and/or TAMIL NADU; (Project Outlines are formulated. Further Progress is CURRENTLY WITHHELD.);
2. Tele—DOCTOR : Please refer to the PAMPHLET IN CONNECTION;
3. FEASIBILITY SCIENCE for INVESTMENT and/or TECHNOLOGY and/or HUMAN EFFORT RICH WORKS either MANUAL or INFO. Tech. RICH.;
4. RADIO-NET-OLGY , A FUTURE INTO THE INTERNET DELIVERED RADIOLOGICAL [radiation in it's FULLY LOADED MEANING and INTERPRETATION] SCIENCES INTO THE PRACTICAL WORLD of patient side RICH RADIOLOGICAL REMEDIES ; WILL THE NET TAKE OFF TO THE OUTER SKIES or WILL IT BE JUST LIMITED TO THE UNDER SEA CABLES OFTEN TUGGED AWAY BY THE FERRIES ???
5. OVERVIEW FIRST TIME DETAILS OF RECOMMENDED PILOT PROJECT OF CHILDREN'S COMPUTER EDUCATION;
6. AGRO-INDUSTRY AND FOOD PROCESSING ON PAR WITH AGRICULTURE;
7. ---: A "MARKETING RELEVANCY EVALUATION" ON INDIAN ECONOMY :-:-;
8. SOCIETY, THE INFO and knowledge revolution, role of SCIENCE & TECHNOLOGY AND limitations of LAW. - - - D.RAMBABU (Studied for Master of Applied Science, British Columbia University, Vancouver, B.C., CANADA, 1981 - '84 [Chemical Engineering, Computer Software and Master of Business Administration 'Marketing Management']);<http://www.Medi-e-HEALTHCARE.0catch.com>; proj015BaB@gmail.com ; rambabu_d2004@yahoo.co.in ; MY IMMEDIATE ENGAGEMENT IS WITH " BUSINESS ANALYSIS at a DIRECTOR's work, MODE and SCRUTINY level of OPERATIONS. For INSTANCE, WHAT is this and WHERE is THIS ??? --- IT_PMO_Director_Business_Analysis_id_(March2011).pdf on PMED

TATA CHEMICALS LIMITED
MITHAPUR, OHANGWAL, GUJARAT 385
Regd. Office: Bombay House, 24 Hornby Street, Fort, MUMBAI - 400 001.
GRAM : TATAKEMI-MITHAPUR, PHONE : 02892-22207/22229, FAX : 02892-22227.

TCL being one of the biggest Heavy Chemicals Industries in India and having done and explored Pioneering works in Basic Engg. & Process Control in mainly conventional Soda Ash sector and other Salt based products such as Bromine-Bromides, Chlor-Alkali etc., he was found a very suitable candidate for our operations.

Mr. Rambabu was mainly assigned to design a suitable Heat exchanger as a Cooler come Crystallizer, conduct relevant Hydraulic Studies on Slurry Application for Piping & Pumps and ultimately to design Optimum & Critical piping diameter for Soda-slurry application. In his six months tenure, he has participated in Quality Control System & Procedure, which has recently been implemented under ISO 9001 in our R & D Division. He has also run the newly installed Pilot Plant to manufacture Sodium Sesquicarbonate. All the test results and analysis pertaining to the plant, he has implemented successfully. In his 6 months experience, he has familiarized himself with International Standards and Codes.

Mr. Rambabu is found to be a very versatile & experienced engineer.

(S.K.Madhurao)
Senior Superintendent-Chem. Engg.

मार्केटिंग अथवा
व्यापारिक उद्देश्य
के लिए नहीं है।



'Generic Medicines' (as against 'BRAND MANUFACTURED' medicines) are reasonably priced, as compared to the prices of their equivalent medicines ['COMPANY BRAND' MANUFACTURED] in most countries; and so THEY MITIGATE THE PLIGHT of, a large population of poor people in our country INDIA, WHO find it difficult to afford the more expensive branded category of medicines. [HAVE YOU EVER WITNESSED THE FIGHT BETWEEN SHOP and VILLAGER AT NIMS, PUNJAGUTTA, HYDERABAD, OVER Rs. 6/- / 5/- per strip of RANITIDINE ???]. Accordingly, 'ensuring availability of quality medicines at affordable prices to all', has been a key objective of the Government.

Jan Aushadhi --- The Idea ---

A Bureau of Pharma PSUs of India (BPPI) has been established on the 1st of December 2008 comprising all the Pharma CPSUs under the Department of Pharmaceuticals. The Bureau will bring about effective collaboration and cooperation in furthering the working and resources of these organizations. More specifically it would : Co-ordinate marketing of the generic drugs through the Jan Aushadhi stores.

1. OUR VERY RECENT VIABLE DECISION IN THIS REGARD is, THE PATIENT SIDE "USER" FORM WE USE FOR MEDICAL CASE INITIATION [it is a legal size LANDSCAPE ORIENTED FORM, THAT HAS TO BE FILLED BY THE "PATIENT SIDE" WITH A SIGNATURE , SCANNED and TO BE SENT TO US.];
2. The next STEP VIABLE DECISION WE are IMMEDIATELY ON FAST WORK is; THIS ALL PURPOSE SINGLE FORM MAY COVER more than 350 medicines under GENERIC;
3. THUS, THE MAHATMA's DREAMS WILL AT LEAST BE PARTLY MET WITH.
4. <http://www.medi-e-healthcare.0catch.com/> IS NOT ANY COMPANY AT ALL. IT IS through a JUDGMENTAL ACT of the by gone days;
5. UNLESS OUR CHIEF EXECUTIVE HIMSELF MOVES OUT TO U.S.A. FOR AN EMPLOYMENT POSITION and route back the earned CASH for AT LEAST THIS WORK, WE ARE VIRTUALLY DEPLETED IN CASH and KIND;
6. **Testimonials** : On Tuesday, 17 June 2014 7:59 PM, Dawn Van Dam <dawn@onemillionsolutionsinhealth.net> wrote : Hi, (for An exclusive webinar hosted by One Million Solutions in Health™) You are invited to join us for this exclusive, complimentary webinar entitled "The Need for Several Types of FDA Reforms -- And Tools to Implement Them". - - - As former 2nd-in-Command at the US FDA, Dr. John Norris' thesis is that today's FDA is overdue for another set of major reforms in key, fairly distinct areas. Learn about his ideas via this webinar. - - - Dawn Van Dam, President and CEO
7. I STAY HERE at HYDERABAD of ANDHRA PRADESH, INDIA as on a CAMP OFFICE (BASIS) and so, my VERY NEARNESS to local INTERNET CENTERS PRECLUDE me FROM INVESTING on PERSONAL GADGETRY.
8. So, excluding these WEBINARS which fall around 12. p.m. IST, other ways of COMMUNICATION WITH and INVOLVEMENT of me ON THE SAME, WILL BE AS USUAL and so are welcome.

<http://www.medi-e-healthcare.0catch.com/>

Thanking you,

<http://www.medi-e-healthcare.0catch.com/> proj015BaB@gmail.com

Wolters Kluwer Health | Medknow To Me 05012014 at 12:18 AM //// - - - **Medknow | Copyright © 2014 All rights reserved..**

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LOW COST MEDICATION PRESCRIPTION also via INTERNET;

The so called Tele - MEDICINE but WITHOUT DISTANCE BORDERS

Jwala & Dr Sridhar Rao

<http://www.medi-e-healthcare.0catch.com/>

07.02.2014

मार्केटिंग अथवा
व्यापारिक उद्देश्य
के लिए नहीं है।



Federation of
Indian Chambers
of Commerce and Industry

Federation House
Tansen Marg
New Delhi 110001
T +91 11 23738760 (11 lines)
F +91 11 23320714 / 237215047
E ficci@ficci.com
www.ficci.com

To: proj015bab@gmail.com

Nirankar Saxena Sr. Director, S&T/Innovation October 10, 2014

Dear Sir / Madam,

'Global R&D Summit 2014', November 12-13, 2014, The Lalit, New Delhi.

Greetings from FICCI!

It is my pleasure to inform you that FICCI is organising a two-day international R&D conference and exhibition titled 'GLOBAL R&D SUMMIT 2014: Next-Gen Innovations Through Interdisciplinary Research' to be held on **November 12-13, 2014** at **The Lalit, New Delhi**. (www.ficciindsummit.com)

The event aims to be a magnanimous milieu of experts from public and private research institutions, academia, industry and international agencies that constitutes the global R&D ecosystem. It will also render a high level networking ground for people to connect, collaborate and create new partnerships, refresh existing ones and showcase some of their demonstrated success stories in R&D.

The exhibition to be organized along side the summit will house and showcase some of the most innovative and successful R&D projects, programs and initiatives from government, industry and academia and will offer a high-level networking and business opportunity platform for participants.

Keeping in tune with India's priority areas for R&D investment, the event will focus on areas such as - **Aerospace, Telecom, Energy, Defence, Infrastructure, Healthcare, Pharma & Designs**. The summit will be attended by a large number of delegates from India and abroad. Expert presentations on above mentioned topics would give an impetus to the proceedings. It will be a great networking opportunity for interaction, exchange of views on the global concerns and to bring out implementable recommendations.

Considering the strategic role of your esteemed organisation in the R&D and innovation ecosystem of the country and its growing dominance in frontier areas of cutting-edge technology development. **We would encourage you to participate as an esteemed 'Delegate'** of this summit (click here to download brochure).

A copy of the **draft program** and the **registration performa** is attached for your kind perusal and consideration (click on the hyperlink to download).

Looking forward to your kind consideration.

With best regards, Yours sincerely,

(Nirankar Saxena)

Industry's Voice for Policy Change

CIN: U99999DL1956NPL002635 -- Click Here to unsubscribe from this newsletter.

I. **MY RESPONSE from : Dt : 10132014.**

1. proj015bab@gmail.com ;
 2. rambabu_d2004@yahoo.co.in ;
 3. <http://www.medi-e-healthcare.0catch.com/> ;
 4. C/o Sri SRINIVASULU [MILK SHOP], +919246541225 ; RESIDENCE;
 5. Mr. SHIVA, CALL CENTER OWNER, Shop No. : 8, FLOOR and OFFICE ALSO, above mee Seva CENTER, 5-1-121/2, "PARAMARTHA IT Solutions", AREA and LOCATION, OPPOSITE 'JANA PRIYA' BUS STOP[Adjacent STOP to Siva HOTEL], MALLAPUR on the HABSIGUDA – ECIL CROSS ROADS HIGHWAY, HYDERABAD – 76, ANDHRA PRADESH, INDIA; 'CURRENT WORK OFFICE'; +919676864300;
 6. Mr. D. V. ANJANEYULU, +919392325629 ; own BROTHER, FINANCIALLY and hitherto PARTLY SUPPORTING MY OLD AGE GET ON;
1. **ALL through MY LIFE HITHERTO, IT IS A GREAT INTEREST and INVOLVEMENT IN Science, TECHNOLOGY and INNOVATION ;**
 2. **Mr. Nirankar Saxena Sr. Director, S&T/Innovation himself is a GREAT PERSONALITY WITH ENTHUSIASM and but for the severe cyclonic storm ON THE COAST of EAST GODAVARI DISTRICT of ANDHRA PRADESH LAST year, we should have already been working on a GREAT industrial & AGRICULTURAL STARTUP ; THANKS TO THE MILLINIUM INDO – AMERICAN COOPERATION and in PARTICULAR the INTEREST vested in Dr. HOLDREN, OFFICE of Science & Technology Policy, President OBAMA ADMINISTRATION, THE WHITE HOUSE, U.S.A.;**
 3. **I AM, SO FAR, ONLY A PROFESSIONAL VENTURER, business like, with almost zero startup cash in hand, never so far reaching the posture OF A COMPANY UNDER THE COMPANYS ACT OF INDIA;**
 4. **NOTHING IS HOWEVER LOST AS YOU ALL CAN SEE FROM THE SOME OF MY RESEARCH WORKS ON A OPEN CHANNEL PUBLICATION ROUTE OF MINE;**
 5. **SO, AVOIDING THE BOTTLENECKS AND PITFALLS OF THE 'MADAN MOHIC ERA' OF THE INDIAN ECONOMIC EMBROGLIO ALL THROUGH THE YEARS : 1984- 2014 HAS BEEN MY MOST PRIMARY, URGENT AND UTTER INVOLVEMENT, BY THE GRACE OF ONLY THE PROVIDENCE I REACHED AT LEAST A COUNTABLE LIST OF ACCOUNTABLES IN RELATION TO SCIENCE & TECHNOLOGY ;**
 6. **MY IMMEDIATE ENGAGEMENT IS WITH " BUSINESS ANALYSIS at a DIRECTOR's work, MODE and SCRUTINY level of OPERATIONS. For INSTANCE, WHAT is this and WHERE is THIS ??? --- IT_PMO_Director_Business_Analysis_jd_(March2011).pdf on PMED**
 7. **So, all said, are there any sponsors for my participation into the current event, from all sorts of FINANCIAL ANGLES ? - - - Thanking you, Sincerely yours, D. Rambabu**

CURRENTLY FUNCTIONING IN COMPLEX BUSINESS and SCIENCE & TECHNOLOGY DOMAINS OF ACTIVITY WITH EMPHASIS ON PROJECTS & RESEARCH.

A ONE TIME MEMBER OF AN INTERNATIONAL RESEARCH GROUP HEADED BY A FORMER DIRECTOR OF UNITED NATIONS RESEARCH, Dr. ERWIN LASZLO, VIENNA, AUSTRIA.

In addition to this SALARY FETCHING EXTERNAL ORGANIZATIONAL WORK , Work as Chief Executive & Advisor, SMILE Services (Services Management Interactive Legal & Engineering) over a period of more than 15 years in functional areas of Research & Development, Projects Formulation and Implementation Workout, General Management and Marketing Management.

1. This is a COMPOSITE WORK SCHEME projected into "RESULTS AZENDA of CERTAIN HIGHER ORDER R&D : **Next-Gen Innovations Through Interdisciplinary Research** inclusive of fine CHEMICALS, Pharmaceuticals, HEALTHCARE, Computer SOFTWARE and **PROJECT MANAGEMENT**; as well as LAW, COMPLIANCE [MAINLY REGULATORY] and OVERALL MANAGEMENT and ADMINISTRATION.
2. **EQUIVALENCE** IS THE WATCH WORD FOR THE SELECTION PURPOSES and the matter HAS TO BE 'a priori' TAKEN UP WITH THE CONCERNED GOVERNMENTAL BODIES.
3. MY UNDERSTANDING IS THAT WITH OVERALL **EQUIVALENT KNOWLEDGE** inclusive of some '**R & D FRONTLINES**', MY '**MANAGEMENT**' BACKGROUND and SKILLS are EVEN SURPASSING THE REQUIRED COMPETANCY LEVEL FOR A '**DIRECTOR**' DESIGNATION IN EACH ONE OF THE DOMAIN ACTIVITY THUS PROJECTED HERE ...

#####

"Gilliot Bernard, President of ORI" ;;; DEVALRAJU RAMBABU

The selection of consultants based on the lowest price results in a lower quality of the delivered work. Design costs are generally only a small percentage of the total project cost. Cost savings just on that can lead to "unnecessarily high lifecycle costs later in the project".

" The allocation based on lowest price hinders innovation. The value of a project ultimately depends on the quality of design and expertise of the project."

"As an engineering consultancy company, we face the problem of access from an economic and ecological point of view and try to suggest solutions through innovation. This is the best guarantee for the future and further development of our business."

Projects must be approached from all possible angles.

The current projects require a fully integrated approach in the context of a sustainable concept.

"The engineering consultancy is a privileged partner of the link between investors and developers. It is an inventive and rational approach to providing efficient solutions to achieve the client to achieve. They will have a competitive infrastructure," says Bernard Gilliot. "We must work together with experts from different disciplines to their expertise to integrate and use in our business. With imagination and creativity. The new integrated method in which the engineering firm acts as a translator and an integrator of other scientific branches, and expertise, gives everyone benefits."

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

cells : C/o VEERU : +91-9392325629; C/o Sheik Muzeer : +91-9966711977

study of certain Software Modules, Executive Trained in Manpower Planning (NITIE, Mumbai), Self Studied and Experienced in LAW, General Management and Marketing Management (THE LATER ALSO WITH AN YEAR CANADIAN UNIVERSITY M.B.A COURSE), Internet Trained in ISO9001:2000 (including Quality Control Systems and Procedures), Validation (including cGMP, TGA and Computer Systems in Pharma..) and ANDA Submission to USFDA (Pharmaceutical), Project Management, Appraisal and Evaluation, CMM Quality Models for Computer Software and Software Testing and Validation Methodology, Total Quality Management (TQM), Quality Function Deployment (QFD), Critical Supply Chain Management (CSCM), Statistical Quality Control, Six Sigma for Quality and People-CMM (P-CMM)

THEREFORE, from “Dr. Sridhar Rao Center for MANAGEMENT”, ONE innovative ‘WORK OF US’ WE PRESENT, IS ::

1) INTRODUCTION :: MY PROJECTS SPECIALIZATION 18.11.2011

BAPATLA,
18.11.2011.

- PROJECT FEASIBILITY STUDY & ANALYSIS; - - - WHETHER YOUR IDEAS WORK, ETC...
- PROJECT MANAGEMENT - - - TO PUT YOUR IDEAS TO APPLICATION AND REACH A GOAL.
- PROJECT MANAGEMENT APPRAISAL - - - REVIEW OF PROJECT PROGRESS AT TIMES BY SCIENTIFIC MANAGERIAL METHODS.

I SPECIALIZE IN "FEASIBILITY SCIENCE" APPLICABLE TO PROJECTS GENERALLY OF LARGE AND INVOLVED EFFORT AND/OR INVESTMENT. I RECOMMEND FEASIBILITY STUDY AND ANALYSIS FOR YOUR PROJECTS IF NOT ALREADY DONE SO BECAUSE THAT PRIMARY STEP IN THE OVERALL PROCESS ALSO BRINGS FORTH MANY DIVIDENDS FOR AND THROUGHOUT THE ENTIRE PROCESS OF CONCEPT TO COMMISSIONING. MY KNOWLEDGE OF ENGINEERING PROJECTS IS STRONG ENOUGH THAT WITH CERTAIN BACKGROUND IN INFORMATION TECHNOLOGY, I AM ALREADY PROCEEDING AHEAD AMIDST OF VARIOUS SUCCESS AFTER SUCCESS SELF CONCEIVED CONCEPT TO COMMISSIONING PROJECTS. I AM CONTINUOUSLY REFINING MY PROJECTS MANAGEMENT AND MANAGEMENT APPRAISAL KNOWLEDGE AND SKILLS.

THANKING YOU,

SINCERELY YOURS,
(DEVALRAJU RAMBABU)

2) “A new interpretation and content to “(Project) Feasibility Study” has been arrived at in the Complex ever Science & Technology Domain in this Computer and IT era. The interpretation is equally applicable to all our endeavors including in the Information Technology Domain and the Social and Business Domains.”

The Globalized Economic world all around us has given importance to “Projects Concept” to any thing of significance to us and for a viable success in our ventures and endeavors.

By certain Process of intricate research, referencing and by the help of the Providence, we have arrived at a COMPREHENSIVE FEASIBILITY FRAMEWORK for Projects.

“Project Comprehensive Feasibility Framework Study, Analysis and Report Preparation Service for Business, Science & Technology and Information Technology Domains”

3) FROM POINT 2), it led me [rambabu] to : “Feasibility Science” :::

Project Management is a SPECIALTY AREA of work. It PERVADES over all DISCIPLINES OF WORK; especially those of ENGINEERS. We have done a SORT of HIGH LEVEL REVIEW and RESEARCH and HAVE IDENTIFIED GAPS IN THE PRESENT DAY KNOWLEDGE even ACADEMICALLY SPEAKING. IN A COUNTRY LIKE INDIA, THE RESERVE BANK OF INDIA GUIDELINES MAY BE INSISTED UPON BY THE GOVERNMENTS IN POWER IN SUBMITTING A PROJECT PROPOSAL FOR BANK LOANS; But the REALITY OF TODAY’S multinational, multidisciplinary and/or Multi Billion DOLLAR PROJECTS etc... is a CAUSE of NIGHTMARES for CONCERNED CHIEF EXECUTIVES IN CONCEPT to COMMISSIONING. This is where WE STAND FIRM WITH OUR “PROPRIETARY DEVELOPMENT” of ‘feasibility science’..

THE RESPECTIVE PROJECT DOCUMENTS (like PROSPECTUS) :: (THESE ARE NOT PROJECT and/or MANAGEMENT FEASIBILITY REPORTS, BUR ARE INVESTMENT FEASIBILITY REPORTS (in brief)

1. PRELIMINARY DETAILS REPORT (PDR);
 2. REASONABLY DETAILED REPORT (RDR).
- (BOTH DOCUMENTS LEAD YOU TO “PROGRESSIVE INVESTMENT DECISIONS”.)

#####

PHARMA AND MEDICAL BACKGROUND 01.01.2010

of <http://www.Medi-e-HEALTHCARE.Ocatch.com>

Medi-e-HEALTHCARE electronic ESTABLISHMENT
rambabu_d2004@yahoo.co.in

Introducing ourselves to ourselves ”OUR PROJECTS” incl.. Children’s Comp. Edun.. and TUTORING.

But, but THIS IS OUR ORGANIZATIONAL and PERSONAL POSITION PAPER ONLY

1. **HEALTH, repeat HEALTH only**; in a ‘HEALTHY WAY’ AND FOR / IN YOUR IMMEDIATE FUTURE ; It is also that, Mr. RAVURI NARASIMHA VERMA, Railpet opposite Station, IS A ‘HEALTHY’ JOURNALIST OF BAPATLA, AN AWARD WINNER RECENTLY FROM THE COLLECTORATE HANDS OF GUNTUR Dt...
2. **MATHEMATICS** : THIS TYPE OF **HEALTHCARE** SEEM TO HAVE CONFIRMATION UPTO 100% BUT YOU MAY ALSO PROOVE IT.

3. What ever happened INTERNATIONALLY and / or even Sub - locally, CHILDREN STILL ADHERE TO COMPUTER SKETCHES, TODDLERS MAINTAIN COMPUTER PUNCTUALITY and WE, THE SCIENTISTS, ENGINEERS and THE HIGHLY SKILLED TECHNICIANS and TECHNOCRATS HAVE ALWAYS BEEN WITH COMPUTERS, 'RAIN OR SHINE'.

SO FAR TACKLED (completed) :: PHARMACEUTICAL RESEARCH and DEVELOPMENTAL angle, PHARMACEUTICAL VALIDATION and REGULATORY angle, Pharmaceutical PILOT SCALE and COMMERCIAL PROJECT BUILD-UP angle, CLINICAL TRIAL (ORIGINAL RESEARCH IN THE MEDICAL LINE AT A DRUG INTRODUCTION LEVEL), COMPLEX BONE SETTING AIDED BY DRUGS, COMPLEX E.N.T. (Neurological) with drugs, complicated SPECIALIST identification and TRANSACTION IN THE GASTRO line, EVALUATION OF DRUGS QUALITY THROUGH BUSINESS ROUTES and Non Invasive DENTAL SOLUTIONS, Optimal Recovery (in monetary Terms) from Body Weakness, Sprains and Most Appropriate limb Movements in Body Exercise and Tension Disposal, both of BODY and the MIND (that part of the HUMAN SYSTEM that is CONCERNED with the thought and INTELLECTUAL PROCESSES of OUR ROUTINE EXISTENCE :: are some of the MOST IMPORTANT ALREADY, as on 1-1-2010, VERY KEEN and SUCCESSFUL, BUILT WITH ALSO HIGHLY INNOVATIVE and highly "advanced" SPECIFIC KNOWLEDGE, MULTI DOMAINAL .. DYNAMIC MEDICINE :: "A CONCEPTUAL EFFORT FLOUTED TO AN INDIAN MEDICAL JOURNAL" - - - rambabu.741.com and www.Medi-e-HEALTHCARE.ocatch.com - - - rambabu_d2004@yahoo.co.in rambabu_d@hotmail.com

WEBSITE DESIGN, FINE TUNING, MAINTENANCE, COLOURING SCHEMATICS (IN LIEU OF TEMPLATES) AND HIGH QUALITY PROMOTION AND MARKETING MANAGEMENT WITH WEB SPECIFIC PROPRIETARY INPUTS AND IN TANDEM WITH A VERY SOPHISTICATED "WEB - - - COMPUTER PACKAGE OF AMERICAN ORIGIN", THOUGH EVERY THING IS ALMOST A PROPRIETARY EFFORT. OF WWW.MEDI-E-HEALTHCARE.OCATCH.COM IN VERY VERY SHORT TASK TIME OF ABOUT 2 TO 3 MONTHS (PAST) METICULOUS PROJECT AND PROGRAM TIME IN A VERY FORWARD AND REVERSE ENGINEERED METHODOLOGY IN REAL TIME BROADBAND COMMERCIAL NET CAFÉ ENVIRONMENT AS AN OFFICE IN ALSO THE VERY MOST HOT SEASON OF THE ALMOST 2 DECADES. OTHER AND TANDEM PARTICULARS ARE AVAILABLE AT THE WEBSITES.

"SPORTS MEDICINE" - - - A QUALITY PAPER FROM NET; CIRCULATED COPIES IN THE TOWNS AT THE TIME OF INDUSTRIAL EXHIBITION at Vijayawada last year where the theme is very relevant.

OSTIOARTHRETIS (Chronic Body Pains - - - organ related, but not a DISEASE ANY MORE) :: AN IN-DEPTH STUDY BASED PACKAGE RELIEF PROPOSAL.

Final highlight : A FRAME WORK PAPER IN DEALING WITH SUBJECT SEMINARS WITH less diversion into POLICIES and politics OF THE DAY.

A DEEMED TO BE CONSULTANCY

Material on Certain Research & Development Activity suggested for Implementation at Crystal Titanium Products Industry, Saudi Arabia

Specialties and Requirements

Books to be purchased for the Library if not already existing

(for both Process Development and Computer Simulation Works) (Chemical Engineering, Mathematics and Computer Programming subjects)

(An intensive search and scrutiny of many books has revealed these titles)

1. **Unit Operations of Chemical Engineering By P. Chattopadhyay**
2. **A book on C Programming in C By Al Kelley/ Ira Pohl**
3. **A first Book of C Fundamentals of C Programming By Gary J. Bronson and Stephen J. Menconi**
4. **Programming with Fortran 77 By Ramkumar**
5. **Industrial Chemistry including Chemical Engineering By Dr.B.K.Sharma**
6. **Process Heat Transfer By Donald Q. Kern**
7. **Chemical Engineering Volumes 1,2,3 and 6 Coulson and Richardson's**
8. **Process Equipment Design By M.V.Joshi and V.V.Mahajani**
9. **Introduction to Chemical Equipment Design; Mechanical Aspects By B.C. Bhattacharya**
10. **Introduction to Chemical Engineering Thermodynamics By J.M.Smith, H.C.Vanness and M.M.Abbott**
11. **Heat Transfer Principles and Applications By Binay K. Dutta**
12. **Process Systems Analysis and Control By Donald R. Coughanour**
13. **Chemical Engineers Handbook By Perry**
14. **Fundamentals of Momentum, Heat and Mass Transfer By James R.Welty, Charles E. Wicks and Robert E. Wilson**
15. **Heat and Mass Transfer By E.R.G.Eckert and Robert M Drake, Jr.**
16. **Analysis of Heat and Mass Transfer By E.R.G.Eckert and Robert M.Drake, Jr.**
17. **The Spirit of C An introduction to Modern Programming By Henry Mullesh**
18. **Programming in C By Stephen G.Kochan**

19. Numerical Methods for Engineers By Steven C.Chapra and Raymond C.Canale
20. Advanced Engineering Mathematics By Erwin Kreyszig
21. Numerical Algorithms Computations in Science and Engineering By E.V. Krishnamurthy and S.K.Sen
22. Numerical solution of Differential Equations By M.K.Jain
23. Numerical Methods By E. Balaguruswamy
24. Numerical Methods for Engineering Computation By M.K.Jain, S.R.K.Iyengar and R.K.Jain
25. Introductory Methods of Numerical Analysis By S.S.Sastry
26. Transport Phenomena By R.Byron Bird, Warren E.Stewart and Edwin N. Lightfoot
27. Transport Processes and Unit Operations By Christie J.Geankoplis
28. Mass Transfer Operations By Robert E. Treybal
29. Unit Operations of Chemical Engineering By Warren L.McCabe and Smith
30. Properties of Gase and Liquids By Robert C.Reid, John M.Prausnitz and Bruce E.Polng
31. Chemical Reaction Engineering By Octave Lavenspiel
32. Chemical Engineering Kinetics By J.M.Smith
33. Process Systems Analysis and Control By Coughnour and Koppel

A Mini Computer required:

A mini Computer is required to run the Simulation Software with Optimization routines with reasonable speed. Though the current day Personal Computers are fast, it is doubtful whether they can handle the speed requirements of Simulation Software especially Flow-sheeting Systems with Optimization. The preferred Languages to be used for Software Development are C and Fortran 77.

PURCHASE OF A SIMULATION PACKAGE:

Cristal is operating a Commercial Scale TiO₂ pigment Manufacturing Industry. In an Industrial Scale, there are bound to be more Unit Operations and heat Transfer Operations than the 3 processes listed in this write-up for which in-house Software is suggested to be developed. Cristal can hence plan to purchase a Flow-sheeting System which contains more unit operations and heat transfer operations. Computer Simulation Packages are available in the International market of the Steady State and Dynamic Types. It has to be decided which package suits the purpose. Numerical Mathematics will be necessary along with Simulation Packages and it has to be seen whether the manufacturer offers a numerical mathematics package also. Optimization Programs constitute one advance over numerical package. Hence it has to be seen whether the overall package comes along with Optimization routines. In case numerical and Optimization routines are not available with the Simulation Package Vendor, they are to be prepared at home.

A Flow-sheeting Simulation package that comes with it's own language that allows Linkage of Equipment Units in a dynamic fashion allows the entire flow-sheet of a Chemical Process Unit to be Simulated at Computer speeds and hence will be very useful when Optimization of the entire flow sheet is a target.

Modular approach to Flow-sheet Design is to be preferred where each module represents an equipment whose model can be developed as is required and linked to the overall flow-sheet. Thus, models of items described in this write-up can be developed independent of the flow-sheeting system and linked to it as is required.

ACTIVITIES AT CRISTAL THAT CAN BE PLANNED WITH THE APPOINTMENT OF A GROUP LEADER WHO CAN WORK ON SIMULATION PROGRAMS AND SIMULTANEOUSLY WILL HAVE A ROLE IN THE PROCESS DEVELOPMENT GROUP

The Group Leader's Supporting Role to The Process Development Group ::

In the Production of Pigment Grade TiO₂ from Rutile as the starting material, 3 critical steps are involved.

1. Fluidized Bed Chlorination of Rutile to TiCl₄,
2. Distillation of TiCl₄ produced,
3. Oxidation of highly pure form of TiCl₄ to TiO₂.

The high specifications of the products of the three processes makes it uncertain to decide at this stage whether Design of the equipment involved is directly possible or whether a Developmental Stage is necessary in each of the Process/Equipment. This point can be ascertained only after the respective thorough Literature Searches are made (research articles and Patents existing). The exact nature of the Developmental activity if any can only be decided after the literature searches are made. The high specifications also make them necessary/amenable for modeling and Computer Simulation.

I. Fluidized Bed Chlorination of Rutile to TiCl₄:

The bed consists of Rutile mixed with Coke particles through which Cl₂ gas is passed. The reaction temperature is to be maintained within a close range and the reaction is exothermic. A fluidized bed is hence necessary. The

Group Leader has an overall experience of more than 6 years in both the fundamental and applied fluidized bed research/process development. Hence, he is better assigned the work of Design/Process Development of the Fluidized Bed. Further activities in which the Group Leader's Knowledge can be utilized are, Operation and Commissioning of The Fluidized Bed.

II. Distillation of $TiCl_4$ produced:

Ultra high pure distillation with removal of coloring agents will be required. The Group Leader already has experience of research and development of an equipment namely gas-solid fluidized bed. More over, the distillation involved appears to be multi-component with high grade4 distillate requirement. Hence, the problem of Design/Process Development is better assigned to the Group Leader.

III. Oxidation of highly pure form of $TiCl_4$ to TiO_2 :

The surface properties of the TiO_2 powder obtained is controlled by this oxidation. The Burner and the Burning Chamber appear to be critical. Heat, Mass and Momentum Transfer simultaneous along with Particle Nucleation require special study and work. Hence the Design/Process Development is better assigned to the Group Leader.

Simulation Problems in TiO_2 Pigment Manufacture :

- Gas-Solid Fluidized Bed Chlorination of Rutile,
- Distillation Simulation of $TiCl_4$,
- Oxidation of highly pure $TiCl_4$ to TiO_2 ; Burner and Burning Chamber Simulation.

All the three problems can be attempted by the Group Leader responsible for the Simulation Group. It has to be seen whether a static simulation is enough or whether dynamic simulation will be necessary.

A PILOT SCALE UNIT :

After taking stock of the contents of flow-sheet for the Production of Pigment grade TiO_2 From rutile ore and taking stock of the developments that are possible in a period of 2 years, it has been suggested that a Plan should be implemented at Cristal to bring forth a fully operational Pilot Plant within 2 years. The capacity of this Plant can be 10% the capacity of the Commercial Unit Cristal is operating at present. The Capacity of the Commercial Unit is 70,000 M.T.P.A. Experiments can be conducted in such a Pilot Plant to fix the necessary parameters for the design of a fully operational commercial unit.

**** END OF CONSULTANCY THEMES****

DEVALRAJU RAMBABU,
Hyderabad, ANDHRA PRADESH, INDIA.

CERN FINDINGS AND MY REVIEW 26092011::

This paper is dedicated to the efforts of ANNA HAZARE OF INDIA , WHO VERY RECENTLY REVIVED THE VERY CONCEPT OF GANDHIAN METHOD IN CURRENT DAY POLITICAL CLIMATE IN INDIA OF NATIVE ORIGIN, WHICH GANDHI WAS PRAISED BY Prof. ALBERT EINSTEIN IN HIS DAYS AS VERY SIGNIFICANT TO HIS ONE OF OBSERVATIONS.

\$

"When an experiment finds an "apparently unbelievable result" and can find no artefact of the measurement to account for it, it's normal procedure to invite broader scrutiny, and this is exactly what the OPERA collaboration is doing, it's good scientific practice," said **CERN RESEARCH**

DIRECTOR SERGIO BERTOLUCCI. *"If this measurement is confirmed, it might change our view of physics [OR FOR THAT MATTER, THE BROADER or even the STRICTLY METHODICALLY PLANNED, DESIGNED and CARRIED OUT SCIENTIFIC INVESTIGATION [both IN THE EXPERIMENTAL AS WELL AS THEORETICAL DOMAINS and in this complex information era, IN THE SIMULATED DOMAINS, MODELED and/or MODELING DOMAINS] IN ANY SCIENTIFIC DISCIPLINE NARROWED DOWN TO BASICS], but we need to be sure that there are no other, more mundane, explanations. That will require independent measurements { IF however such INDEPENDENT MEASUREMENTS are not feasible in any near future as can be visualized OWING TO COSTS, SOPHISTICATION OF EXPERIMENTAL GADGETRY, UNIQUE NATURE OF THE AUGUST INVESTIGATION (both experimental, theoretical, etc...), the following STEPS IN CONSOLIDATING THE PRESENT FINDINGS CAN TENTATIVELY BE IMPLEMENTED :*

1. ISOLATION of BASIC AXIOMATIC INPUTS TO THE VISUALIZED HYPOTHESIS IF ANY, VISUALIZED BEFORE HAND THE EXPERIMENTAL FOUND TRUTH (FOUND and supposed to be truthful) and/or corollaries TO THE EXPERIMENTAL FOUND TRUTH (FOUND and supposed to be truthful) and their due role CONTRIBUTION TO THE broad based and/or OVERALL NEW FOUND and SUPPOSED TO BE TRUTH;
2. FREEDOM OF SPEECH BASED FINDINGS and/or COMMENTS FROM THE INDUSTRIAL / BUSINESS RESPONSIBLE TECHNICAL PERSONALIA;
3. THE PRESENT EXPERIMENT ITSELF REPEATED in a SCRAMBLED and RE – ASSEMBLED VITAL INPUTS PROCEEDURE TO THE AUGUST INVESTIGATION.”

THIS IS THE KNOWLEDGE I SHARE WITH THE AUGUST INVESTIGATION, FROM THE VITALS OF MY OWN LONG DRAWN STUDIES OF THE PAST, IN THE 1980s :::

1. Gas – solid FLUIDIZED BEDS and A STALEMATE FOR 50 years preceding the 1980s;
2. URANIUM ENRICHMENT CALCULATIONS SIMULATED;
3. MY CURIOSITY WITH Prof. EINSTEIN AT THE VAST UNIVERSITY OF BRITISH COLUMBIA LIBRARY IN THOSE DAYS;
4. MILLIONS OF DOLLARS IN THOSE DAYS AT M.I.T. IN COAL COMBUSTION MODELING but in our hands ONLY THOUSANDS OF PAGES TO READ and SOME MECHANISTIC MODELING EFFORTS IN A TERRIBLY NARROWED DOWN PATH FOR A THESIS;
5. Dr. Sridhar Rao’s CHARITIBLE CRITICISM and MY PRINCIPAL OPPONENT’S SUBMISSION TO “TRUTH”.

But DON’T EVER CRITICIZE PERSONS ON THEIR PERSONAL SIDE OF LIFE, DON’T EVER DEROGATE THE TRUTH SEEKERS, THE HEROS OF THE PAST THAT ARE THE PRIME CONTRIBUTORS TO OUR PRESENT DAY BREAD and BUTTOR ON OUR BREAKFAST TABLE.

THIS IS PERSON TO PERSON OR ORGANIZATION ONLY.

OUR ORGANIZATIONS ARE :::

1. www.rambabu.741.com - - - FOR INTRODUCTION and FRONTAL PAGE DESCRIPTIONS;
2. <http://drsridhrraocentrmgmt.bloombiz.com/> (Dr. Sridhar Rao Center for Management);
3. <http://www.Medi-e-HEALTHCARE.0catch.com>

=====
Sir C. V. RAMAN of INDIA // Science DAY CELEBRATIONS // www.Medi-e-HEALTHCARE.0catch.com
<http://www.Medi-e-HEALTHCARE.0catch.com/> “ SERENITY “ not VANITY.



Radio - Net -Ology ???
 Radio - Net -Ology ???
 Radio - Net -Ology ???

- **YES. Let's CREATE IT BY a Sense of PURPOSE, SHARING LIBERALLY ACROSS CONTINENTS and BY promoting from our MIGHT; to WHAT is it to be BEST and ALSO DURABLE.**
- **SO, JOIN HANDS and STRENGTHEN US even OTHERWISE.**
- **We are qualified in "RADIATION SCIENCES" AS WELL AS “NET and Computer Software Sciences”;**
- **WE ARE ALREADY RUNNING AN ESTABLISHMENT ON THE HEALTHCARE CORE SIDE OF business and WELFARE, GLOBALLY PROMOTED EVEN; and SO, IS IT not, JUST ONE MORE MILE TO REACH A FLOURISHING and LAUDABLE GOAL ? ALL, MAY BE, BECAUSE of YOU IN PARTICULAR ?????**

OUR ORGANIZATIONS ARE ::

1. www.rambabu.741.com - - - FOR INTRODUCTION and FRONTAL PAGE DESCRIPTIONS;
2. <http://drsridhrraocentrmgmt.bloombiz.com/>(Dr. Sridhar Rao Center for Management)
3. <http://www.Medi-e-HEALTHCARE.0catch.com/>



Dear Fellow Citizens

Today is Global Handwashing Day.

Hand washing keeps you healthy every time you do it. When people wash their hands with soap, especially after using the restroom and before touching food (before eating, cooking, or feeding someone), they ensure health for themselves and keep diseases miles away from them. This simple habit can save lives of lakhs of under 5 children dying due to diarrhoea.

Good hygienic practice must become a habit. We should start hand washing practice today and forever.

Guide your children to make hand washing a habit for a healthy and disease free life.

Let's pledge to convert this into a powerful social movement for health.

Dr Harsh Vardhan
Union Minister
Health & Family Welfare



एक कदम स्वच्छता की ओर

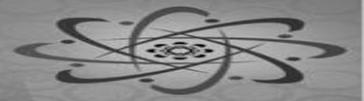
भारत सरकार

विद्यया ऽथवा मृतमश्नुते मृतमश्नुते

Inviting inputs on enhancing the bond between India and the diaspora for Pravasi Bharatiya Divas



PRAVASI BHARATIYA DIVAS
Enhancing the bond between the Diaspora & the people of India



This Open Forum seeks inputs on how to further sharpen the focus of Pravasi Bharatiya Divas for the overall development of India. Share your views on what more can be done to make the interaction between the NRIs and the Government more productive and impactful. How can India receive more investment not only from the diaspora but also from the world at large? [Click here to participate](#)

@@@@@@@@@@@@@@@@

1. MY IMMEDIATE CONCERN WITH RESPECT TO THE ABOVE "MOTION" of yours is "respect the INDIVIDUALS, ESPECIALLY THE ONES of the HIGHLY SKILLED VARIETY" being SUBJECTED TO THE HARSH REALITIES OF THE CONTEMPORARY SOCIETIES abroad AND ALSO ESPECIALLY AT HOME EVEN; owing to a HOST of FACTORS like :
 1. UNEMPLOYMENT;
 2. RACE and DISCRIMINATION FACTORS AT WORK, in the STREET even, AT THE FORUMS of SKILL and TALENT RECOGNITION and WHILE YET TO GET THE BUCK IN THE POCKET.
2. A CRIMINAL LAW PROVISION IN THIS RESPECT IS ONLY A REDEEMING ACT but a preventive instrument IN THE LAW ITSELF IS A HIGHLY FORWARD LOOKING VITAL ASPECT IN CASE YOU HAVE ANY INTENTIONS of inviting THUS SKILL INTERVENTIONS into the society at home IN commotion, CRIMINALITY RIDDEN and TOPSY TURVY IMMEDIATELY AFTER THIS ELECTORAL PHASE CHANGE INTO THE REALITIES of this CONTEMPORARY WORLD AT LARGE vs at HOME.
3. DISCUSS,
4. DISCUSS,
5. DISCUSS,
6. COME WITH A POSITIVE SOLUTION AT THE earliest.

IN THIS RESPECT, MAY I MENTION THAT "THE EQUALITY PROVISION [ARTICLE] IN THE CONSTITUTION OF INDIA ITSELF HAS AN INTERPRETATION THAT INDIVIDUALS "CAN BE UNEQUALS JUSTIFIED and/or JUSTIFIABLE".

D.Rambabu M.A.Sc.(CANADA) proj015BaB@gmail.com

CURRENTLY FUNCTIONING IN COMPLEX BUSINESS and SCIENCE & TECHNOLOGY DOMAINS OF ACTIVITY WITH EMPHASIS ON PROJECTS & RESEARCH.

A ONE TIME MEMBER OF AN INTERNATIONAL RESEARCH GROUP HEADED BY A FORMER DIRECTOR OF UNITED NATIONS RESEARCH, Dr. ERWIN LASZLO, VIENNA, AUSTRIA.

In addition to this SALARY FETCHING EXTERNAL ORGANIZATIONAL WORK , Work as Chief Executive & Advisor, SMILE Services (Services Management Interactive Legal & Engineering) over a period of more than 15 years in functional areas of Research & Development, Projects Formulation and Implementation Workout, General Management and Marketing Management.

1. This is a COMPOSITE WORK SCHEME projected into "RESULTS AZENDA of CERTAIN HIGHER ORDER R&D: **Next-Gen Innovations Through Interdisciplinary Research** inclusive of fine CHEMICALS, Pharmaceuticals, HEALTHCARE, Computer SOFTWARE and PROJECT MANAGEMENT; as well as LAW, COMPLIANCE [MAINLY REGULATORY] and OVERALL MANAGEMENT and ADMINISTRATION.
2. EQUIVALENCE IS THE WATCH WORD FOR THE SELECTION PURPOSES and the matter HAS TO BE 'a priori' TAKEN UP WITH THE CONCERNED GOVERNMENTAL BODIES.MY UNDERSTANDING IS THAT WITH OVERALL EQUIVALENT KNOWLEDGE inclusive of some 'R & D FRONTLINES';
3. MY MANAGEMENT BACKGROUND and SKILLS are EVEN SURPASSING THE REQUIRED COMPETANCY LEVEL FOR A 'DIRECTOR' DESIGNATION IN EACH ONE OF THE DOMAIN ACTIVITY THUS PROJECTED HERE ...

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Economics Policies, Granular Taxation of Fuel Purchases

From: "Adam Sobieski" [REDACTED]

Date: Wed, October 22, 2014 6:07 am

To: pcast@ostp.gov <pcast@ostp.gov>

White House,
Office of Science and Technology Policy,
Office of Policy Development,
National Economic Council,

I would like to present to you topics pertaining to economics policies, to the granular taxation of fuel purchases, policies possible with modern computing technology.

The new policy opportunities include that the United States, states and municipalities could enact tax discounts or tax exemptions for fuel purchases pertaining to categories of shipments or categories of cargos; for example, fuel tax exemptions are possible for the transportation of foods or of construction materials.

Federal, state and municipal laws could facilitate discounting or exempting the taxes upon fuel purchases categorized by the cargos aboard the vehicles at the times of fuel purchases; implementations of such policy ideas are recently possible by means of interoperating information technologies across sectors.

Kind regards,

Adam Sobieski

Electric Car Proposal

From: "Gong15, James" [REDACTED]
Date: Wed, October 29, 2014 9:09 am
To: "pcast@ostp.gov" <pcast@ostp.gov>

Dear Ms. Blumenthal,

I am currently a high school senior at the school Choate Rosemary Hall in Connecticut. Over the summer, I wrote a paper about policies the U.S. could adopt to popularize electric cars in America — a topic I am very passionate about. I believe that doing so is very important for America's future, and thus I put forth some creative ideas that I hope may be helpful to you.

As one of the teenagers getting ready to purchase my first car soon, I believe that many of my peers are open to electric cars, but may need more social incentives to fully convince them to purchase electric vehicles rather than conventional gasoline vehicles.

I've attached my paper as a PDF document to this email. Even if none of my proposed ideas are appealing, I hope that my paper can still serve to convince you that popularizing electric cars is a very important step for America in the long run, and is something the government should actively support. Above all, I hope that writings like mine can help policymakers recognize that teenagers like myself are willing and eager to think of solutions to our country's issues, and contribute to a better future for our nation.

Thanks!

Sincerely,
James Gong

ELECTRIFYING TRANSPORTATION IN AMERICA

By: James Gong

Introduction: Back to the Future

Today, some of the most important responsibilities facing American leaders are reducing pollution and combating climate change. Although enacting more stringent environmental laws and stronger “green” standards are a step in the right direction, drastically reducing the level of carbon emissions in the United States will require a fundamental shift in how America fuels its transportation system. The transportation sector uses the most energy out of any sector in the U.S., surpassing the residential, commercial, and industrial sectors. Furthermore, the transportation sector is the most inefficient energy sector, wasting about 80% of its energy.¹ At the same time, it has also been the fastest-growing source of U.S. greenhouse gas emissions since 1990.² Our transportation sector is home to one-third of the world’s automobiles. Thus, the policies we choose to enforce for our transportation system will undoubtedly have a significant impact on the entire planet. Fortunately, looking to the past can provide us with a solution.

At the turn of the 20th century, electric vehicles (EVs)³ dominated the automobile market.⁴ By switching back to electric vehicles – a mode of transportation nearly three times more energy-efficient than gasoline – we could drastically reduce the world’s carbon emissions. While the conventional



An ad for the Detroit Electric in 1921 highlights its “luxury and coolness”

¹ “Estimated U.S. Energy Use in 2013,” *Lawrence Livermore National Laboratory*, accessed June 27, 2014, https://flowcharts.llnl.gov/content/energy/energy_archive/energy_flow_2013/2013USEnergy.png.

² “Basic Information: Greenhouse Gas Emissions from Transportation,” *United States Environmental Protection Agency*, accessed June 25, 2014, www.epa.gov/oms/climate/basicinfo.htm.

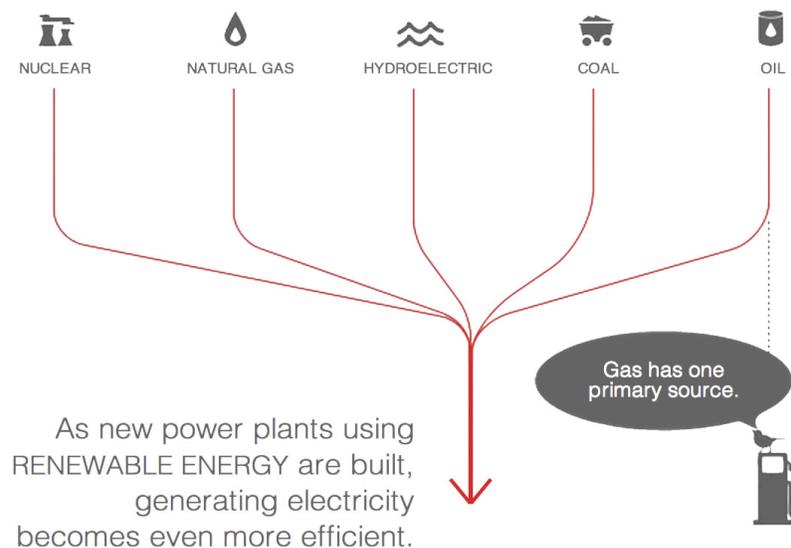
³ The term “EV” includes plug-in hybrids, extended range electric vehicles, and all-electric vehicles

⁴ Mary Bellis, “Wait, There Were Electric Cars Between 1830 and 1930?,” *About.com Inventors*, accessed June 25, 2014, <http://inventors.about.com/od/estartinventions/a/History-Of-Electric-Vehicles.htm>.

vehicle has an internal combustion engine (ICE) that runs on petroleum and produces exorbitant amounts of carbon emissions, a modern plug-in electric vehicle is powered by lithium ion batteries that are charged just like a laptop computer, and releases no greenhouse gases whatsoever.

Indeed, some may argue that electricity generation is also a highly environmentally harmful process. Switching to electric vehicles would simply mean transferring from one pollutant (petroleum) to another (coal), as half the U.S. electricity grid is powered by coal plants. However, even if the electricity used to charge an EV came from a coal-fired plant, the net greenhouse gas emissions from that electric car would still be a third lower than that from a comparable combustion vehicle.⁵ If all of the car-owning households that could potentially use an electric car swapped their gasoline car for an EV, the U.S. would reduce their carbon emissions by 89 million metric tons and gasoline consumption by 15 billion gallons each year. That could save more than \$50 billion a year in gas costs for American consumers.⁶ Moreover, the industry for electric vehicles creates high quality jobs that power economic growth.

More importantly, electrifying the transportation sector opens the door to many new possibilities. While the gasoline that runs 95% of American vehicles can only come from one source - petroleum, electricity can come from a multitude of sources - coal, nuclear, natural gas, hydroelectric, wind, and many others. As more and more modern power plants turn to renewable energy, electric vehicles will become an increasingly clean transportation option. In



An infographic from Tesla Motors, Inc.

⁵ Chip Gribben, "Debunking the Myth of EVs and Smokestacks," *Electro Automotive*, accessed June 27, 2014, <http://www.electroauto.com/info/pollmyth.shtml>.

⁶ Eric Evarts, "Electric Car Survey," *Consumer Reports*, accessed June 27, 2014, <http://www.consumerreports.org/cro/news/2013/12/electric-car-survey/index.htm>.

the state of California, for instance, renewables (13%) already contribute more to the energy grid than coal (12%).⁷ Thus, electric vehicles are an essential step of America's transition to a clean energy economy. Many Americans agree with this. When surveyed, 65% of American drivers agreed that "plug-in vehicles are an essential part of our transportation future for reducing oil use and global-warming pollution."⁸

Electric vehicles are crucial for many other additional reasons. By replacing carbon-emitting cars, EVs would drastically improve air quality in urban areas, ridding smog and eliminating a health risk to American citizens. Furthermore, electric cars run much quieter than gasoline cars, and would greatly decrease noise pollution in urban areas, benefitting the psychological health of city dwellers.

But, a more pressing reason to consider electric vehicles is the impending danger of "peak oil." Petroleum fuels 95% of the United States transportation sector, yet its supply is becoming scarcer and scarcer. As petroleum reserves dwindle, the price of oil will skyrocket, causing unprecedented disasters for the American economy.⁹ By severing America's dependence on petroleum, the widespread use of EVs could help shield the U.S. from these future energy crises. Moreover, America's near-total dependence on petroleum makes it fall prey to the oligopolistic behavior of oil countries, many of which are on bad terms with the U.S. Thus, the widespread use of electric vehicles will also serve to strengthen our country's national security.¹⁰

Overview

Because of the enormous environmental, economic, health, and security benefits of electric cars, we believe that supporting their popularization should be on the top of any government body's priority list. In this policy paper, we briefly examine the reasons why electric cars remain to be unpopular in the American public. Then, we overview some of the policies and measures the public sector has implemented so far, to mitigate some of the hindrances to adoption of electric vehicles. After providing our analysis of why these policies have not been sufficient, we propose several creative approaches that we believe the U.S. could adopt to help popularize electric vehicles – an undertaking with huge benefits in the long run.

⁷ "Environmental Benefits of Driving an Electric Car," *Tesla Motors*, October 4, 2010, <http://www.teslamotors.com/goelectric/environment>.

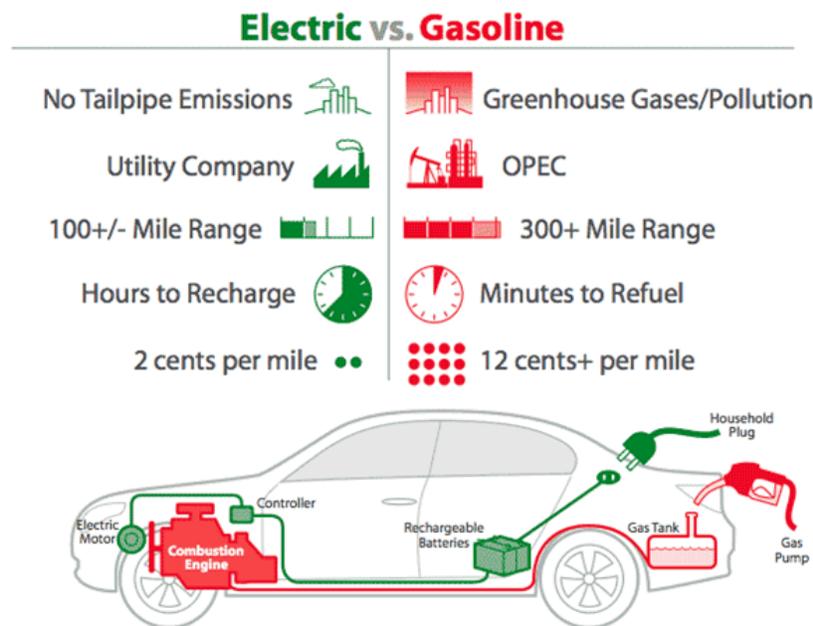
⁸ Eric Evarts, "Electric Car Survey," *Consumer Reports*, accessed June 27, 2014, <http://www.consumerreports.org/cro/news/2013/12/electric-car-survey/index.htm>.

⁹ Richard G. Miller and Steven R. Sorrell, "The Future of Oil Supply," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 372, no. 2006 (January 13, 2014): 20130179, doi:10.1098/rsta.2013.0179.

¹⁰ David B. Sandalow, *Plug-In Electric Vehicles: What Role for Washington?* (Brookings Institution Press, 2009), <http://books.google.com/books?id=i9XEgUchZzgC&printsec=frontcover#v=onepage&q&f=false>, 12

The Drawbacks of Electric Vehicles

There are many impediments to the widespread use of electric cars. Although newer models of electric cars are starting to offer similar features and comforts of conventional gasoline powered cars, they cost more due to the expensive technologies – particularly the lithium battery – discouraging many people from buying them. Electric cars also have significantly less range than gasoline cars, averaging only around 100 miles per charge, causing a sense of “range anxiety” among potential electric car owners. Furthermore, recharging the battery takes far longer than a refill at a gas station would.¹¹ For many, these limitations make EVs an impractical mode of transport. These issues are compounded by the lack of EV-charging infrastructure in the U.S. There is much debate whether new infrastructure will lead to more electric cars, or more electric cars will lead to more infrastructure – a “chicken or the egg” type of problem.



A visual comparison between EVs and gasoline-powered vehicles

However, one of the biggest factors holding back average car buyers is that they simply do not know much about electric cars. In a recent survey among American consumers, only 31% of respondents were familiar with the highest-selling electric car to date, the Nissan Leaf. As a result, the general stereotype of EVs is still negative for many people – as has always been the case for unconventional technologies in the past. Electric cars have commonly been described as “weak”,

¹¹ Brad Berman, “Electric Cars Pros and Cons,” *PluginCars*, April 22, 2014, <http://www.pluginCars.com/electric-cars-pros-and-cons-128637.html>.

“toys”, for “middle-aged geeks”, and condescendingly as “golf carts”.¹² When purchasing a car, many do not even consider EVs, which they assume to be unaffordable, unattractive technologies of the future.

Current U.S. Policies for Electric Vehicles

To address some of these shortcomings, the U.S. has already adopted several policies. The federal government currently provides consumers a \$7500 tax credit (26 U.S. Code 30D) when they purchase electric cars, in hopes of alleviating their high upfront costs.¹³ Furthermore, there are dozens of government mandates that require emissions be reduced on state and local levels by set deadlines. Many states have chosen to promote EVs as a way of meeting these standards. Furthermore, in many places, electric cars owners are granted additional benefits, such as having permission to drive in HOV lanes and receive parking discounts.¹⁴ The Obama administration has also supported a significant amount of research and development into electric car technology, aiming to lower the costs of the electric drive, batteries, and energy storage technologies.¹⁵

So far, these orthodox policies have helped to support a modest 15% annual growth rate in electric vehicle sales.¹⁶ Despite its efforts, the government has so far failed to target the public’s negative perception of electric cars, which remains a formidable barrier to popularization. Of course, adopting even greater amounts of economic incentives would further boost EV sales. But, if the U.S. wishes to popularize EVs at a more rapid rate, it must implement policies that address the public’s fundamental negative perception of EVs. These policies, implemented in collaboration with the private sector, would provide not only more economic incentives but also more social incentives for adopting EVs. First, by marketing electric cars as an attractive, 21st-century vehicle that the American public should desire, a cultural shift towards acceptance of electric cars could be generated.

¹² Zachary Shahan, “Understanding Electric Car Owners & Potential Electric Car Owners (14 Charts & Tables),” *CleanTechnica*, November 26, 2013, <http://cleantechnica.com/2013/11/26/understanding-electric-car-owners-potential-electric-car-owners-14-charts-tables/>.

¹³ Henry Lee and Grant Lovellette, *Will Electric Cars Transform the U.S. Vehicle Market?*, Discussion Paper (Cambridge, MA: Harvard - Belfer Center for Science and International Affairs, July 2011), http://belfercenter.ksg.harvard.edu/publication/21216/will_electric_cars_transform_the_us_vehicle_market.html?hq_e=el&hq_m=1303999&hq_l=5&hq_v=4613decb42, 3

¹⁴ “Policies Affecting Electric Vehicles in the U.S.” (MIT Electric Vehicle Team, April 2008), http://web.mit.edu/evt/summary_policy.pdf.

¹⁵ James Gover, “Do We Need Federal Government Policies to Promote the Adoption of Electric Vehicles?,” *IEEE Transportation Electrification*, accessed June 19, 2014, <http://electricvehicle.ieee.org/2013/10/30/need-federal-government-policies-promote-adoption-electric-vehicles/>.

¹⁶ Sandalow, *Plug-In Electric Vehicles: What Role for Washington?*, 5

Proposal 1: Improving the Public Image

We propose that the government subsidize production costs of film and television studios who positively promote EVs in their media. For these productions, the public sector would also provide special benefits such as filming permits, and production grants. To coordinate this effort, a commission would be created to be in charge of analyzing how favorably a given media production portrays electric cars, and determining the appropriate level of benefits to grant the media producer. Furthermore, the government would offer to finance the amount that electric car companies have to pay to media companies to feature their cars in commercials and product placement.

Promoting cars through the box office is nothing new to the automobile industry. General Motors, for example, successfully paid millions to advertise their new generation Camaro as the cool yellow robot “Bumblebee” in the 2007 movie *Transformers*, before production of the car even started. *Transformers* was a big hit at the box office, and earned three Oscar nominations. Soon after the movie’s premiere, the demand for the Chevrolet Camaro skyrocketed. The 10% increase in yellow Camaro sales alone attests to how successful this form of media marketing can be.¹⁷ General Motors’ marketing strategy showcased their product in a cool and stylish aura, thereby increasing consumer demand. This same strategy can and should be applied to electric vehicles.

Media marketing does not have to be limited to theaters. Automotive companies heavily invest in television commercials to market their product. Many of these commercials feature scenes in which cars are ridden at full acceleration across picturesque backdrops. Though many car buyers drive at speeds less than three miles per hour while stuck in traffic, it is the exhilarating experience captured on the screen that sells these cars to the public. For instance, Chrysler, a forerunner in the automotive industry, spent over \$64 million between 2009 and 2013 in 30-second commercial advertisements for the Super Bowl.¹⁸ While the U.S. does not have to invest large amounts of money for government-sponsored television marketing, it should support emerging electric carmakers who are using these marketing strategies, by subsidizing the rates these carmakers have to pay to the TV station to have their electric car commercial aired. If the public sees EVs more and more on their media platforms, they may start to perceive them as a trendy technology worth looking into.

Another effective strategy that can help redefine public perception of electric cars is showcasing them in car racing events. John Heitmann, president of the Society of Automotive

¹⁷ Marc Graser, “How Chevy’s Camaro Changed With the ‘Transformers’ Franchise,” *Variety*, June 26, 2014, <http://variety.com/2014/film/news/how-chevy-camaro-changed-with-transformers-franchise-1201242157/>.

¹⁸ Emily Coyle, “5 Biggest Super Bowl Advertisers Going for It,” January 25, 2014, <http://www.usatoday.com/story/money/business/2014/01/25/5-biggest-advertisers-going-for-it-in-super-bowl/4835695/>.

Historians, suggests that public car races are “among the most important technological demonstrations... by seeing these cars racing, that alone will change a lot of perceptions of people.”¹⁹ Millions tune in each year to watch sport cars speed around concrete tracks at over 100 miles per hour. Though the exhilarating experience of car racing events may not compel the average car customer to buy one of the sports cars, they still leave a covetous and appealing effect on many viewers. Imagine then, if viewers knew that they could buy the same type of innovative car being showcased on television? Car racing events featuring electric cars would expose traditional car enthusiasts to electric cars, and demonstrate how electric cars can be as sporty as gasoline cars. FIA, which hosts Formula One, has already begun shifting towards EVs. They have launched the world’s first fully-electric car racing championship, Formula E, in September 2014. Cumulative live television views are estimated to reach up to 205 million,²⁰ meaning that there will be enormous publicity generated for electric cars.

The government should use this event as a model for supporting electric cars races of the future. Should the end result of the Formula E event produce positive publicity for electric cars, the government could reinforce this marketing success in smaller, local car racing events around the country, to further popularize the image of EVs with the public. Local car racing associations would be subsidized by the government if they choose to host fully-electric car races similar to the Formula E event in cities around the U.S. Furthermore, racing teams who enter an electric car into popular car competitions would be endorsed by the government either through monetary incentives or through public recognition. On the whole, these policies would create an increased cultural acceptance of electric cars as they are integrated into a media that highlights its “swag factor.”



The inaugural season of Formula E began in September 2014 in Beijing

¹⁹ Leo Mirani, “How to Make Electric Cars Sexy: Race Them on the Streets of the World’s Biggest Cities,” June 3, 2014, <http://qz.com/214350/how-to-make-electric-cars-sexy-race-them-on-the-streets-of-the-worlds-biggest-cities/>.

²⁰ Christian Sylt, “Formula E Forecasts Television Audience Of 205 Million,” *Forbes*, May 27, 2014, <http://www.forbes.com/sites/csylt/2014/05/27/formula-e-forecasts-television-audience-of-205-million/>.

Proposal 2: Getting People to Try Out EVs

Another way to change the public's perceptions of electric cars is to simply give people more opportunities to test-drive EVs. We propose that the public sector work with the private sector to initiate electric car-sharing programs in urban locations around the country. The federal government would provide grants and special benefits to local governments who agree to sponsor these programs. The local public utilities commission would invest the money to build the charging station infrastructure for the program, and the city government would invite private companies to supply the electric vehicles, while subsidizing their manufacturing cost.

Car sharing is a car rental system in which people rent out cars for short periods of time, and return them to stations around the city. In recent years, car-sharing programs have risen greatly in popularity, especially among the younger generation, stemming largely from the growing trend towards a shareable economy. Very often, consumers are influenced by the cars that they are exposed to in car-sharing programs. By getting individuals exposed to electric car models through car-sharing programs, we could encourage them to consider buying EVs in the future.

There is a large amount of data that indicates that people who get to experience electric cars firsthand will be left with a positive impression. Since EVs are driven by an electric motor, they are completely silent, and deliver smooth linear acceleration. Furthermore, because of their low center of gravity and balanced weight distribution, they have instant torque, and are very easy to maneuver.²¹ These hallmarks have made electric vehicles very enjoyable to use. As one car-owner who swapped his primary vehicle for an EV said, "everyone wants to drive electric vehicles, they just don't know it yet."²² It is no surprise that a recent survey showed that 91% of people who owned electric cars said that they were "very satisfied." Not a single person in the survey was unsatisfied with their electric car.²³

Despite this, "non-PEV drivers are generally unaware of the great performance in terms of speed, power, and smoothness that a PEV has versus conventional vehicles."²⁴ Thus, we believe that this socially-oriented policy is particularly effective, in that it can get people to experience electric cars first-hand, which may alter their perception of the vehicles and cause them to reconsider electric cars as a transportation option. Our policy would work particularly

²¹ "What Is an 'Electric Car?'" *NYC.gov*, accessed June 25, 2014,

<http://www.nyc.gov/html/ev/html/you/electric-car.shtml>.

²² Sandalow, *Plug-In Electric Vehicles: What Role for Washington?*, 3

²³ Zachary Shahan, "Norwegian Electric Car User Findings (10 Charts)," *CleanTechnica*, December 3, 2013, <http://cleantechnica.com/2013/12/03/norwegian-electric-car-user-findings/>.

²⁴ *Bay Area Plug-in Electric Vehicle Readiness Plan* (ICF International, September 2013), <http://www.bayareapevready.org/assets/Background-Analysis-PEV-Readiness-Plan-Draft-Final-v2.pdf>, 333

well in urban areas, since trips around the city would be short-distance, so the limited range of electric cars would not raise an issue. Also, having droves of electric cars driving through the busy streets would let many people see for themselves electric cars being used. This would raise public awareness of EVs, and cast the image that they are becoming a more widespread form of transportation. Furthermore, urban residents tend to be more environmentally-conscious, so they make a suitable customer base for these electric car-sharing programs.

The city of Paris has had great success implementing a similar electric-car sharing program, Autolib', which is composed of EVs provided by the private company Bolloré. According to Véronique Haché-Aguilar, a city official, Autolib' has greatly contributed to the uptake of EVs in the Paris area by offering high visibility and "normalizing" the use of the technology. "Like biking and public transportation before them, Autolib' vehicles are now part of the Parisian landscape."²⁵ As we can see from this example, these electric car sharing programs can go a long way toward assimilating this growing mode of transportation with the public.



After having success with Autolib', its electric car-sharing program in Paris, the French company Bolloré has worked with the city of Indianapolis to initiate BlueIndy

Conclusion: From Model T to Model S

In this paper, I demonstrated the importance of electric vehicles to America's environmental, economic, energy, and security future. I then explained why electric cars remain unpopular in America, and identified the measures that the government has adopted to change

²⁵ Ben Holland, "Autolib' Electric Carsharing Program," *CleanTechnica*, April 2, 2014, <http://cleantechnica.com/2014/04/02/autolib-electric-carsharing-program/>.

this. However, U.S. policy must also address the fundamental issue of the public's negative perception of EVs before they can be successfully popularized. We propose several ideas for policies to achieve this, ranging from supporting media marketing that improve public opinion of electric cars, to car-sharing programs that can expose the public to electric cars.

When US households were surveyed in 2013, it was discovered that taking into account the limitations of electric vehicles, more than a quarter of American households could still make EVs their sole means of transportation. However, less than 1% currently do.²⁶ Already, the EV market has great potential to grow. As EV technology keeps improving, the price of EVs will continue falling, and electric cars will become a greater disrupting force in the transportation industry. Just like how Ford's Model T initiated the switch to a gas-dominated automobile industry in the 1920s, fashionable, high-performance electric cars like the Tesla Model S and BMW i8 will lead the way back to a predominantly electric transportation sector. We believe that if government officials adopt innovative policies like those we suggested, while working in tandem with the private sector, they will pave the way for the popularization of electric vehicles in America, and secure a bright future for our country.

²⁶ "Infographic: Millions of Americans Could Use an Electric Vehicle," *Union of Concerned Scientists*, accessed June 27, 2014, http://www.ucsusa.org/clean_vehicles/smart-transportation-solutions/advanced-vehicle-technologies/electric-cars/bev-phev-range-electric-car.html.

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