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TABLE OF CONTENTS

	Page
American Foreign Policy In Eritrea and the Greater Horn of Africa Brett Cunningham, Department of Political Science	4
Head of The Class Brad Moorer, Department of English	7
Model of Two Competitors Competing For A Prey Jud Partin, Department of Mathematics	8
Tay-Sachs Disease David Leumont, Department of Chemistry	11
The Role of C/EBP Fusion In Cell Differentiation David Leumont, Department of Biology	13
Can Federally Funded Magnet Schools Effectively Desegregated Schools? Dean Sproles, Department of Education	15
The Enron Debacle Priyadarshini Mukherjee, College of Graduate and Professional Studies	20

AMERICAN FOREIGN POLICY IN ERITREA AND THE GREATER HORN OF AFRICA

Written by: Brett Cunningham

When one considers the subject of U.S. foreign policy toward Africa, several things may come to mind: the "pyrrhic" victory of the American military's humanitarian assistance in Somalia, or U.S. involvement with the "freedom fighters" in Afghanistan and Angola, or even possibly president Reagan's sledge-hammer tactical air strike against Libya in the 1980s. There exists one particular country in Africa, however, that probably does not enter one's mind when one thinks of U.S. foreign policy toward the continent. This seemingly insignificant and currently unobtrusive strip of land along Africa's Red Sea coast represents, however, a textbook example of American post Cold War foreign policy toward the continent in general and sub-Saharan Africa in particular. That country is called Eritrea. In December of 1950, the United Nations resolved to place Eritrea, until then a British territory, under the sovereignty of the Ethiopian crown (Harding, 263). Two years later, with this new "federation" about to emerge, John Foster Dulles, President Eisenhower's secretary of state, outlined the U.S. position on this issue to the United Nations Security Council: "From the point of view of justice, the opinions of the Eritrean people must receive consideration. Nevertheless, the strategic interest of the U.S. in the Red Sea basin and considerations of security and world peace make it necessary that the country has to be linked with our ally, Ethiopia" (264). Today, in 1996, with the independence of the Eritrean Nation only three years old, these "strategic interests" lie no longer in Ethiopia but in the country of Eritrea itself. These "interests," which compromise the U.S. foreign policy toward Eritrea, are of a three-fold nature: political, economic, and military. For the most part, they are not the same interests that existed in the cold war international environment of the Eisenhower administration, but rather one of preventing crises of humanitarian nature, as occurred in Somalia. However, this noble aspiration remains a difficult task to accomplish, given the constraints of the formulation of American foreign policy and the recent history of the U.S. involvement in Africa.

In May 1993, shortly after the American casualties returned home from Somalia, Eritrean president Isaias Afewerki visited the White House to "urge the Clinton administration and congress not to let the bitter experience of Somalia lead the United States to withdraw from the continent's affairs" (New York Times, 4 May 1993). Afewerki announced, if somewhat arrogantly, that it is "an obligation for the U.S. to have a major role in Africa" (New York Times, 4 May 1993). Whether or not Afewerki's self-proclaimed expertise on U.S. foreign policy has any foundation, it remains important to examine just what factors comprise American political interest in Eritrean affairs. Indeed, the Institute for National Strategic Studies, in its *Strategies Assessment 1995*, concluded that "whether approached from a practical or an idealistic perspective, the U.S. has an important humanitarian interest in Africa; namely, reducing the violence and chaos that are currently engulfing a number of African nations" (101). With respect to Eritrea, the Clinton administration gives "high marks" to President Afewerki for "supporting diplomatic efforts to end civil wars in Somalia and the Sudan" (New York Times, 4 May 1993). However, given Eritrea's recent conclusion to its own bloody thirty-year war for independence, President Clinton would rather now wait until Eritrea becomes entrenched in its own "civil war," a circumstance which, in Africa, is traditionally exacerbated by poor economical and political conditions. So what is being done to prevent such an occurrence?

On 26 July, 1994, J. Brian Atwood, administrator of the U.S. Agency for International Development (USAID), stated the following before the Senate Foreign Relations Subcommittee on Africa: "In the Greater Horn of Africa, USAID now estimates that 23 million people are at risk of starvation or displacement due to a combination of factors that include drought, ethnic strife and conflict, and chronic food shortages." This situation explains the urgency and concern of President Afewerki's visit to Washington, spurred by his "alarm" at the desire of many Republican lawmakers to "slash economic aid" to Africa and "eliminate" the \$800 million Development Fund for Africa (New York Times, 4 May 1993). In his testimony, Atwood stated that, in a report to President Clinton, two major objectives for the U.S. foreign policy toward the Horn of Africa were outlined: 1) that "immediate action is needed to prevent the current emergency in the Horn from escalating into a full-blown crisis," and 2) that a "long-term regional strategy is needed to break the cycle of famine." Congress and the Clinton administration initially responded to this situation by allocating FY 1994 resources in the amount of \$366 million, plus additional resources of \$214 million, along with early "programming" of "up to 100,000 metric tons of FY 1995 food resources for emergency programs in the Greater Horn region" (Atwood, 26 July 1994). Atwood explained to the Subcommittee on Africa that this "groundwork for a new approach to long-term food security and sustainable development" remains essential to "achieve our common goal of moving from perpetual relief to... a foreign policy based on prevention." He assured the subcommittee that such allocations are "ensuring that we avoid destabilization in the region, that fewer lives be lost, and that the ultimate costs of these operations will be significantly lower." For the moment, both the Senate and President Afewerki were probably satisfied.

On 1 May 1996, the statement of John F. Hicks, Assistant Administrator of USAID, before the Senate Subcommittee on Africa, would paint a different picture of the program outlined by Atwood just two years earlier. Hicks explained that Africa had become a "casualty" in the budget battles of the U.S. government, and that "development assistance resources were significantly reduced and attention to the continent's unique needs declined when the congress discounted the Development Fund for Africa appropriation this past year." Hicks stated further that such action "threatens our ability to make critical investments in agriculture and private sector development which are fundamental to our sustainable development strategy for Africa." This discontinuation of funds by congress was no doubt related only to the budget crisis, but also to the Somali debacle, as reminisced by President Afewerki. The good news was that USAID vowed not to give up on the Horn region, proclaiming that "we expect to maintain about a dozen full sustainable development programs in Africa, to accelerate graduation of several others and to operate limited assistance programs in about eight other African countries" (Hicks, 1 May 1996). Hicks spoke of the intent of USAID to "[coordinate] with all other U.S. government agencies, private voluntary organizations, and businesses through our country team approach." By far the most enthusiastic and promising portion of Hicks' message was a USAID program known as the Greater Horn of Africa Initiative (GHIA), which had been in place since shortly after the independence of Eritrea.

Hicks stated that the "most important development under the GHIA is the way the Africans themselves, particularly the presidents of Eritrea, Ethiopia, and Uganda, have taken the leadership of the Initiative... placing conflict prevention front and center." For the American taxpayer, the GHIA had four strategic objectives: 1) new regional capacity for crisis prevention and civil society (\$1,050,000), 2) implementation of strategies and procedures to ensure the transition from crisis to broad-based sustainable growth (\$4,000,000), 3) realization of greater regional collaboration in promoting sustainable economic growth (\$5,450,000), and 4) to strengthen support for regional and national food security strategies (\$4,500,000)" (Hicks, 1 May 1996). Indeed, as Assistant Secretary of State George E. Moose announced before the Subcommittee on Africa, this type of economic and political "assistance to Eritrea supports U.S. interests by promoting economic recovery and growth, and democratic governance to underpin national stability in a historically volatile region." It is through government organizations, such as USAID, and programs like the GHIA that U.S. political foreign policy toward Eritrea has been developed and coordinated. This policy may be summarized to be the promotion of a stable government and society which will, in the near future, become self-perpetuating without fear of collapse or civil war. However, programs such as GHIA also provide a basis for U.S. economic foreign policy toward Eritrea.

A 29 September 1995 New York Times article announced that "using advanced technology developed in the Gulf of Mexico the Andarko Petroleum Corporation said... that it would begin searching for oil in the Red Sea." The article explained that "Andarko said... that a production-sharing contract had been signed with the Ministry of Energy in Eritrea." Earlier that year Assistant Secretary of State Moose proclaimed that "...trade and investment are indeed becoming a fundamental aspect of U.S.-Africa relations" (Moose, 16 February 1995). He stated that "the transformation of sub-Saharan Africa has significant implications for U.S. interests." In fact, in his speech denouncing the discontinuation of congressional aid for African development, Assistant USAID Administrator Hicks, admitted that the GHIA is "...creating models for transforming adversity into advantage, energizing and synergizing private and public investment, and building mutually beneficial partnerships" (Hicks, 1 May 1996). Indeed, in 1993 U.S. exported almost \$4.8 billion in goods and services to sub-Saharan Africa (Moose, 16 February 1995). The Institute for National Strategic Studies calls these opportunities, such as the Andarko-Eritrean agreement, a "critical... U.S. national interest in the African continent" which must be viewed as an "intangible but real value of adding additional friendly states to the western sphere of stable, democratic, and free market nations" (101). The Institute further outlines U.S. economic interests in Africa to be: the protection of existing U.S. investment and the encouragement of further investment, developing mutually beneficial trading links, and safeguarding the stability of supplies of African oil and minerals" (102). Assistant Secretary of State Moose says that "by some estimates" "every extra \$1 billion in exports adds 19,000 new jobs in the United States. Accordingly, "doubling our exports to Africa could create an additional 90,000 jobs at home" (Moose, 16 February 1995). It is figures such as these that provide the initiative for U.S. economic policy toward Eritrea. Programs such as the GHIA set up framework for economic ties to be developed with countries such as Eritrea. This U.S. government sees Eritrea as an extremely promising market for U.S. enterprise as exemplified by the Andarko contract. This goal must be supported by political foreign policy toward Eritrea in order to maintain an environment conducive to American investment and free market ideals. The only component of U.S. foreign policy with regard to Eritrea that remains to be analyzed is military policy. It is a policy that grew out of the cold war concerns of decades past, but now has become dictated by somewhat modified aims.

In the years preceding the collapse of the Soviet Union, the United States had numerous "geostrategic interests" in Africa: namely, "protection of U.S. sea lines of communication, fending off a real or imagined Soviet plan to capture Africa's strategic minerals, prying Cuban surrogates off the continent, preventing the establishment of Soviet bases and listening posts, and others" (INSS, 101). From a post-cold war perspective, the CIA World Factbook of 1995 now defines Eritrea's military significance to be its "strategic geopolitical position along the world's busiest shipping lanes and [its proximity] to Arabian oil fields." This position of the United States' most prominent intelligence organization reflects the new military ideology of protection of U.S. economic interests, as opposed to countering a real external threat. Assistant Secretary of State Moose explained that, "Eritrea's two deep water ports and shipping lanes in the Red Sea are of strategic importance in the Middle East and Horn of Africa regional contexts, and are principle lifelines for humanitarian assistance to the Horn region." It is absolutely vital to recognize this interwoven nature of U.S. military foreign policy toward Eritrea with its political and economic counterparts. Just as programs such as the GHIA acted in support of both political and economic foreign policy, so too do the military strategists with regard to Eritrea support the economic and humanitarian aims of the same policy as a whole. One final consideration of U.S. foreign policy toward Eritrea, that may be categorized as either military or political, is that of the impending Islamic revolution in the greater Horn region. The Institute for National Strategic Studies reports that "the Islamic revival may spread into...East Africa, in particular Kenya, Somalia, Tanzania, Ethiopia, and Eritrea" (99). The Institute predicts that, if the U.S. becomes too deeply involved in the affairs of Eritrea, there exists "a prospect for serious terrorist incidents, perhaps extending into the U.S. itself" (100). That would become a sad state of affairs for the Horn of Africa and Eritrea in particular, as the American public opinion toward further foreign aid to that country could possibly become akin to sending aid to Iran, Iraq, and other militant Islamic nations.

In conclusion, the relative political, economic, and military foreign policies of the U.S. toward Eritrea can be seen not only to be indicative of African policy as a whole, but also U.S. perspective toward a depolarized international community. The focus, especially in Eritrea and the Greater horn region, no longer remains one of Soviet deterrence, but rather insuring that countries such as Eritrea do not go the way of the Somalias and the Rowandas of this world. The Institute for National Strategic Studies recognizes that "demands for U.S. involvement and assistance...are growing even as the resources and political will necessary to undertake such involvement are shrinking" (97). In fact, the public perception that U.S. interests in Africa are "minimal" truly "militates against such involvement" (97). Given the high costs of military involvement in Somalia and the millions in aid dispatched by USAID each year, it is probable that the U.S. government would just as soon let other countries closer to the African continent take the lead in humanitarian endeavors. But the fact remains that the U.S. must remain committed to countries like Eritrea, if it wants its interests and resources protected with any degree of certainty. The only solution that would not involve further commitment of U.S. troops to that region would be for "Washington to

promote measures to build the capabilities of African nations and organizations...to better deal with Africa's emergencies as well as long-term needs" (INSS, 97). It is questionable, however, that leaders such as Eritrea's Afewerki would ever accept an eventual total withdrawal of U.S. aid, given his statement that the U.S. has an "obligation" to Africa. Perhaps the Eritrean government does not desire a true "independence", such as it fought for thirty years to achieve. It is more probable, however, that the U.S. would never desire a true divorce from a region which one day may become extremely strategically vital to American foreign policy.

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HEAD OF THE CLASS

Written By: Brad Moorer

The Victorian Period of English history is characterized by perpetual social discontent as well as economic and political change. The eighteenth century redistribution of wealth, which was brought on by industrialization and urbanization, was a template for class animosity that carried over to the nineteenth century. The Industrial Revolution sparked the rise of the factory system in order that the British citizenry could compete with the mercantilistic economies of the world. English literature was also subjected to a transformation; whereas the Romantics favored the poem as a form of literary expression, the Victorians favored the novel. Charles Dickens manifested the ideals of Victorianism more than any other, and his novel Great Expectations is a study of the social atmosphere of the period. This novel furthers the theory that a person's blood should not be the basis for determining his worth to society or his social standing.

Several of the characters in Great Expectations are able to cross certain "boundaries" to their respective classes. The first, and most obvious, is Pip. He is able to become a so-called gentleman due to the generosity of his benevolent benefactor. The second is Mr. Jaggers. Jaggers is not genteel because he works for a living, yet he is still able to amass a small fortune as a prosperous middle class lawyer. He also possesses many traits that could be considered genteel despite the fact that he is not of noble blood. Lastly, Joe Godfrey is never able to escape his position in life, yet he is perhaps the most virtuous of the characters in the novel. Joe is aware of his station in life, and he accepts it. Because of this, he is able to maintain his virtue and be more honorable and act with more integrity than any gentleman in London.

Pip first appears as a child in a windblown cemetery, apparently visiting the gravesite of his deceased parents. This is where his first encounter with the convict takes place. In his youth, Pip seems to have had a sense of personal integrity. He displays this integrity when he gives food and drink to the convict even though he knows he could get in trouble for it. He sees the man not as a convict, but as a hungry, desolate person who needs his help. He places the worries of someone else above his own, displaying his sense of integrity. Later in his childhood, he is befriended by an old woman named Mrs. Havisham who beckons him to play at her house. Pip does not realize this, but he is nothing more than a pawn in a sick game. Even in this awkward situation, Pip keeps his manners and respect for those he considers to be his superiors.

Pip's youthful behavior can be contrasted to his behavior as a gentleman in order to see the fallacies of the English class structure. When he becomes a "gentleman," the issue of vanity comes into question. Are Pip and his roommate, Herbert Pocket, vain? The obvious answer is yes. Rather than being humble, as he was in the presence of Mrs. Havisham and Estella, Pip becomes full of arrogance and conceit as a gentleman. Herbert has been arrogant since his first encounter with Pip way back in Mrs. Havisham's garden. It is not until Joe Godfrey visits Pip in London that Pip realizes his shortcomings as a gentleman. For the first time, Pip begins to wonder if he has sold his soul and turned his back on his family. He realizes that when he was a commoner, like Joe, he was much more virtuous than he is now. In fact, Pip has traded his virtue for his vanity.

Jaggers is also an interesting character. He is obviously an honorable man, because so many members of the upper class trust him with their fortunes and well-being. He performs his job in a professional, timely manner that is characteristic of a person with virtue. Even though he is a working man, Jaggers is able to display these gentlemanly qualities. Also, he is able to serve as a sort of bridge between the upper and middle classes. This is the nature of his relationship with Mrs. Havisham. Jaggers was able to set up Estella, who had less than noble origins, with Mrs. Havisham when Estella's father was no longer able to take care of her. In the end, we find out that the convict whom Pip had helped as a child is Estella's father. Jaggers plays a large role in making sure that this was kept a secret. Estella was raised to be a lady despite her father's lowly station in life. This, coupled with Pip's humble origins, just goes to prove that birth alone cannot make a person noble. Neither Pip nor Estella are very noble of character in their new roles as members of the upper class until they are mature enough to realize their own vanity.

Joe Godfrey is a man who is at ease with himself and content with his station in life. Joe realizes that he will never be a gentleman like Pip, yet he is nevertheless overjoyed with Pip's prosperity. When they first learn of Pip's benefactor, Joe is elated and not one bit jealous. He even offers to remove Pip from his apprenticeship in order to not stand in the way of Pip's good fortune. Never once does Joe ask Pip for a penny; instead he prefers to make his own living and live within his means. Even though Pip was not related to Joe, Joe raised him under his roof and took him as his own son, never asking for a thing in return. This shows Joe's good-hearted nature and his high sense of morality.

To be noble of character and noble of birth are totally separate. In nineteenth century England, people were easily confused with this. The class structure proved to be entirely superficial, just as were the people who put so much stock in it. Every character in the novel was able to cross the supposed class "boundaries," mainly because people have the same inherent human characteristics of goodness, no matter how hard the class system has been ingrained into their minds. Perhaps Pip could have learned a lesson in humility from Joe or Biddy, and learned a little less from Mrs. Havisham, Estella, or Herbert Pocket.

This social consciousness of the period was lagging behind the ideals of the French Revolution, which were slow to spread to England. It was not long after this novel, however, that the old social order began to wither in favor of the new, merit based system of determining people's self worth. Perhaps Dickens embraced the social reforms of the Continent and wrote this novel as a satire to demonstrate the fallacy of the English social order. Whatever the case, he was successful in bringing to light the inadequacies of the privileged, leech-like upper class which was sucking the life from the middle and lower classes in every way. He also proved that noble birth was not necessarily a pre-requisite for virtue, honor, or personal integrity.

A MODEL OF TWO PREDATORS COMPETING FOR A PREY

Written By: Jud Partin

Modeling is a combination of intuition and reason to explain many natural phenomena. It is an approach to problems which does not require the equation(s) in question to be solved explicitly. These equations are sometimes a system of differential equations, a partial differential equation, or a system of partial differential equations. The model contains equilibrium or critical points of three natures: unstable, stable, or asymptotically stable. Around these critical points are curves which describe the position and orientation of the variables called orbits.

In computing the model of a system of differential equations, the equilibrium points must be found. They are called equilibrium points because the system is at equilibrium at these points. There is no net change in the system because the derivative of each variable is equal to zero. These points are stable if a point close by does not go off far as time elapses. It is unstable if a point close by does go far away in time and is referred to as a repeller or source. A special type of stability called asymptotically stable is when all points close to the equilibrium point converge to the equilibrium point and is called an attractor or a sink. Two special cases of critical points are saddles and centers. A center is somewhat self-explanatory; if a motion starts near a center, then it stays nearby on a periodic orbit encircling the center for eternity. A saddle fits its nomenclature because here a particle is repelled in one or more directions but is attracted in other directions.

The orbits of a model are the trajectories of solutions to the dynamical system. These orbits are unique. Once the initial values are specified they do not cross each other. The solution of the differential equations, both linear and nonlinear, are smooth curves. Orbits are directed with increasing time. In order to determine shape and direction of the orbits and the stability of the equilibrium points the local linearized theory is implemented.

In order to linearize a nonlinear system, it needs to be expanded into a Taylor series at each critical point. After the partial derivatives have been taken for each equation and each equilibrium point has been substituted in, the higher order terms can be dropped. These higher order terms are negligible and can be ignored in the small neighborhood of the critical point. After this expansion has taken place at each critical point the eigenvalues of the Jacobian are found.

The system can be set up in matrix form. Once this is done, the characteristic equation, $\det(\lambda I - A) = 0$, is computed for the system where λ is the eigenvalue(s) for the matrix A . The eigenvalues can be of two general natures: real and complex. For both types, if the real parts are negative, then the critical point in question is an attractor. If one or more of the real parts are positive, then it is a saddle or more generally, a repeller is the nature of the critical point. The nature of the equilibrium point, stable for an attractor and unstable for a repeller, locally describes the path of the orbits and their orientation.

Now that a general case for a system of differential equations has been looked at a more specific case will be analyzed. This problem involves two predators and one prey. Both of the predators feed and live off of the prey which is in the habitat. At the same time, the two predators are in competition with and intimidate each other for their food source, the prey. The system is then allowed to run over time and the status of the dynamic system is to be modeled.

First, the system of equations governing the ecosystem needs to be set up. The biomass of the prey will be the variable x , the biomass of predator 1 will be the variable y and the biomass of predator 2 will be the variable z .

The system for the problem is as follows:

$$x' = r_1x - s_1xy - l_1xz$$

$$y' = -r_2y + s_2xy - m_1yz$$

$$z' = -r_3z + l_2xz - m_2yz$$

(Where the prime denotes the derivatives with respect to time t .)

For the equation concerning the growth of the prey, x , it grows at the rate of r_1 times the amount of population of x already present. The $-s_1xy$ term shows how predator 1, y , eats the prey as food and the population of x decreases. The ability of the prey to get away from y is s_1 . A small s_1 means that the prey is evasive and is able to elude predator y most of the time where a large value for s_1 means it is caught and eaten more. The multiplication of x and y simply represents an encounter between the two. The $-l_1xz$ term is the same scenario except with predator 2, z . The same arguments can be given substituting l_1 for s_1 .

The second equation is interpreted somewhat differently. In it the first term $-r_2y$ is how predator y dies without the only food source, the prey. A small r_2 means that predator y is dying slowly in the absence of x and is trying to find a way to survive where a large value for r_2 is the opposite. The $+s_2xy$ as seen in the first equation except here instead of being eaten, a negative value, y is doing the eating, hence the positive value. The parameter s_2 is the hunting ability of y or how well it catches its food, x . A small s_2 would mean a poor hunter where a large value would be a good hunter. The competition between the two predators is represented in the $-m_1yz$ term. The influence of predator z on predator y to scare away from the food is m_1 . A large m_1 means that predator z almost always scares away predator y from the food and a small value is the converse. Without food, the species dies which accounts for the negative sign.

For the third equation, the same argument is given as for the second equation except that y is substituted for z , z for y , and the parameters are switched.

For this system, there are many parameters in the equations. Three for each equation and three equations yields nine parameters. This makes it difficult to analyze the model. Therefore, suppositions are made to reduce the amount of parameters. Supposition 1: y and z die off at the same rate if no food is present which implies $r_2 = r_3 = c$ (new variable). Supposition 2: the time may be scaled, that is $t = ct$.

With these two assumptions, the number of parameters are reduced or consolidated. Three new equations are now obtained:

$$\begin{aligned}x' &= ax [1 - Ay - Bz] \\y' &= y [-1 + ax - bz] \\z' &= z [-1 + gx - dy]\end{aligned}$$

The following changes have been made to the parameters: $a = r/c$, $A = s_1/c$, $B = l_1/c$, $a = s_2/c$, $b = m_1/c$, $g = l_2/c$, $d = m_2/c$, and c has been eliminated. Also, the derivatives of x , y , and z are all with respect to the new variable t .

It is now time to find the critical points of these three equations. There are five points at which this happens:

$(0, 0, 0)$, $(0, -1/d, -1/b)$, $(1/g, 0, 1/B)$, $(1/a, 1/A, 0)$, and the interior point

$$(Ab + Bd + bd, bg - Ba + Bg, Aa - Ag + da)$$

$(Agb + daB, Agb + daB, Agb + daB)$ hereafter referred to as (x_0, y_0, z_0) . The point $(0, -1/d, -1/b)$ can be disregarded as a critical point since it is not in the first octant. A population or biomass cannot have a negative value. The interior point gives rise to two inequalities which naturally govern the system if the interior point is to be found in the first octant. They are $g(b + B) > aB$ and $a(A + d) > gA$. For the first inequality, if b were small, then $g > a$. The interpretation of this would be that if z did not influence y in the hunt then z will always be a better hunter than y . If the b term is significant then z will be eating more of the food due to scaring y off and g will not have to be as large. Therefore, if z is able to intimidate well, it does not have to be as good of a hunter as y . Predator y tries to adapt to the competition by becoming a better hunter or increasing a in order to survive.

This same argument applies for the second inequality of $a(A + d) > gA$. As d gets smaller, then $a > g$. Or, if y intimidates z less, y is naturally a better hunter. Also, if y intimidates well, d is sufficiently large, then it does not have to be as good of a hunter as z . These two inequalities show the delicate relationships between the two predators and their interaction with the prey.

The origin is given the name of a saddle. This occurs because the eigenvalues for it are $l = a, -1, -1$. The two negative values are attractive forces in the y and z direction while the positive a is a repeller in the x direction. This attraction in two directions and repulsion in a third causes a saddle point to arise. This saddle can be visualized as a horse saddle; a surface coming towards the origin then going back out into space.

The other two equilibrium points can be linearized to give eigenvalues which in turn show how the orbits look in the neighborhood around each. When the point $(1/g, 0, 1/B)$ is linearized, it gives the values of $l = a/g - b/B - 1, + I(a)$ for the eigenvalues. The complex conjugate of $+ I(a)$ indicates that there are some types of periodic orbits in the space near the point. The value $l = a/g - b/B - 1$ represents the two cases of attraction. If $l > 0$ the critical point is a repeller and if $l < 0$ it is an attraction. These two cases give rise to the inequalities $1 + b/B > a/g$ and $1 + b/B < a/g$.

Survival of y is the focus of this argument. If an attractor is the case then y is extinct and $1 + b/B > a/g$. Here, b and B are how well z intimidates y and how badly x is eaten by z , respectively. Meanwhile, a and g are how good of a hunter y is and how good of a hunter z is, respectively. The inequality is saying that as z does a better job of intimidating y and eating all of the food, then y will die out and become extinct. For this scenario, a will be smaller than g so the right hand side of the inequality is getting smaller, while the left side is always greater than one. For this y will always die out and the orbit is attracted to the xz -plane. In this case, the interior point is not in the first octant.

The converse happens when the eigenvalue is positive and $1 + b/B < a/g$. This ratio of a and g in this case is always greater than one. This means that y is a better hunter than z . Also, the intimidation of z on y and how much z eats x is not as great. Now, y will survive and the point in question is a repeller as stated.

For the point $(1/a, 1/A, 0)$, the system is linearized and $l = g/a - d/A - 1, + I(a)$ are the eigenvalues. The same argument for the previous equilibrium point can be given here as well. The complex pair reveals a periodic orbit in space about the point while the real eigenvalue depicts the attraction. If the real value is less than zero, it is an attractor: $1 + d/A > g/a$. If it is greater than zero, it is a repeller: $1 + d/A < g/a$. Again, the same arguments hold. The basics of which are if an attractor is present, y is a better hunter and intimidates z more, so becomes z is extinct. If it is a repeller than z is a better hunter and is not intimidated as much by y so z survives and the orbit is kicked back out into the octant.

With the combination of these two points in space, there are four possible cases: 1) both points are attractors, 2) One point is an attractor and the other is a repeller, 3) The attraction and repulsion of the two points switch, 4) Both points are repellers. If both points are attractors, case 1, then the initial conditions are very important and quite sensitive since the attraction could go either way. If one is a repeller and one is an attractor, cases 2 and 3, then obviously one of the predators survives (the plane which is repelling, ie. if it is in the xz plane then z is stable and y is extinct) and the other becomes extinct. For both of these cases, when the elliptical orbit caused by the complex conjugate eigenvalues hits the plane, the simplified logistic model, or Lotka-Volterra Model, arises. This is a periodic motion about the critical point. Since one of the predators died out, then there is no competition, and only a predator-prey model exists. When cases 1, 2, and 3 occur, the interior point falls out of the first octant. Either one or both of the inequalities stated earlier of $g(b + B) > aB$ and $a(A + d) > gA$ are not satisfied. If $g(b + B) < aB$ or $a(A + d) < gA$, then the y or z value is negative which removes the point from the first octant.

The fourth point is an interesting situation. If both points are repellers, then the point $(1/g, 0, 1/B)$ produces the inequality $1 + b/B < a/g$ which rearranges to $g + bg/B < a$. This implies that $a > g$. Likewise, the point $(1/a, 1/A, 0)$ yields the inequality $1 + d/A > g/a$ which rearranges to $a + da/A > g$. This implies that $g > a$. There is an obvious contradiction here. If the interior point (x_0, y_0, z_0) lies in the first octant, then the discrepancy $a > g$ and $g > a$ is present. Since this is not possible, then coexistence is not feasible. One of the species must adapt or evolve in order to survive. The predator which is not getting the food will have to do something different in order to satisfy its natural instinct to survive. It may change its eating habits by eating a different food source. Also, it could improve its game by becoming a better hunter or not letting the other, more intimidating predator, frighten it off. If it does not mutate, it will become extinct.

This model has some powerful applications. It implicitly alludes that evolution of species, as stated by Darwin, does take place. In order for a weaker species to survive, it must evolve. It does this by either changing its diet, behavior, or physical characteristics to help in its quest for rations. If it does not do any of these alternatives, then it will die off and the fitter species will dominate. In any of these cases, a coexistent example of two predators competing for a common prey is non-existent in nature.

TAY-SACHS DISEASE

Written By: David Leumont

GM2-gangliosidosis (Tay-Sachs disease) is perhaps the most familiar sphingolipidosis affecting the nervous system. Other diseases include; Gaucher's disease, Niemann-Pick disease, and Sandhoff's disease. The Tay-Sachs disease affects French-Canadian and eastern European Jewish families, especially those from provinces near the Baltic Sea. Three percent of all Jews from Ashkenazic descent are carriers for the disorder. Besides people of Jewish decent, Tay-Sachs disease occurs in lower frequencies in every ethnic and racial group. Approximately 1 in every 3600 infant of Ashkenazic Jewish ancestry feels the effects of the Tay-Sachs disease, and about 1 in 30 is a carrier of the mutant gene. The disease seems to have its highest frequency in the Ashkenazic Jewish community because of its religious based, intercommunal marriages. The sociological effect responsible is called the Founder effect. The Founder effect occurs where a new population establishes itself with a small number of inhabitants and results in a more restricted gene pool than that of the general population. Although, extremely rare, congenital Tay-Sachs disease does exist and occurs from a missense or non-sense mutation. The congenital form of the disease occurs soon after conception and causes the non-inherited form of the disease.

Tay-Sachs disease is an autosomal, homozygous, recessive disorder that presents itself on the 5th and 15th chromosome. The disorder results in an inborn metabolic error that causes the absence hexosaminidase A. The cause of this disorder is either a missense or nonsense mutation on the *hexosaminidase A* gene or (*hex A*). The distinction between the two mutations depends on the population studied. In Ashkenazis, the mutation appears as a missense since no protein synthesis occurs, while the gene is still intact. French-Canadians lack the gene altogether, accounting for the absence of the protein. The mutation in the French-Canadian strain is a 5-8 kilobase deletion. This subsequent absence of (*hex A*) causes an accumulation of sphingolipids, specifically, GM2 ganglioside, in cells of the brain and central nervous system. Normally a very minor ganglioside component, the disease causes the GM2 ganglioside to become 90% of all ganglioside make up. These gangliosides accumulate in cytoplasmic lysosomes that grow in size until the cell dies. The GM2 gangliosides mainly accumulate in the brain and nervous system. Lipid-laden cells are identifiable in the liver, spleen, and lungs, also.

Three forms of Tay-Sachs disease exist; Type I (Infantile), Type II (Sandhoff's), and Type III (Juvenile). Infantile Tay-Sachs is the most common form of the disease found and presents itself six months after birth. GM 2 ganglioside is absent in the blood. This results in swift onset of the disease and death by age five. Type II, Sandhoff's disease, is somewhat different from traditional Tay-Sachs. Sandhoff's disease occurs when there is a mutation in the *hex A* as well as the *hex B* genes. Deficiency of the *hex B* gene causes the buildup of the globoside protein that, along with GM2 gangliosides, produces the same general defect as Type I Tay-Sachs. Type III is the juvenile form of Tay-Sachs. The disease, in this case, presents itself at age 5. Instead of a complete lack of Hexosaminidase A, there is a small amount, causing the delayed manifestation of the disease. Because of the slight presence of protein produced by the hexosaminidase A gene, gangliosides do not accumulate as quickly.

Tay-Sachs infants appear normal at birth. After six months of normal development, the infant begins to show signs of regression in motor skills and an exaggerated startle response emerges. Simple occurrences, such as, coughing or doors closing, begin to startle the infant severely. The child begins to lose its ability to grasp objects and move normally. Responses to the infant's environment diminish. Irritability increases and becomes harder and harder to suppress. Clinical diagnosis shows extremely low levels of hexosaminidase A and a cherry red spot with a white halo surrounding it appears on the interior of the retina. This continues through the first year of life, which constitutes the first stage of the disease. Around the beginning of the second year, the second stage initiates. Motor skills continue to diminish and the child loses control of his head completely. Paralysis ensues late in this stage. Blindness results from the accumulation of ganglioside buildup in the retina. Congestion is another side effect of ganglion buildup in the lungs. Seizures begin and grow in frequency. Moodiness persists and nutritional and dietary problems ensue because of combinations of the other symptoms. Pressure sores are common because of paralysis. Stage three begins with complete paralysis and retardation. The infant is now completely blind and deaf, and seizures are higher in frequency. The head enlarges because of the overgrown brain tissue, and fits of bronchial pneumonia begin to surface. Stage four is now eminent. Child becomes more peaceful and cells become oxygen deficient as a result of several respiratory diseases such as; cyanosis, apnea, and anuria. Death ensues around the fortieth month as a result of bronchial pneumonia.

Tay-Sachs is presently incurable, while prevention is possible. Carrier screening is a way of preconceptional prevention. In 1970 a serum carrier detection method was introduced. Presently, a simple blood test detects lower than normal Hex A in parents. Tay-Sachs was the first disease that called for masses of a population to be screened for carriers. If both parents happen to be carriers, they have a 25% chance of having a diseased child, a 50% chance of producing a carrier, and a 25% chance of having normal offspring. Most Rabbis in Jewish communities require carrier testing before a marriage is approved. Fetuses that are subject to the disease can be monitored through amniocentesis and affected fetuses can be therapeutically aborted. Prenatal diagnosis is feasible and most methods are accurate in detecting all types of Tay-Sachs.

This disease is a particularly insidious and devastating disease. Parents and family are drained emotionally and financially after the death of their infant. The child's existence is doomed until a cure is formulated and genetic research is the only path towards this cure.

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THE ROLE OF C/EBP FUSION PROTEINS IN CELL DIFFERENTIATION

Written by: David Leamont

Mechanisms behind cellular growth and differentiation are poorly understood topics in research. One participant in these processes has been found to be the CCAAT-enhancer binding protein (C/EBP). Evidence indicates that this complex is essential in terminal differentiation and the cessation of mitotic growth of hepatocytes and adipocytes. C/EBP is a family of bzip transcription factors consisting of a- through b- species.(1,3) C/EBP a- and b- are the specific proteins being investigated with the C/EBP a- moiety being associated with differentiation in hepatocytes and adipocytes while C/EBP b- is used in differentiation in myelomonocytic cells.(3)

C/EBP is a dimer containing a basic region and a leucine zipper. Each species can form homo- or heterodimers. The hydrophobic leucine zipper at the C-terminus is the site of dimerization which forms prior to binding at a specific C/EBP binding site on the DNA strand. The basic region is the domain that actually complexes with the strand and is comprised of two anti-parallel b-sheets. The basic region is found near the N-terminus and is the site of transactivation. The C/EBP binding sites can be found anywhere on the gene and are usually associated with a promoter. A promoter is a regulatory region close to the 5' end of a gene that acts as the binding site for RNA polymerase, which initiates transcription. Δ _fos is a promoter that is often used in our preparations. This promoter is usually found with the fos gene, yet it meets our needs by acting as a weak promoter. The genes associated with this sequence are usually related to energy metabolism with serum albumin specific for the liver being a common affiliate. C/EBP binding sites are found near BAM sites which makes it convenient for cutting the enzyme to make constructs. These sites are also devoid of introns which also makes manipulation easier.

It has been discovered that C/EBP is expressed much more heavily in terminally differentiated liver cells (hepatocytes) than in their immature counterparts. Adipoblasts have shown no signs of indigenous C/EBP expression during growth. Once the C/EBP gene is activated in adipoblasts, the post mitotic state is induced and specialization to an adipocyte occurs. Terminally differentiated cells, specifically intestinal and skin cells, express C/EBP. C/EBP induced terminal differentiation has shown two effects- cell specialization and cessation of mitotic growth.(3)

Regulation of C/EBP with hormonal binding sites has been found to be successful. Once ligated, C/EBP expression becomes dependent upon the presence of the hormone without directly affecting the structure or function of C/EBP.(2) Both glucocorticoid receptors (GR) and estrogen receptors (ER) have been shown to regulate C/EBP expression. Activation of C/EBP-GR occurs only in the presence of dexamethasone while C/EBP-ER is activated by b-estradiol. Even though similar levels of activation are seen with both the glucocorticoid and estrogen receptors, there is a distinct problem because dexamethasone is growth inhibitory which causes elevation to the post-mitotic state without the presence of C/EBP.(1) This is not a problem with b-estradiol, making the estrogen receptor the preferred hormonal binding domain. The effects of C/EBP-ER on cell lines is reversible. Once b-estradiol is removed, the cells are again able to grow.

We are studying the role of C/EBP-ER a- and b- (C-a-ER and C-b-ER) in cell differentiation and cessation of mitotic growth of several different cell lines. The cell lines that we have most recently experimented with are La- cells (mouse fibroblasts), 3T3 cells (mouse fibroblasts), MM5MT cells (mouse mammary cells), HEPA 01 cells (mouse hepatoma cells) CHO cells (Chinese hamster ovary cells), and Hela cells (human fibroblast.) Each cell line takes a certain pathway of experimentation and protocol.

A typical sequence of protocols that is presently being initiated would begin with the making of a construct plasmid. C/EBP is inserted into the plasmid. If it is to be ligated with ER, the plasmid is cut with BAM and the ER is then inserted. The BAM site is naturally present at the end of the C/EBP sequence. The DNA is sequenced on a sequencing gel to determine if the plasmid was correctly made. If so, this plasmid construct is then reproduced with the help of bacterial cells. In order to isolate these constructs that were made, a maxi prep is conducted. After all of the needed chemicals and enzymes are added, the tube is centrifuged for two days. The tube will then contain bands of DNA in the center of the tube, with the unneeded material at the bottom. The nicked DNA cannot be used and is present in the higher of the two DNA bands. The supercoiled DNA, which is present in the other DNA band, is then collected by piercing the tube with a syringe and carefully drawing it out. The plasmid DNA is then transfected into the desired cell line with two pathways that can be followed to transfect the cells- PLO and C/P (calcium/phosphate). Determination of which protocol is more efficient in certain cell lines is presently being researched. These cells are fed and grown and, when substantial colonies are formed, placed on a stock plate. A mini prep is later performed to determine which of the stock cells were successfully transfected with being found via a gel shift. The cells that were successfully transfected with the C/EBP or C/EBP-ER sequences are spread onto plates, fed, and allowed to grow in the incubator. These plates can be split once they grown a sufficient amount. Nuclear extracts are conducted on the stock cell plates to isolate the nuclear proteins, specifically C/EBP fusion proteins. Several experiments can now be performed on the collected protein. Acrylamide gel shifts (electromobility shift assays or EMSA) are a good initial factor in determining if the C/EBP proteins are present. We use CAT (Chloramphenicol Acetyl Transferase) assays to see if C/EBP is functional and compare it to levels of indigenous C/EBP. These are conducted on proteins with and without ER regulation to determine the effects of hormonal control on the cell line. LUC (Luciferase) assays are performed as an internal control. Luciferase is used because it is a strong promoter and results show if the transfection was successful as light is given off from the tube. Protein assays are conducted to determine the protein concentration. Cell counts can also be initiated from the initial stock plates. These give a general overview of the effects of C/EBP species on cell growth.

Once the results of these experiments on C/EBP are elucidated, many future pathways can be followed. One generalized direction could be to "obtain other C/EBP fusion proteins and a LIP clone to determine their effects on cell growth and differentiation."(3) Another could be to "perform immunoprecipitation and Western blotting with a monoclonal antibody for Retinoblastoma (Rb)."(3) Finally, we could proceed to "utilize probes to Rb, cyclins, cdk's and CKI's in order to define the early molecular events."(3) With further under-

standing of these topics, they may lead to mechanisms that arrest cell growth in tumor cells. If not, this mechanism remains an interesting and important form of research that will yield important insights into molecular cell biology.

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CAN FEDERALLY FUNDED MAGNET SCHOOLS EFFECTIVELY DESEGREGATE SCHOOLS?

Written By: Dean Sproles

Abstract

The purpose of this project is to determine the effectiveness of federally funded magnet schools as an effective desegregation device. Representing the only government based effort to achieve desegregation, the Magnet Schools Assistance Program should show tremendous success in its efforts. The popularity of magnet schools is growing; however, many questions still remain unanswered about the progress towards integrated public schools. Many school districts face extreme demographic hurdles, requiring the busing of students to achieve integration. Money is continually granted to schools on promised efforts, but the actual expenditures by schools for desegregation remains questionable. This author explores the efforts and achievements of magnet schools in their primary purpose of desegregation and proposes future research efforts to ensure the focus of these schools is maintained.

The U.S. Supreme Court ruling in 1954 in *Brown v. Board of Education* outlawed segregation and acknowledged that racially separate schools are essentially unequal. After the *Brown* decision was made lower courts across the country issued desegregation orders to school districts. For some districts this meant re-drawing school boundary lines; while for others it meant bussing students from other districts. Four decades have passed since this landmark decision forbidding segregated schools, but many schools across the country still maintain essentially segregated schools (Desegregation, 1996). After two decades of progress toward integration, the separation of minorities in America's schools is on the rise and is approaching the levels of 1970, before bussing students was utilized. In the nation, a third of black public school students attend schools where the enrollment is 90% to 100% minority (Kunen, 1996).

As the 1954 suit claimed, it appears that racial balance does affect student achievement. Taylor and Piche (1990) found that segregated schools are more likely than predominately white schools to be financially and educationally inferior, as determined by laboratory equipment, pupil/teacher ratios, advanced curricula, and computers. Orland (1990) discovered that school based achievement differences reflect not only the race of students but the fundamental inequities between districts serving poor minorities and districts serving more affluent white students. Portes and Gran (1991) performed a study on the performance of high school students in Dade County which showed that predominately white schools have the highest average test scores, and those in predominately black schools scored the lowest. It also showed that students, regardless of their ethnic background performed better in schools that were predominately white. These inequities in performance levels suggest the necessity of desegregation policies to eliminate the differences in achievement (Ascher, 1996).

Magnet schools represent the nation's only federally funded effort to achieve school desegregation (Magnet Schools Assistance Program, 1994). As defined in a recent study by Steel and Levine (1994), magnet schools provide a distinctive curriculum or instructional approach, draw students from beyond an assigned attendance zone, and make desegregation an explicit purpose (Types and Experiences of Focus Schools, 1996). Magnets offer a wide array of programs emphasizing particular subjects or themes, such as math (37 percent); special instructional approaches (27 percent); vocational training (14 percent); gifted and talented programs (12 percent); or a focus on the arts (11 percent) (Schmidt, June 15, 1994).

McNeil (1987) noted that most magnet schools were established either under court desegregation orders or under the threat of such orders. These have provided an incentive for centralized decision-making and control: a certain number of magnets are specified and are expected to reach agreed upon levels of success in ethnic distribution. As a result, centralized control has been asserted under the name of school reform and excellence. Metz (1981) found that while some magnet schools have been sufficiently self-governing in developing their schools, others reflect very minimal organizational change. Blank, Dentler, Baltzell, and Chabotar, and Magi, 1983 claim organizational change is not the emphasis of magnet schools. Despite the awareness that converting to a magnet school seems to improve quality, magnet schools have often been started to satisfy external demands instead of to transform or restructure schools (Types and Experiences of Focus Schools, 1996).

The proposed research would analyze the sociological aspect of schools in terms of segregation by ethnicity. The question this research is intended to answer is - can the existing federally funded magnet schools effectively eliminate segregation in today's schools? In doing so, efforts must be made to define exactly what is a magnet school, examine the current achievements of magnet programs leading to the extensive growth in popularity, review the current demographic problems requiring the busing of students, review racial requirements for schools involved in magnet programs, and determine the accountability of grants afforded by the Magnet Schools Assistance Program. The research gathered will conclude that magnet schools can be effective an effective instrument as a desegregating device.

Sample Magnet

The efforts of magnet schools can effectively be understood by examining a sample school district presently implementing the magnet system. The Charlotte-Mecklenburg schools have a vision to become "the premier urban, integrated school system in the nation." Eighteen different magnet programs are offered in thirty-two Charlotte-Mecklenburg Schools. Many of the schools offer a magnet program and a comprehensive educational program for neighborhood students, which gives families greater options as they make educational choices for their children. The main intent of the program is to provide a setting where students with different backgrounds can share similar interests as they grow and learn together. Students are bussed from around the county to the magnet schools where they learn the core curriculum as well as attend classes in their magnet theme area. The magnet school themes established consist of the following: academically gifted at three elementary schools, the academy of finance at one high school, accelerated learning academy and

extended day program at one elementary school, communication arts/academic studies schools at two elementary, one middle and one high school, German immersion at one elementary school, international baccalaureate at two elementary, four middle, and three high schools, international/global studies at one elementary school, learning immersion center at three elementary schools, mathematics/science and technology at two elementary, one middle and one high school, Montessori primary program at one elementary school, Paideia Academy at one elementary school, traditional/classical schools at three elementary and two middle schools, the visual and performing arts at one elementary and one high school, and a year round school at one elementary and one middle school. Charlotte-Mecklenburg Schools currently receive aid from the Magnet Schools Assistance Program which they use to revitalize the schools with magnet programs. With local funds made available from the receipt of federal grants, they can strengthen neighborhood schools as well.

To be eligible to apply for the magnet schools, the student must be a resident of Mecklenburg County. Priority for admission is given on the following guidelines (1) To students already in the program (2) To students applying for admission to a school in which a sibling attends (3) To students living within a safe walk from the school (4) To students who live in the former attendance area of the school prior to its becoming a magnet (5) To students who live within one of the ZIP codes included in the schools transportation zone (Charlotte-Mecklenburg Schools 1996-1997 Magnet Program).

Popularity Growth and Achievements

From 1983 to 1992 the number of students involved in magnet schools tripled to 1.2 million (Hendrie, 1996). The Magnet Schools Assistance Program supports more than four hundred schools each year (Magnet Schools Assistance Program, 1994). Currently, approximately 1.4 million students attend magnet schools, with more than 60% of them being non-white (Title V--Promoting Equity, 1996).

Several longitudinal and controlled studies relate the positive impact of magnet schools on students. A new national study suggests that students learn more in magnet schools than in either public, private, or Roman Catholic schools. Data was collected on 4,000 urban high school students using the 1988 and 1990 data from the National Educational Longitudinal Study which looks at the gains students make in achievement test scores from the 8th through the 10th grades. Based on prior academic achievement, magnet schools made greater gains in reading, social studies, and science than did the students from the other schools (Viadero, 1996).

Musumeci and Szczypkowski (1991) performed a longitudinal study of almost 1,000 students in four separate school districts, which contrasted the achievement and orientation of longtime magnet school students with students who had only spent a brief period of time in magnet schools. With regards to promotion rates, enrollment in college preparatory classes, academic success, behavior and attendance, and participation in school, the long time magnet students out performed the other students.

A similar study was conducted by Crain, Heebner, & Si in 1992. Their study compared ninth graders involved in New York City magnet schools with ninth graders going to comprehensive schools. The magnet school students were less likely to drop out of school, were more productive academically, improved more in reading skills, and earned more credits towards graduation than did the students at comprehensive schools.

Larson and Allen (1988) performed a study carefully pairing students who entered magnet schools with those who did not. They found that the magnet students accomplished more within the school, and that the longer the students remained in magnet schools, the greater the difference in performance. Essentially every study performed shows that magnet school students have higher achievement levels, better attendance and drop-out rates, and an overall better performance (Types and Experiences of Focus Schools, 1996).

Demographic Obstacles

In recent years, much has changed in the nation's demographics and housing patterns, as well as its commitment to school desegregation. Since 1980, eight million immigrants have flooded into the United States bringing two million new students. Although educators in many cities still work hard to ensure that their schools are as desegregated as possible, others have completely abandoned the goal of desegregation. These particular cities argue that their urban areas have become too racially segregated to make integration possible. Casserly (1992) reported that only nine out of 47 urban districts in the Great City Schools network have a majority white enrollment. In January 1991, in the case of *Oklahoma City v. Doyle*, the Supreme Court ruled that formerly segregated school districts may be released from court ordered busing once they have taken all practicable steps to eliminate segregation. According to the Court, school districts are not held responsible for the housing patterns as long as the patterns were a result of choice (Ascher, 1996).

Almost a quarter of the grants made under the Magnet Schools Assistance Program have gone to districts that are at least three quarters minority and about four percent have gone to districts with minority enrollment over 90%. Although these districts may have been worthy recipients, their desegregation efforts will mean a major reshuffling of students (Schmidt February 2, 1994). A major result from these grants is the establishment of extensive busing programs designed to develop more racially balanced schools. Many leaders in black communities are leading efforts to end busing because black students are most often the ones who are forced to travel the long distances

Race Requirement for Attendance

Vacant slots are continuously occurring in magnet schools because of established racial requirements. In Prince George's County at Valley View Elementary School, there was a shortage of 50 students for the Talented and Gifted Program as pointed out by the principal Inez Sadler. She could not choose from the 67 students on the waiting list for the program because they were all black and the 50 remaining positions were for whites. In the past two decades, this school system has gone from being predominately white to being predominately black. This has all come from a federal court mandate whose main thrust is to prevent schools from becoming too heavily black. This system is criticized by parents because the school system is denying thousands of black children entrance to highly regarded

magnet programs in the name of desegregation. Currently, at least 4,100 black students are on waiting lists for magnet programs which have openings for white student only (Frazier, 1995).

A study by Steele and Levine (1994) noted that more than half of the magnet programs had a waiting list, with the longest lists found in the gifted and talented and career and vocational training magnets. It also determined that while magnets usually are located in large, urban districts with a substantial number of students from low income, limited English proficient minority students, these groups are under represented in magnet programs because of success in luring white students from surrounding areas (Types and Experiences of Focus Schools, 1996).

A study by Wells (1991), of a court-ordered voluntary transfer plan in St. Louis vividly demonstrates the limits of choice for black students in desegregated schooling. The research determined that, given the choice to attend either segregated urban or predominately white schools, the African American parents did not necessarily choose the predominately white schools. This poses another question as to the actual desire of blacks to attend integrated schools (Ascher, 1996).

In an increasing number of school districts, race based assignments have been blamed for hindering school reforms enabling students to choose where they attend school (Schmidt September 27, 1995). Boston Latin High School and Lowell High School in San Francisco are presently fighting race based assignments in court. The argument is whether the established quotas that limit the number of black students to attract more white students actually exclude the students it was intended to help (Desegregation, 1996).

In August, 1995, the Montgomery County Maryland school system denied two Asian-American students admission to a French-immersion program. The officials from the district claimed that enrolling these students would harm the efforts to maintain Asian-American enrollment in neighborhood schools. After being brought to national attention as being compared to the South African apartheid, the school board reversed its decision.

In Kansas City, Missouri, an established goal of 35% white students keeps blacks barred from the most popular schools on account of their race. A federal district court ordered the state to spend 1.7 billion dollars to create a state of the art facility to lure whites into the schools. In June, 1995 the Supreme Court ruled that the district court had no authority to order the state to spend money to attract suburban whites. As a result of this decision, many cities across the country are beginning to remove their mandatory desegregation programs (Kunen 1996).

Grant Accountability Questioned

The Magnet Schools Assistance Program was established by the U.S. Department of Education and represents the only federally funded program to aid in desegregation efforts (Hendrie 1996). Its purpose is to provide financial assistance to eligible local education agencies to support (1) "the elimination, reduction, or prevention of minority group isolation in elementary and secondary schools with substantial proportions of minority students; and (2) courses of instruction within magnet schools that will substantially strengthen the knowledge of academic subjects and marketable vocational skills of students attending these schools" (Magnet Schools Assistance Program, 1994). More than one billion dollars has been distributed since the mid-1980's through this program.

Magnet Schools Assistance Program funding primarily targets large urban school districts with high proportions of minority and low-income students. These urban school districts enroll 25% of America's students but they receive 83% of the federal funding for desegregation. The funding is also only granted to those schools that are whole-school magnets as opposed to the idea of a school within a school. No more than four million dollars per year can be granted to any local education agency.

The program defines exactly how the schools may use the federal funds, for 1) planning and promoting any activities related to the expansion, continuation, or enhancement of services involved with the magnet school; 2) purchasing books and any other materials needed by the magnet and pay for school maintenance; and for 3) paying the salaries of licensed or certified elementary and secondary school teachers in magnet schools (Magnet Schools Assistance Program, 1994).

The American Institutes for Research performed a study in which they found that 453 of the 1,068 schools that received grants during two-year cycles starting in 1989 and 1991 did not meet the objectives proposed by the Magnet Schools Assistance Program. In some cases, the school hoped to increase minority enrollment at predominately white schools but failed to show how that would alleviate racial isolation at mainly minority schools. In other cases, the documentation of enrollment was unavailable or the goals presented were too scanty. The researchers also discovered that the annual performance reports required of grant recipients did not measure the school's success at improving integration (Hendrie, 1996).

When Congress reestablished the Magnet Schools Assistance Program in 1994, it enacted the Elementary and Secondary Education Act which called on school districts receiving grants to demonstrate exactly how their magnet system would increase racial interaction. Congress, however, did not require them to prove that magnet grants would result in integration. A critic of the program, Christine H. Rossell professor at Boston University said the program "Should be what it was intended to be originally -- a desegregation - funding measure." The federal M.S.A.P. grants have been going to school districts where the magnet programs were too poorly designed to draw students, or where there were too few white students to have an impact on the racial balance (Schmidt November 30, 1994). While some districts achieved notable levels of integration through magnet schools, Rossell and Armor found that desegregation plans with magnet programs appeared to accomplish little more desegregation than comparable plans without magnets. The Education Department officials maintained the view that the research was flawed (Schmidt February 2, 1994).

The critics of the program claim that information pertaining to its success are being withheld by Congress to protect its existence. Many schools are dependent on the federal funding for operation. The main point of disagreement is the feasible desegregation of schools currently receiving aid and the extent to which these schools are achieving desegregation.

Conclusions and Recommendations

The studies of federally funded magnet schools are conflicting and lead to the question which must be asked; Can magnet schools be used to effectively eliminate desegregation while bolstering student achievement? The answer to this question is an emphatic, yes. A study must be performed to draw awareness to the Magnet Schools Assistance Program's funding efforts and ensure its grants are being used properly. An evaluation of a willing school district's enrollment, which currently receives government aid towards desegregation, is necessary to determine the actual effectiveness of the program. Performance indicators for the school need to be established to include the following : a complete report of enrollment status at the end of every semester, community acceptance surveys to be conducted once a month, and student academic progress to be reported at the end of each semester.

By demonstrating the actual numbers towards achieving desegregation, a better assumption can be made concerning the effects of the program. The community survey would ask the questions : Are you pleased with your student's progress at the public magnet school? Do you have any complaints regarding the busing of your child? Do you have any suggestions of how the current procedures could operate better? These surveys would be taken to the school board; and actions could be taken to rectify any problems. This alone places the power of public education in the hands of the community. The people in the community are responsible for the education of their young. If there are no complaints about the busing of children, then the problems dealing with housing patterns are non-existent. The performance indicator for academic progress would verify the combination of desegregation policies with student achievement.

After gathering all of the information, an analysis would be conducted to check for validity. The enrollment status of the school would be a completely reliable statistic. An examination of the community survey's must be performed to determine the ethnic background of those participating in the study. The amount of surveys submitted to the school board would be proportional to the amount of black/white students attending the schools. A random selection process would be implemented to discard any extra surveys, if deemed necessary. Student performance would be based on school records involved with attendance, drop-out rates, participation in clubs and sports, academic progress, and enrollment in advanced classes.

In summarizing the results, an emphasis will be placed on the community acceptance surveys. Problems currently existing with the magnet school programs stem from the community's disenchantment with the established system. If a significant portion of any part of the community submits complaints, the federally funded magnet school will be considered unsatisfactory. However, if a major portion all segments of the community are pleased with the school, the other performance indicators will be reviewed. An analysis would then be performed on the school enrollment to determine the effective elimination of segregation. A final review of school performance will be the determining factor of the effectiveness of federally funded magnet schools at eliminating desegregation while bolstering student achievement.

Threats of internal validity include the ineffective analysis of federally funded magnet schools across the country. The research of one school would not be enough to determine the quality of the entire project. Problems may also arise in the collection and review process of community surveys. Timely measures must be taken to ensure that all viewpoints would be accurately represented in the submission of the surveys.

Suggestions for the future of the Magnet Schools Assistance Program include the requirement of an explanation for the exact use of the funding, as well as a demonstration of results achieved from the funding. The federal program must avoid giving grants to magnets with established racial requirements for schools. The local education agencies must involve the entire community in deciding to pursue the magnet program. A lack of community involvement has resulted in the granting of funds to areas where desegregation is almost impossible. It has also led to embittered feelings about magnet programs because of extreme busing measures. The success of magnet schools is necessary if American society continues its thrust toward desegregation. As the population of the United States continually becomes more diverse, education reform with regards to desegregation in schools is crucial to our country's future.

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THE ENRON DEBACLE

Written By: Priyadarshini Mukherjee

EXECUTIVE SUMMARY

OBJECTIVE

To study the impact of the entry of foreign multinationals in the infrastructure sector of India. And also to study the financial and ethical considerations of their entry in the present political climate with specific reference to the Enron Global Power and Pipelines Project at Dabhol, Maharashtra, India.

INTRODUCTION

The end of the Cold War has resulted in a shift in the global trading paradigms. South Asia which accounts for 20% of the world's population has become an important market for the West. The lack of an adequate infrastructure in the core sectors of power, energy, transportation, communications, in these developing countries, has incited American and other foreign companies to dive headlong into the second largest market in the world, in terms of population and fifth largest in terms of purchasing power parity (PPP).

THE PROBLEM

In 1994, a severe drop in foreign reserves, due to the fluctuating money markets, led the Federal Government to woo companies to invest in fast-track projects, which would inject essential dollars into the Indian economy. On account of the same political party the Congress being in power at the State and the Center, the Enron Project at Dabhol, was cleared in a record time of ten days. A change of Government with BJP, a nationalist party, coming to power at the State level led to a review of the viability of the power project. And which ultimately led to the dismissal of the project on the basis of a high tariff rate, allegations of bribery and lack of transparency.

PRESENT SITUATION

Enron Global Power and Pipelines have begun proceedings on arbitration, since \$300 million has been invested in the project. But, the company was ready to negotiate to prevent long drawn out wrangles with the Government. The project is back on track with a revised tariff rate and an appeased State Government.

CONCLUSION

Competitive bidding and high entry costs should be the basis for allocation of large infrastructure projects and the price per unit of power can be taken as the standard for the viability of large scale projects instead of the capital cost requirements. Political parties in India can jeopardize the economic reform process, due to their pandering to vote banks. Foreign investors may run shy of investing in India due to the adverse publicity. Investing in India has the lure of 'big money', but to achieve that end an investor must have monumental patience.

Introduction

Enron Corporation

Enron is a Houston-based oil and gas company, involved in gathering, transportation and wholesale marketing of natural gas; exploration for and production of oil and natural gas; production and marketing of natural gas liquids and refined petroleum products; the development of natural gas fired power plants internationally; and the non-price related purchasing and marketing of long-term energy related commitments (Standard & Poor's Stock Reports and business summaries, 830J).

Enron Operations Corp. operates a 44,000-mile pipeline system on two continents that extends in the Mid-West from the Canadian to the Mexican border, and in the South from the Florida peninsula to California. Enron also holds an interest in an Argentine pipeline company. Enron Gas Services is involved in natural gas marketing, power services and liquids marketing, domestic power development and marketing, and producer finance activities in North America.

Oil and gas exploration and production activities are conducted through 80% owned Enron Oil & Gas Co. (EOG). For international businesses, excluding EOG, Enron International develops integrated natural gas and power projects, and the marketing of natural gas liquids. [Appendix A]

Jan. '95

The company signed a letter of intent with Qatar to develop a \$4.0 billion project that would ship liquefied natural gas to India.

Enron Global Power and Pipelines L.L.C.¹

Enron Global Power and Pipelines (EPP) was formed in 1994 by Enron Corp. to acquire, own and manage power plants and natural gas pipelines located outside the U.S., Canada and Western Europe. The company's initial projects, contributed by Enron Corp., consists of 50% interest in a 116 MW power plant in Subic Bay, Philippines, a 110 MW power plant in Puerto Quetzal, Guatemala, and a 25% interest in Compania de Inversiones de Energia S.A. (CIESA), which owns 70% of the gas of Transportadora de Gas del Sur S.A. (TGS), owner and operator of a natural gas pipeline system in Argentina.

In its initial public offering on November 15, 1994, EPP sold 4,700,000 common shares at \$24 each and Enron Corp. sold 4,000,000 EPP shares at the same price. Enron Corp. controls about 58% of the stock. Under a purchase agreement, Enron Corp. has agreed to offer to EPP, at prices lower than those available to third parties, all of its ownership interests in any power plant and natural gas pipeline projects developed and acquired outside the U.S., Canada and Western Europe, but only those that commences commercial operations prior to 2005, subject to certain exceptions. The agreement also designates four development stage projects, consisting of Enron Corp.'s ownership interest in three power plants, one each in the Dominican Republic, China and India, and a natural gas pipeline in Colombia (Standard & Poor's stock reports and business summaries, 830N). [Appendix B]

The Dabhol Power Plant (DPP)

The new reformist government led by Prime Minister Narasimha Rao was cash strapped in 1992 and desperate for foreign investment in the infrastructure sector (BW, Sept. 4, '95, p.52). An Indian business delegation visiting the United States to woo American investors met with Enron officials, who smelling a mega-opportunity sent executives to India to explore the possibilities of setting up a power plant.

May '92

EPP and the Indian Government hammered out a Memorandum of Understanding (MOU) to build a \$2.8 billion, 2015 MW power plant, at Dabhol in Maharashtra, in 10 days (IPS Report). The Congress(I) was the party in power both at the State and Center, i.e., Parliament.

Nov. '93

The Maharashtra State Electricity Board agreed to buy 90% of the power that Dabhol would produce (BW, p.52).

Feb. '95

During the Maharashtra State election campaign, the opposition party, BJP, called for a reevaluation of the Enron Project (BW, p.52).

Mar. '95

The BJP comes to power in Maharashtra defeating the Congress (I).

Aug. '95

The BJP lived up to its promise and set up a review panel to study the feasibility of the project. On Aug. 3, '95, the panel presented its report to the legislature stating that the project should be abandoned (IndiaWorld Headlines).

The Lure of India

In July 1991, India initiated a wide ranging program of economic reform. The Finance Minister, Dr. Manmohan Singh was given the mandate by the Indian Prime Minister, Mr. P.V. Narasimha Rao, to improve India's position in the global markets. Sweeping changes were carried out in policies relating to virtually every sector of the economy -- trade, industry, foreign investment, finance, taxation and public sector (The Indian Embassy, Washington). These changes initiated a fundamental shift in economic thinking in India. Nehruvian socialism, with its xenophobia and distrust of markets, is a thing of the past. Today, the economy is growing, inflation is down, foreign investment is creating jobs and competition is making goods and services more affordable (Wall Street Journal, May 25 '94).

The Indian economy is characterized by steady GNP growth, moderate levels of inflation and a comfortable foreign exchange reserves position. GNP has been growing at 5.4% per annum over the last decade. Per capita incomes have registered an annual growth rate of 2.7% despite population rising at more than 2% per annum (The Indian Embassy, Washington). India is the fifth largest economy in the world and the second largest among developing nations according to the purchasing power parity (PPP) calculation method popularized by the IMF (World Bank Development Report).

Import barriers have been radically brought down and tariffs reduced. Capital markets have been opened to foreign investment and measures to further strengthen and develop the markets have been launched. The tax structure has been simplified and rates reduced. The new economic policies have substantially relaxed foreign exchange controls (The Indian Embassy, Washington). India has become a signatory of the Uruguay Round of the General Agreement on Tariffs and Trade. [Appendix C]

1. Enron Global Power & Pipelines, Enron Development Corporation and Enron's international unit has been used interchangeably in this report.

Aug. '93

The Rupee is made convertible on the Current Account and India moved to IMF's Article VIII status (The Indian Embassy, Washington).

Feb. '94

India gets a boost of confidence at Davos World Economic Forum. Foreign Direct Investments (FDI) get a boost at Davos (Anrich, Hyderabad, India).

March '94

US moots the forum to strengthen bilateral ties (Anrich, Hyderabad, India).

April '94

World Bank reports forecast a 5% growth rate for the Indian economy.

Sep. '94

Overseas Corporate Bodies allowed to hold 100% stake in companies engaged in or proposing to engage in infrastructure projects (Anrich, Hyderabad, India).

Due to the tremendous profit and growth opportunities that India's developing power sector provides, US exports of energy-related goods to India have increased rapidly, reaching \$460 million in 1993. US exports, in this sector, are likely to increase several folds in the next few years because of the share of US equipment in the capital cost of huge power projects is as high as 35-45 percent (Big Emerging Markets). Doug Wolford, GE's Manager for Communications and Public Affairs, says that the very lack of an infrastructure offers India and, not incidentally, GE an unprecedented opportunity.

PROSPECT FOR US ENERGY SERVICES IN INDIA 1994-95			
SECTOR IDENTIFICATION	US SALES '94 (\$ MILLION)	US SALES '95 (\$ MILLION)	ESTIMATED GROWTH (%)
Port Construction	7	15	114
Oil/Gasfield Equipment supply	31.8	45.6	43
Refinery/Petrochemical Equipment	52.5	68.2	30
Energy Conservation	10	12	20
Renewable Energy Equipment	4.6	5.3	15
Source: US&FCS India, June 1994. US Department of Commerce, Economics and Statistics Administration.			

India's Power Requirements

The key infrastructure areas of power and telecommunications are experiencing rapid growth. China and India are expected to account for 40% of global growth in power capacity (BW, p. 52). According to the World Bank Development Report electric generating capacity increased from 5580 MWh in 1960 to 286,045 MWh in 1990, but to compliment the present industrial growth rate, the actual electricity generating capacity should be 20% higher.

Modernization and expansion of energy facilities are the Indian government's first priority. The demand for electric power in India exceeds supply by 9%, and peak demand exceeds supply by 20%. The chronic shortage of energy, leading to frequent power failures and brownouts, threatens India's economic growth. As a result, the government plans to exploit energy resources more efficiently and install enough generating capacity to double the available power supply in 12 years. By 2007, India plans to have increased power generation capacity by 140 gigawatts (GW), at a cost of roughly \$160 billion. Although India is likely to fall short of its ambitious plans through a shortage of capital, the potential for US imports is tremendous for both large and small firms.

Energy imports, a significant drain on foreign exchange, have increased steadily to 40 million tons of oil equivalent (MTOE) in 1993. The Planning Commission projects that commercial demand, fueled by growth in industry and transportation use, will increase from 150 MTOE in 1994 to 350 MTOE in 2009. Investments are needed in oil and gas, pipelines and port facilities for liquid natural gas, refineries, coal and coal washeries, power transmission, and refurbishment of inefficient plants.

The country's major shifts in investment and trade policy is succeeding in attracting investment by foreign firms. Private companies have submitted bids for 77 power projects, totaling some 32 GW of capacity at an investment cost of \$33 billion. The government has designated eight of the projects as "fast track," eligible for counter guarantees of 16% return on equity or higher depending on the load factor. Seven of these projects, totaling some \$5.7 billion, involve US firms as partners (Big Emerging Markets, UN Publications).

Among the Indian States, Maharashtra has the fastest growing industrial belt, and therefore the power requirement is higher in this region. The Western power grid has already crashed twice this year resulting in lost revenue, due to reduced number of man and machine working hours. [Appendix D]

Why did Enron enter the Indian Infrastructure Sector?

Since 1988, Enron's sales have doubled, and earnings have expanded 15% annually for the past four years. Enron had scored big successes in Britain and South America, and many major projects were in the works around the world. Together, Enron is involved in discussions on some \$10 billion in power plants and pipelines in South America, Asia, and the Middle East. Enron's international-power unit with, Rebecca P. Mark as its Chairman and CEO, is expected to contribute \$180 million in pretax profits, 16.5% of Enron's total, vs. 4% in 1992 (BW, p. 52).

In the US, gas prices are depressed and most of Enron's growth potential is in foreign markets. It has already successfully built and operated small power plants in the 100-200 MW capacity in emerging and mature markets. Net income in June 1995 was up 24% to \$94 million due to dividends from Britain's Teeside plant and other projects (BW, p.53). To keep stock prices at their present levels and maintain a similar growth graph for its profits, Enron must complete projects and sell off stakes after completion. According to the Standard & Poor's business summary, to maintain present levels of growth, Enron is dependent on the power plants being developed in India and Trinidad. Many of Enron's power plants around the world are in trouble due to squabbles over financing or prolonged negotiations. [Appendix E]

Enron is also counting on India to be the primary market for a huge processing plant for liquefied natural gas (LNG) that the company is building in Qatar. Mobil Oil Corp., which already has built a similar plant in Qatar, has rights to the biggest LNG markets, such as Japan and South Korea. Tax holidays and other federal incentives for power plants made the prospect very attractive. Also, being selected as a "fast-track" project relieved the company of some of the bureaucratic hassles involved with receiving industrial licenses. The Indian Government provided a 'counter guarantee' financing arrangement for these "fast track" projects.

South-Asia accounts for 20% of the world's population and the countries in this region are on the threshold of exponential growth. The pioneers in these markets will capture marketshare and have a head start over late entrants in these fields. Also, the corporate growth rate and profit margins offer a feasible alternative to the stagnating home markets. [Appendix G] And Enron's major focus had to be mega-projects, which is what it presently needs to meet financial targets and to keep its investors happy.

Why Did Enron Fail?

Enron entered a foreign market in a hurry to grab an exciting opportunity, which is how successful companies operate, but it did not attempt to read the prevalent political climate in the country and several other factors. The reform process had given an impetus to foreign investment in the country. Unfortunately, PEPSI, one of the first high profile American companies to enter the Indian market faced an ugly media onslaught against foreign multinationals. Pepsi eventually consolidated their position and gained a firm hold on the Indian carbonated drink market before its arch rival Coca-Cola entered the foray. Then again, the operations of the infrastructure sector and the consumers' non-durable goods sector are far cries from each other.

Enron failed for the following reasons:

1. It did not take into consideration the changing political climate, which perceived foreign multinationals to be milking India of its resources - a fall back to India's colonial experience with the British.
 2. Enron did not heed the sounds of protest and carried on with the construction of the plant, thinking that would make it difficult for the new government to unwind the deal.
 3. Enron sought the intervention of the US State Dept. to issue a statement. This had adverse effect on the situation. Indian politicians attacked the statement as an attempt by Washington to bully India.
 4. There was no competitive bidding to award the project and a lack of transparency.
 5. Although India is the second largest market in the world and the fifth largest economy in terms of purchasing power parity, 50% of the population lives below the poverty line.
 6. Allegations of political clout and covert action by Enron officials to win contracts in other countries.
 7. Enron did not enlist an Indian partner.
- The nationalist forces in the country were gathering momentum with the BJP at its fore and State elections for Maharashtra were slated for April '95. The BJP on the look for an election agenda, locked onto the Enron Dabhol Project - "*the proverbial foreign multinational trying to bleed India financially.*" The public until now had been denied the details of the MOU and the final contract, and Enron fought hard to keep it confidential. A law suit finally prevailed upon them to disclose all information. The lack of transparency added fuel to the already burning passions. India has long been a Socialistic Government and all Indians take pride in their self-reliance. The BJP exploited this sentiment of the people as well as a growing disillusionment with the ruling party to win the elections. And then Enron plant was ordered to be shut down as the Review committee appointed by the new State Government considered the project unfeasible citing high tariffs and allegations of bribery (Malaysian News Agency). Also the rate of return for large projects usually quoted at 16% was 23% for the Enron project (BW, p.53). This brought forth allegations of kickbacks paid to Congress officials by Enron.
 - An US State Dept. source familiar with the Enron drama quoted in Business Week says, "*Enron just blasted on. Public perception just did not concern them.*" Enron invested \$200-\$300 million in the construction of the power plant. This gave the impression that the Indian viewpoint did not bother them. Environmental groups and local consumer bodies' rhetoric were brushed aside.
 - India-US trade relations have been strained over the years as India (a 50-year-old democracy) was placed on the Special 301² list (for trade restrictions), while China (an authoritarian State) got Most Favored Nation (MFN) Status (Embassy of India, Washington). India receives only 0.3% of total US foreign investment, while China receives \$10 billion. Therefore, when the US State Dept. of Energy issued a statement warning that killing the Enron deal would adversely affect other power projects (BW, p.53), it was interpreted as a threat by the politicians and the people and compounded Enron's problem.
 - Competitive bidding for large power plants was not mandatory in 1992, when the MOU was signed. The Ministry of Power stated that after Feb. 18 '95 any MOU signed by the States with independent power producers (IPPs) would not receive the Central Electric Authority's (CEA) approval (Business Line, Oct. 16).
 - Although the World Bank and IMF reports say that India has the largest middle class of 300 million in the world, the actual purchasing power of this segment of population is one tenth that of the American middle class says Ranganath Nayak, Senior vice-president of Arthur D. Little (Insight Magazine). And if the ability to buy a car or refrigerator is the criterion, then millions are excluded from the category (Insight). Also, all of the eight fast track projects cleared for speedy implementation by the Government are perceptibly more expensive than the 50 private power projects now being appraised for which competitive bids were invited. The average cost per MW of the eight "fast track" projects is about \$1.6 million, while for the 50 latest projects the cost is just more than \$1 million per MW (Jha, The Hindu). [Appendix F]
 - Pratap Chatterjee's report on the IPS states that Enron has used its numerous contacts and highly placed sources to bag contracts around the world. Frank G. Wisner, the present ambassador to India, was the Ambassador of Philippines when Enron signed a contract for a Filipino power plant. Kenneth Lay, the CEO and founder of Enron, is George Bush's neighbor. Although Mr. Bush has never been mentioned in connection with Enron, it has been reported that his sons have helped the company. Neil and Marvin Bush were named in an article in the New Yorker magazine by investigative journalist Seymour Hersh as having tried to influence Kuwaiti officials in favor of an Enron bid to rebuild Shuaiba North, a power plant destroyed in the Gulf War. In 1988, George W. Bush, another Bush son, now Governor of Texas, reportedly telephoned Rodolfo Terragno, Argentina's Public Works Minister, to ask him to award Enron a contract to build a pipeline from Chile to Argentina (IPS Report). Rebecca Mark, the head of the Enron Development Corp., at a press conference in Bombay, India, denied an IPS report that Enron used political clout to swing deals. These reports and queries did not endear Enron to the Government or the media.

Enron made the mistake of not teaming with an Indian company to enter the Indian market. Enron's only co-investors were General Electric Co. and Bechtel Group, both US companies. Enron had also arranged to sell a 20% stake in Dabhol to New Orleans-based utility Entergy Corp., which would have drawn more ire (BW, p.53). The absence of a joint-venture created the impression that the foreigners were milking India. Another point of view presented by Mr. Jha's article in The Hindu, which states that, "*although bribery is rampant in India only the manifestly foreign companies that have not taken Indian partners with them seem to be targeted for attack (whether justified or not).*"

PRESENT SITUATION

Aug. '95

Enron threatens to begin arbitration proceedings against the Maharashtra State Government (IndiaWorld Headlines).

Sept. '95

Enron begins arbitration proceedings. Construction of the plant is at a standstill. Maharashtra does not budge from its position. Enron agrees to renegotiate the price stated earlier (IndiaWorld Headlines).

Oct. '95

The Government abolishes the system of providing counter guarantees to power projects except for the eight "*fast track*" projects already given the green signal (Business Line, Oct. 25). The Maharashtra Government set up a 3-member committee to hold talks with Enron Development Corporation (EDC) to revive the Dabhol power project. The issues are reduction of capital cost, tariff rate, environment pollution and issue of Dabhol Power Company's share at par to the Government (Business Line, Oct. 31).

Nov. '95

Major power failure in the three States of Maharashtra, Gujarat and Madhya Pradesh due to the collapse of the Western powergrid following a fault in the 4000 MW power generating station of NTPC at Bhilai.

Enron Development Corporation has indicated its willingness to drop arbitration proceedings provided talks with the expert committee yield positive results (Business Line, Nov. 1).

Maharashtra Government confident of reducing the tariff rate of 72¢ and also the capital cost of the project by Rs. 15000 million (\$1 = Rs. 35). Maharashtra State Electricity Board's thermal power station at Bhusawal trips and paralyzes life in Bombay.

Conclusion

In all this hullabaloo over the Enron issue, there were very few voices raised in the media or among politicians that the deal once made should be honored no matter how difficult this may be (Jha, The Hindu). This can be attributed to fear on the part of developing countries that if they make a mistake with mega-projects they will have to live with it for the next 15 years. China has delayed dozens of large, privately financed plants over squabbles about investor guarantees rates of return. Malaysia has even banned new plants to prevent overcapacity (BW, p.52). There are other measures that can be taken to ensure that these projects do not fall into a political and economical quagmire.

- Competitive bidding and higher entry costs should be the basis of allocation of large infrastructure projects and an alternative financing scheme to the 'counter guarantee' schemes should be established.
- Political parties should have economic reforms as their prime agenda.
- Foreign investors may turn their backs on India due to the adverse publicity that the project received.
- Investing in India has the lure of '*big money*', but patience is essential.

The Central Electric Agency has made competitive bidding compulsory for all States from Feb. 18, 1995 to do away with favoritism. The Ministry reiterates that unless a clear letter of intent was issued or an MOU signed before the cut off date, the project will not be considered for techno-economic clearance. Since, the Government's 'counter guarantee scheme' was abolished an alternative financing scheme has to be developed. The Hinduja Group feels that a prerequisite to attract international IPPs or investors/lenders is the availability of enforceable contracts with *project counter parties* of appropriate standing. In the Indian context, the key *project counter parties* are the power purchasers (the State Electric Board) and the fuel supplier (for instance, Coal India Limited). Unfortunately, both these *counter parties* remain in State ownership with low credit standing. Therefore, credit enhancement would be necessary in order to secure overseas investment in the private sector (Business Line, Oct. 17)

Pakistan had a better system in place. While calling for bids from power companies, it did not go into details like capital costs, etc., but followed the rule of "*the price at which a prospective power producer promised to deliver a unit of power*" (Business Line, Oct. 28). Also, *competitive bidding* is not the answer to all problems. According to Mr. Chris Vermont, Director of ANZ Grindlays Bank for international structured finance, Pakistan was able to keep out speculators by asking for a substantial bid or performance bonds amounting to \$1.5 million.

All Indian political parties have committed themselves to the economic reform process, but since 1996 is an election year, the party agendas are being geared to make an impact on vote-banks.

As parties gird themselves to fight the next General Election, there is a real danger that the increasingly reckless postures they are striking in their hope of culling votes could wreck the prospect of a successful transformation for the Indian Economy. India is, therefore, in the worst of all predicaments: its reforms may fail for lack of political support even when each party, left to itself, would prefer them to succeed and if brought to power would continue the liberalization process (Prem Shanker Jha, The Hindu, Jul. 29 '95).

Some political parties in other States of India are questioning power projects with foreign investments to embarrass the Government and not to save the country some foreign exchange! Mr. Jha ends the article with the following words, "***Few Indians seem to realize that today's investors are not conquerors who will go into a country in the teeth of animosity. If the reception is likely to be unfriendly, they will go elsewhere.***" As one observer discussing the Indian business climate in the Insight Magazine, puts it: "This is the ball game these days - complicated deals, endless details, lots of frustration." To which the author adds: And one more thing -- "big money."

US Commercial Consul, John Wood adds a voice of reason, "You can't come to India and make a million bucks in a week." Government barriers have come down, he stresses, but anybody who wants to do business in India needs to be "***a world class hurdler with great patience,***" (Los Angeles Times, May 10 '94).

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Center for Monitoring Indian Economy
<http://sunsite.sut.ac.jp/asia/india/jitnet/india/mea/cmie.html>

APPENDIX A

Income Statement Analysis (Million \$)

	1993	% Chg	1992	% Chg	1991
Revenues	7,972	26%	6,325	-53%	13,520
Operating Income	1,076	10%	981	14%	864
Depreciation	458	27%	361	-1%	366
Int. Expenses	300	-8%	327	-16%	391
Pretax Income	498	12%	446	30%	344
Effective Tax Rate	27%	--	21%	--	27%
Net Inc.	333	NM	336	39%	242

Balance Sheet & Other Fin. Data (Million \$)

	1993	1992	1991
Cash	140	142	217
Current Assets	2,019	2,126	1,805
Total Assets	11,504	10,664	10,072
Current Liability	2,676	2,642	2,280
Long Term Debt	2,661	2,459	3,109
Common Equity	2,474	2,364	1,706
Total Capital	7,555	6,966	6,939
Capital Expenses	688	589	707
Cash Flow	774	675	583

Long Term Debt: \$3,417,664,000 (9/94).
Minority Interest: \$202,646,000.

	Revenues	Profits
Enron Operations	35%	50%
Gas services	53%	20%
Domestic gas processing	1%	3%
International gas & electric	7%	12%
Exploration & production	4%	15%

Source: Standard & Poor's Stock Report and NYSE

APPENDIX B

Income Data for the year ended Dec. 31, 1993 (Million \$)

Revenues	32.4
Operating Income	25.9
Capital Expenses	NA
Depreciation	Nil
Int. Expenses	NA
Net Before Taxes	25.9
Effective Tax Rate	8.8%
Net Income	23.6

Balance Sheet Data for the year ended Dec. 3, 1993 (Million \$)

Cash	4.88
Current Assets	56.8
Current Liability	56.6
Ratio	1.0
Total Assets	205

Source: Standard & Poor's Stock Report and NYSE

APPENDIX C

Important Indicators on Indian Economy

	1990	1991	1992	1993	1994
Exchange Rate (US \$)	18.0732 17.5035	25.8338 22.7424	26.2000 25.9181	31.3800 30.4933	31.3800 31.3737
Wholesale Prices (Index)	100	113.5	127.0	136.4	150.8
Consumer Prices (Index)	100	113.9	127.3	135.4	149.2
Change in Consumer Price (%/annum)	8.97	13.87	11.79	6.36	10.21
Industrial Production (Index)	100	101.6	104.5	106.5	116.1

Source: International Monetary Fund (August 15, 1995)

APPENDIX E

Enron's Global Scorecard

Country	Project	Cost \$ Billions	Status
Bolivia/Brazil	1,120-mile liquid-natural-gas (LNG) pipeline	3.0	Delayed by feud between World Bank and Brazil over foreign ownership
China	Build and opearate 150 MW plant on Hainan Island	0.1	Under construction
India	Two-phase 2,015 MW LNG-fired plant in Maharashtra	2.8	Canceled
Indonesia	Build and opearate two LNG-fired plants	0.7	Negotiations stalled
Philippines	Two small power plants in Subic Bay and Batangas	0.1	In operation
Qatar	Plant to process 5 million tons of LNG	4.0	Negotiations under way but viability questioned
Turkey	480 MW plant in Marmara	0.5	Negotiations ongoing

Source: Business Week, September 4, 1995

Data: Saloman Brothers, Inc., Company Reports

APPENDIX G

Overall Performance of Corporate Sector

Growth

For a frame of reference, inflation over these years has been running at roughly 9%.

	1989-90 (Billion Rs.)*	1993-94 (Billion Rs.)*	Average annual growth (%)
Sales	867	1623	17
of which, Exports	50	146	31
Value Added	161	328	19
Operating Profit	115	246	21
Net Profit	32	91	30
Net Worth	237	671	30
Gross Fixed Assets	525	1151	22
Total Assets	774	1743	23

Key Ratios

	1989-90	1993-94
Sales / Total Assets	1.17	0.98
Debt : Equity	1.29	0.88
Operating Profits / Sales	13.30%	15.15%
RONW	15.56%	15.58%

Abbreviations: RONW: Return on Net Worth / *\$1 = Rs. 35

These figures show that starting operations in India can have tremendous impact on the Company Balance Sheet.

Source: Corporate Finance: Industry Aggregates, Centre for Monitoring Indian Economy, Bombay (November 1994)

(Editor's Note: Appendix D and F are pie graphs of data previously presented.)