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"CORRESPONDENCE TRACKING"

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DOCUMENT NUMBER: 9120839

FROM: KIANG, Lindsey: DIGITAL

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 03/14/91

SUBJECT: COMMENTS ON THE TALK GIVEN ON U.S. TECHNOLOGY POLICY
AT THE KENNEDY SCHOOL.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

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DATE COMPLETED:

COPIES TO: D. Allan Bromley
Thomas Ratchford

WHITE HOUSE TRACKING #:

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REMARKS:

DATE RECEIVED: 03/22/91

FILE: *Industrial*
TECHNOLOGY*POLICY

Digital Equipment Corporation
100 Nagog Park
Acton, Massachusetts 01720-3499

9120839

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91 MAR 22 A 9: 52

March 14, 1991

OFFICE OF THE
DIRECTOR

digital

Dr. D. Allan Bromley
Director
Office of Science and Technology Policy
Executive Office of the President
Washington, D.C. 20506

Dear Allan,

I enjoyed very much your talk on U.S. technology policy last night at the Kennedy School; I hadn't seen you since finishing some years ago my appointment at Yale as general counsel.

It was indeed a major achievement to have issued a national Technology Policy, but perhaps not a surprising one, considering who did it. As you probably recall, Bart Giamatti and I diligently "worked" Washington on behalf of the University, and on our regular trips he always made it a point to visit his good friend, the then-Vice President. But did you know that Bart often remarked that he thought you always had the most effective federal relations program of your own?

You commented last night in passing that basic research should be accessible to all, and this perhaps reflects the great tradition of openness in academia. But I have a concern that we are being naive in disregarding the general problem of foreign industrial competitors getting a "free ride" on the science research efforts in this country. I hope that your Office in the future can look more closely at the issue of technology transfer and loss of national competitiveness; this is an increasingly timely and significant national issue, in my opinion.

Again, it was very good to see you last night, and I wish you every success in your very important and exciting post.

Sincerely yours,

Lindsey Kiang
Lindsey Kiang
Senior Counsel

"CORRESPONDENCE TRACKING"

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DIRECTORATE STATUS

FROM: MORGAN, L. Frank

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 03/17/91

SUBJECT: READ THE REFORM PROCESSES THAT HE HAS WRITTEN IN HIS
BOOK

DIRECTORATE STAFF
ASSIGNED: ASSIGNED:

ACTION STAFF
REQUIRED: ACTION:

SENDER'S DUE DATE:
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United States Government
All Federal Branches
Washington, D.C.

17 March 1991

91 MAR 25 P 4: 24

Subject: More Essay on Government Science; re ltr of 1/15/91

OFFICE OF THE
DIRECTOR

Mr. President and Honorable Members,

This also *stubborn* would-be, modern day Thomas Paine is not ready to give up. I know that you are all very busy, but there is no one else to address the problem to. Forgive me, but I owe it to you to persist. The enclosed new chapter might just "knock your political and intellectual socks off!"

It is my sincere wish that the incumbency which you currently represent, and which I wholeheartedly support, will take the initiative in the revolutionary reform processes being suggested by my essay. And I accept that you may already have in ways that I am not aware of. I know that results will be achieved much sooner and with much less pain in such event.

It is remotely possible that the power of these ideas is likely to take off with the media and those who are prominently standing by on the outside ready to move into incumbency. They may have a good chance of catching fire in time for the '92 elections.

You have just made us the Great Champion of Necessary Evil in the world. You had my full support and now have my congratulations. My essay suggests that we can now use that foothold to find a way to become the Great Champion of Necessary Good in the world. And, by the way, I concede that you are already trying to do so.

Why is it that throughout history, science and engineering has been explicitly and persistently allowed only to make the military (defense) element of government smarter? Maybe Mr. Sununu or Mr. Bromley might answer this one.


L. Frank Morgan
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cc: same distribution as letter of 15 January

THE RULE OF LAW

Functional integrity of government is prerequisite to ultimate spatial and temporal integrity. Under "Basis of Government Organization", the functions of legislative, judicial and regulatory were taken from the modern evolution of government as applied in the USA. As defined and used thus far, these three functions represent an application of common sense concepts embodied in the phrase, "the rule of law". How do you tell when a given application of the rule of law yields functional integrity?

In applying the rule of law around the globe, the most visible functional shortcoming has been the failure to achieve a balanced, high degree of both efficiency and humanity. In terms of derived government science parameters, it is the combined difficulties of: (1) achieving equally high levels of Response and Sensitivity as experienced by the majority of citizens, and (2) having Utility remain much less than it should be because of systemic problems with Cost.

The main contention herein has been that we are still a long way from where we can, should and must be with respect to government functional integrity in applying the rule of law. There is always the inadequately dealt-with concern too, that the necessity for majority-based tuning can result in unjustified and persistent unfairness toward minorities. It is possible, even likely, that the indelible set of rules chosen at the onset are, in context at least, synergistically biased toward an incumbent majority.

The questions still to be addressed by government science regarding functional integrity are: (1) how do you measure rule of law effectiveness from the standpoint of least expenditure or conservation of resources, i.e. determine ultimately achievable utility levels or how much rule of law is enough?, (2) how do you ensure maximum contextual fairness of the rule of law with respect to struggling minorities in a democratic free enterprise system; i.e. how do make sure that unanimity of rule, as opposed to limited majority, is a possible dream?

First of all, one needs a fully conscious grasp of what is truly implied by the term, rule of law. The author finds it to be a bit more slippery than one might be inclined to suspect.

If Necessity was the mother of invention, then Incumbency might be considered the father of the rule of law. To fully understand why and how, one may review where our long commitment to the rule of law has unconsciously brought us, and is yet to consciously take us.

The rule of physical law and the incentives of nature have been, until recently, self-enforcing. The laws of gravity, mechanical force and electricity, which we utilize profusely every day, are organically embedded. We have generally not been allowed the

conscious choice of going against the laws of physics. In a few instances, however, we have successfully challenged the natural balances there too. For example, nuclear energy processes that overcome the normal states of physics at the subatomic level, to artificially create energy release and radiation hazards of potentially horrendous consequences, are invoking new rules and regulations. Such new law, requiring extensive monitoring and deliberation, has, in effect, begun the process of augmenting or replacing physical laws that once kept us in check.

The incentives of ecology, though once equally effective at influencing our behavior, have been weakened also by modern technology and lifestyles. Few of us, now, are diurnally driven by basic instincts to operate or feed the cyclic pumps of nature that create and sustain our natural habitat. Our niche, if we ever had one, is now so broad, deep and variable that we ourselves cannot define, nor would we limit, our envelope. We are now forced to invent rules and incentives to support nature, and to avoid toxic insulation from, and inoculation to it.

Recent advances in biotechnology are now presenting difficult questions of legislative control which govern matters of life creation previously assigned strictly to the realm of the Almighty.

In order to better focus our destiny, and even to survive at all in the long run, it is our nature to incorporate or supplant natural law according to our own will. We are, indeed, driven to vigorously codify and control; i.e. to rule and otherwise constrain both the behavior of life and the natural elements in which it is immersed.

We compulsively codify and control in all spheres of organic life, through unconscious as well as conscious government at many levels; the organelle, cell, organ, individual, family, social club, business and religious group, community, city, county, state, nation, globe, and slowly but surely, the universe.

Thus far, our collective objective system has faithfully codified the natural laws of evolution without major modification. This may have been sufficient for awhile, but it seems clear that we have now reached a point where we need badly to supplant the natural law embedded in our rule of law process. Long ago, the rule of law grew to become a complex societal game that many can ill afford to play.

The rule of law, as evolved thus far, may be aptly referred to as a game because it has winners and losers, and it is the winners, by and large, who get to make and change the rules.

Some of the more important rules, the contextual ones, are largely hidden in that most of us are not conscious of them. A good example of this is the fact that the exercise of freedoms of speech and privacy in the USA and elsewhere, though supposedly protected the same for everyone/everywhere, actually vary widely in practice from community to community. Protection of these and other freedoms also may vary widely on the same spot in the same community at a different

time of the day, or depend on who and how the freedom is being exercised. The common sense context, the inevitable differences and relatively wide leeway of rule interpretation and enforcement, based on human judgement under varying circumstance, simply cannot, and should not be rigidly specified and predicted.

The rule of law, to be humane and equally effective anywhere, anytime with respect to anybody, demands a high degree of unwritten law; a common contextual vision, or sense of what is right and wrong under a wide variety of circumstance. One would hope that the societal context of the rule of law is forever a matter of strongly held general sentiment. To the extent that strongly held sentiment is narrow based, i.e. exists only as a broad variety of hard attitudes and outlooks scattered throughout a society, the rule of law means of a lot of different things within that society.

When there is very little strongly held, and lived, general sentiment, there will be wide variation in the quality of justice as it is actually experienced by the less influential and the more influential. As long as this situation is relatively pervasive in a society, the rule of law will, and likely *must*, contextually serve to protect the powerful at the expense of the less powerful.

The consciousness with which the rule of law has evolved is limited because it is intrinsically biased toward the incumbent powerful and the clever manipulators among us. After all, they are the strong, the synergizers, the evolvers, the ones who have thus far caused us to function as an integrated society and to propagate our way of life.

By definition, it was incumbency that first agreed to, formulated and arranged for the enforcement of the rule of law. They first understood the advantage that the rule of law held for them, and then the advantage that it offered to a society as a whole. Not that incumbency is necessarily mean or lacking in humanity and altruism. On the contrary, the very fact that incumbency was first achieved without the benefit of rule of law meant that their consciousness was sufficiently raised, relatively speaking, to embrace compassion and conscience. Incumbency, after all, means that one feels and acts on the basis of obligation. They were and are allowed or selected to lead because they are perceived as the more responsible among us.

Where every one, every group cannot be a winner, the incumbent "fittest" *should* control and have the highest quality of life because that's how the species and society best survives to ultimately improve everyone's existence.

But what should happen when and if a society develops to the point where everyone can be a winner? What has to happen if the people's consciousness is sufficiently raised to where they all can begin to see clearly that it is possible for everyone to either experience the highest quality of life, else make it impossible for everyone? How does incumbency then address the people's aspirations? How do they begin to take enough trial and error, enough of the accumulated waste, cheating and clutter out of the "system" to allow these

aspirations to be fulfilled. How do they take the last intricate, insidious vestiges of the law of the jungle out of modern rule of law?

It may be hard to swallow, but evolution, or nature, *never* knew anything of morality and fairness. These are the unique artifacts or manifestations of elevated human consciousness. Natural evolution may even give a big edge to the natural cheaters. Too much consciousness and it's inevitable burden of conscience can interfere with the natural selection and adaptation processes of evolution.

Many humans for a long time to come, both winners and losers, may not be able to go sufficiently beyond natural instincts to share fully in a modern social contract. Part of the unique reality and burden of most incumbency, the majority of the winners of human evolution, is this unspoken truth. The timing and possibilities for the millennium rest on how incumbency ultimately resolves such truth.

A conscious and capable lifeform with a developed collective conscience has a reverence for all life, and feelings for the weak, disabled, oppressed and dying. As these conditions become more visible, if not more prevalent, we more often sugarcoat, coddle, empathize, endlessly mitigate and litigate. Some impulsively sacrifice themselves to help those in desperate need. Most, however, limit conscience to lip service, yet grudgingly contribute hard earned wages so that government, the church and charities can provide limited services. On the whole, however, we still unconsciously do what we have to do to propagate the perceived winners of our species.

The losers are left to the sidebands of chance, to the long-odds of paving the very limited number of successful new trails of trial and error evolution.

When the odds deal you more stress than you can handle just to respond to the immediate demands on self and family, the ability to focus consciousness at a higher level is not only superfluous, it is dangerous. You may be forced to go on instinct, by the hour, to survive at all. The collective rule of law, or parts of it, may then be just another oppressive and hostile part of the external that keeps you down and hurting. Instincts, as always, will statistically work in the upshot to serve the interests of the fittest, by the rules of the existing fittest.

The accidentally more capable, more talented and more attractive seem to invariably find the self esteem to raise consciousness long enough to become a winner at playing the game of rule of law. Some remain winners for only a short time. Many find it too easy, once with power, to avoid that further level and aspect of raised consciousness which weakens enjoyment and retention. They find it easy and essential to fervently believe in and defend the system as it is, or very nearly so.

The accidentally bad and inept, the accidentally untalented and ugly, the painfully honest and humble, the indigenously unpowerful of modern

society should, without anyone having to admit and say so out loud, be happy that they are tolerated, compassionately supported, and controlled by the powerful.

If all this is a little nauseating, congratulations, you are a winner among winners. You also may be a candidate for the belief that we need to begin supplanting evolutionary trial and error, our game called the rule of law, with government science. Evolution can no longer be supported by human conscience without more substantial modification. Life does not have to be unfair, and we should no longer accept that it is, in so many ways for so many.

An intelligent lifeform in full control of it's destiny should be able to make the rule of law more positive, and less negative, in terms of moment to moment impact on the many. We can, indeed, be 'a more gentle and more kind nation'.

When government science is the only game in town, everyone can be winners because it becomes clear that there is enough to go around for everyone and that we have the conscious option of a lucid common vision of how and when there will be more than enough to go around. The camouflage and unnecessary proliferation, the commercialization and codification of uncertainty and fear, the self perpetuation of the powerful, will then no longer act as insidious drivers of our rule of law process. Government agencies will not be able then to accrue so much power that they can, or even have the arrogance to suggest that they can, grant empowerment to certain private citizens or groups while denying or diminishing it for others.

Government science may someday be the only way a modern society of individuals can responsibly maintain control of their government; i.e. quickly and effectively empower and disempower via the voting process to ensure consistent positive feedback.

In the meantime, legislative translation of common sense rules and incentives into legal code has built a mountainous topology of societal control that stretches around the globe. One may rationally characterize this topology as a crude manifestation of a genetic control bridge that ties us all together, and it's convolutions, as the physical envelope of a primitive, collective brain. The number of rules and their contextual definition and variation, the number of infractions on file, and the endless patterns of "due process", recorded and being recalled and exercised on a daily basis, certainly far exceeds the complexity of a single human brain.

While the existing legal structure and operation is an evolving trial and error process for the most part, it is certainly purposive, and quantitative as well as qualitative. Despite, or perhaps because of it's richness and complexity, it is relatively crude, unnecessarily bulky, and very uneven for modern times. It's feedback is also largely negative in character, as opposed to positive.

The evolution of life at the human collective level may have thus far proceeded in the fashion of a large cumbersome, loosely integrated

reptile; exposing itself to ultimate extinction. Collectively, we may lack the plasticity and speed to survive future convulsive changes in our behavior and habitat, including self generated pandemic disease or other catastrophic pestilence. A self generated complex of attached but independent problem-entities now comprise what has been labeled, "the evolution of the unintended". In biology, such evolution has been generally referred to as tumorous growth.

Given enough time in any given place, it seems, uncertainty (entropy) outpaces limited-consciousness intent.

The edifices represented and caused by the civil, criminal and administrative code of modern governments are already so huge and complex that their daily operation, sustenance and growth consumes a substantial portion of the combined global product of human endeavor. The most visible part of this consumption, attributable to formal government, is only the tip of an iceberg.

An almost endless network exists, comprised of interactive private sector elements, including intricate mitigating or bypass mechanisms caused by the rule of law process as practiced daily by the legal community. As a result, essentially hemorrhagic conditions permeate modern human societies. The price of everything includes significant costs related to the rule of law, including the highly sensitized fear and uncertainty of being helplessly and innocently ensnared by "the system".

Insurance and health costs, alone, stemming directly from the codification of fear and the resulting parasitic exercise of complex legal processes, reaches into every family, business and government agency of America with significant daily impact. If we could recover the misspent energies involved here and focus them to solve other critical problems, the millennium might be just around the corner.

So how will government science help us eliminate the accumulated waste and clutter of modern life? First, the accumulated clutter of the rule of law needs to be clearly identified and mitigated because of it is especially insidious. The overall organ in which it is deeply embedded, i.e., government, is more critically needed than ever, and the clutter is so interwoven with fundamental fabric that it cannot be safely excised.

Our situation is the logical equivalent of a collective egocentric predicament which says, "rule of law introspection eventually reaches a blank wall, for when a purposive system attempts to purge itself, it is ultimately blocked by it's own concentrated attempt to purge the very process by which, at the moment, it is using to purge itself". One is moved to apologize for this point of view, but the dangers of too much analysis and not enough synthesis cannot be overemphasized. When limited to holistic approach because it is the only way open, momentary retreats to epistemology ought to be forgiven. The context, the upshot attitude of the rule of law must change first.

A new, more hopeful whole-fabric, or holistic vision of government, needs to be consciously present as a backdrop for difficult surgery; but both the public and private sectors need to know that we need it, so we can rationally prepare. Even then, We may not have enough time nor attain the necessary will of the people to ensure a successful outcome.

We probably have enough laws on the books to keep us going, while we seriously ponder how to do with less. The incentives side of governing (which the holism of nature has always provided) is likely worthy of most of our attention at this time. The easiest part of this process has already begun, and hints at the way to do much more.

The environmental movement has most recently caused government to aid and abet the incentives of nature using both legal code and budgetary legislation. Without the filter of a government science data base, however, not all environmental influence is proving it's worth. Fortunately, technology was long ago incentivized and, by it's nature, has been able to largely prove it's worth before major funds were committed.

The really big problem, of course, is that accumulated waste and clutter has made us run short of money. Our huge economic dilemma came just as we were beginning to see, a little more holistically, how we can and ought to proceed in modernizing the rule of law by making it more positive.

Government science can quickly build an integrated arsenal of smart tools that can achieve the objective targeting, surgical renewal and extraordinary economies needed to modernize the rule of law process. The know-how and technology is largely in place. The only missing main ingredients are the attitude or will, and the holistic vision.

The elimination of unfairness, old wastes and the new solutions representing the needed balance are, for hopeful science anyway, sitting there waiting for the right will and vision. The government science data base of the type discussed herein may be the only way to find and focus the needed ingredients in a democratic society.

As we attempt to build the needed public data base, forced near term economies suggest more reliance on responsible individual or private group actions that lessen the need for government.

A strictly voluntary period of substantially less selfishness and greed may be possible; i.e., a term of high Relative Maturity Factor for a sizable number of us. Such a period might be easily achieved if private and public leadership demand and begin it with their own backyard. They must then present a common vision as to where society has to go and how it will get there. The unspoken honor system of democracy might then be enticed to work better for awhile at all levels of government and industry.

Influential individuals may jump to respond for the best of reasons, because they have the vision and believe it can be achieved only by their help. For that while, the embedded clutter and waste will not matter very much and will begin to dissolve from lack of nurture.

The inevitable voluntary shifts in employment and lifestyle might then be encouraged, quickly accommodated and rewarded.

As human society becomes convinced that we are capable enough to guarantee every one to be a winner, that evolutionary trial and error has done its job, and is now outmoded and not good enough, our consciousness will be sufficiently raised.

The new conscience of the rule of law must bring upon the transgressors, the white hot, instant reprobation of the general sentiment; at least, it should do so more often. The building of this common conscious vision and strongly held sentiment will undoubtedly have to begin with the private sector, and especially the more affluent private citizen. There are many such citizens today who believe that such re-building has already begun and that all we have to do is come together and accelerate it.

The collective conscience of society will be thus made more explicit and updated, to be re-enshrined by a lasting government science and the living generations of the millennium.

Before any of this hopeful scenario can happen, and in the meantime, life must go on for those with very little or nothing more to give, and those in great need. For the rest, confidence must be gained that the approach can be made to work in an even handed manner; that those with something to lose share the burdens equally, so that no one has to expose themselves to relative devastation, or to being a loser.

Suggested government science beginnings for budgetary process incentives, for improving the quality of rule making and enforcing generally, and for the verification of rule of law effectiveness and fairness, are given below.

Majority Home Rule: how much should it apply at lower levels of the synergram hierarchy, and how are variations in quality-of-life reasonably constrained by vertical integration; i.e., by the higher level government constitution(s) and regulatory elements involved?

For example, can/should a state have the sovereignty to tune the rule of law to satisfy the majority of it's citizens, even though that tuning fails to closely match federal level? The answer might be, yes, so long as overall quality of life goals of the nation are being met and the state is contributing its fair share of the burden. It is common sense, however, that the difference in tuning at the national and state levels may result in more or less court case appeals to the federal level, and in a proportionately greater or lesser allocation of federal dollars to the state.

If a state has been enjoying a significantly higher (>15%) than average quality of life for, say, ten years in a row, the allocation for services might be reduced proportionately, taking population into account. Those states having a significantly lower standard of living would take up the resulting slack. That is, they would receive greater allocations of federal funds for services, for perhaps as long as a decade until they either reach the average, or until special programs are carried out to cause correction of the adverse trend.

Similar allocation formulas and or special corrective programs would apply for state funds allocations to the counties, and likewise county allocations to cities and districts.

To use allocated services funds efficiently, a local level needing major catch up, may need to be temporarily tuned more socialistic. A better-off local level may want to tune for more individualism (less dependence on government) to ensure that it's condition is sustained, and possibly improved even more.

How much home rule, or lower level synergram freedom, is just and practicable when there are major, persistent areas of inequality as to quality-of-life within a given level? Can some states or counties be consistently tuned highly socialistic, while others are consistently tuned to maximize individual and private sector group freedom? Certainly it is possible, if the national and state level tuning somehow accommodates it - but how?

A step in the right direction is to have a certifiable way of continuously recognizing what the majority of individual citizens of each level want. They may be satisfied with things the way they are and do not want more government involvement in solving their problems. In other words, the system is able to tolerate major differences in quality of life if the public data system clearly demonstrates that this is what the majority wants at the moment, especially if there is such a majority preference at all or most of the government levels encompassing the problem areas. Certainly, a community, or other smaller spatial level should be allowed the choice to aggressively solve it's own problems with minimum, or no, outside help.

Perhaps the main contribution of the higher level government should be to provide rapid access to objective, larger area data for successfully solving problems at the local level.

In a free enterprise democracy, there is the essential sense of freedom to go where you want. If you do not like the majority values of the place where you live, you should not have to look very long or far to find a place more becoming; a place that you can pick up and go to, or at least aspire to in the relative near term. Regardless of where you go, you are never locked out of responsible participation in all levels of government that effect your life.

One of the simple ways to begin a more fully conscious and compassionate rule of law, is for it to provide greater encouragement for those who, for political reasons, need badly to relocate within their own larger society.

There is the freedom, also, to pursue activism; to try and influence the system so that the majority joins you, or even that you may become part of an influential and receiving minority. In a free enterprise modern democracy, the majority is perhaps best defined as "a current, loosely-coupled coalition of two or more strong minorities". The higher levels of government, wishing to have the potential for successfully creating and sustaining such a society, need the sophistication that government science can bring to bear.

Envisioned here is a government science in the confident hands of: an enlightened political leadership, a professional and dedicated bureaucracy, and a fully conscious and responsible citizenry; each insistent on dynamically tuning the system based on publicly certifiable results and arising needs.

Tolerance for standard of living differences might be necessary from the viewpoint of the majority in order to: (1) maintain a variety of options in lifestyle based on strong independent beliefs, (2) reduce the cost or "meddling" by higher level government. In other words, a given state, county or community could establish their own tolerance levels for economic or crime rate ups and downs within some broader variation limits (both high and low) agreed to at the national level. Only when these tolerance levels are exceeded will the equalizing allocation formulas be triggered. Even then, the people involved could effectively reject or ask for more help by voting to change the tolerances.

The ability to use such tuning mechanisms at various levels, to more precisely follow the will of the people and grant the greatest degree of privacy and freedom, helps provide the extensive plasticity needed by modern government. The highest level constitution, in addition to providing basic common structure and objectives, must also set the broader limits of operation that will, at once, assure optimum integrity of the total societal entity while allowing substantial degrees of privacy and freedom at the lower synergram levels.

The highest level of chaotic freedom of the private sector that allows a predictable holistic outcome is a key element of the optimum government science model of a society. This is the way that the human brain, our own individual objective system, tends to operate. It is the way that permits maximum individual and group creativity and productivity: to continuously nudge society as a whole along the path of least resistance toward generalized quality of life goals.

The principal task of the higher level of government should be to offer natural incentives for going in the general direction of synergy, while making sure that there is energy and productivity aplenty to go anywhere. To the extent that high energy levels of self expression at the individual and relatively small group levels can be

nurtured or simply allowed to self start and benevolently grow, the path of progress for all is more quickly and more permanently paved.

The flip side of this, of course, is that individuals, groups, communities, etc., could consistently elect to have very low tolerance levels for inequity (and relative freedom) in order to maximize their chances for aid from without. This latter situation is much more likely to happen based on past experience, and, if prolonged for a given government level, amounts to a persistent socialistic (lower individualism) tuning for that level; and, perhaps, a persistent activism to project it's tuning to the national level such that all of the more affluent communities recognize the same relative priorities for sharing of wealth.

The more affluent communities, anxious to maintain their affluence, may quickly respond favorably to the sharing of wealth, but only if they can thereby avoid having to politically move in another, less rewarding direction.

In order to provide for the wide variation in local government tuning (i.e. significant variations in the level of home rule), the higher levels of government (e.g. federal and state) must be capable of a balancing act of broad dynamic range. Incentives maintained by the government of a free enterprise, democratic system must include not only an encouragement to fully participate in the social contract, but some balance of rewards and penalties related to the economic quality of participation over a lengthy period of time, say, ten to twenty years. The penalties side of this balance is more difficult to judge and administer, and requires very even handed deliberation as to social contract requirements for citizen and private group long term contribution.

From those likely to need government the least and the most, there is only one good time and place for indelible commitment with regard to standards for long term quality of economic contribution; when originating or amending the constitution at the highest levels of government.

It seems clear that, for modern governments, higher level constitutions should not only set forth indelible basic structure and principles, but a comprehensive set of basic rights and responsibilities expressed in terms of flexible home rule limits, and formularized incentives.

Both the reward and penalty sides of incentive formulas might be to buffer the differential burden by allowing everything over and under the average annual per capita contribution to earn a progressive scale credit or debit; accumulated and used to supplant the formula for annual allocation of services funds from above. For example, the savings credit or debit for larger or smaller than average per capita contribution to the treasury might be as shown in Table 16. ,

Table 16: Savings or Debit Accounts For Lower Spatial Levels
Based on Long Term Contributions to the Treasury

Contribution % above (below) average per capita*	Savings (Debit) as % of % above (below) average per capita
± 1 to 10 %	± 1%
± 11 to 20 %	± 2 %
± 21 to 30 %	± 3 %
and so forth, to	.
± 101 to unlimited %	± 10 %
	(± one year quota** limit before draw down)

*average per capita contributions to the treasury based on
annualized demographic and Treasury Department data

**current annual allocation of services funds from treasury

The worst/best case scenarios per the above table are that after 10 years of 100 % (or more) below/above average per capita contributions (1/2 and double), automatic draw downs would require a 10 % of quota minimum annual increase or decrease of the higher level annual allocation of revenues for local services until the limit is no longer exceeded.

Once turning a long term adverse trend around, the previously accumulated debit could be wiped out very quickly by an earned forgiveness; thereby allowing a rapid turnaround to immediately join the Savings side of the ledger, instead of being subjected to a protracted pay back period.

The particular characteristics of the incentive table or formula is not as important as the fact that a common sense, explicit attempt is being made to constructively influence societal learning. If the conscious intent is carried out long enough with sufficient follow through, something that works well will be found and maintained. Systematized methods, or science, intelligently and consciously applied over time, can do this for any synergram and do it better and faster than natural evolution alone.

The speed and relative certainty of science as compared to natural evolution, suggests the slogan phrase, "science revolution as opposed to natural evolution". One is a natural trial and error process that is dependent entirely on nature's dice throwing; followed by shotgunned, competitive, loser-be-damned, statistical selection with more dice throwing sprinkled throughout. The other is a combination of precise aiming and educated, self thrown dice, followed by carefully deterministic as well as statistical trials, with selection based on specific and humane verification criteria.

A formula for establishing annual quotas for allocation of national revenues for services at the local level, consistent with the above discussion, is offered in Table 17.

Table 17: Formula For Initial Quotas For Allocation
of Revenues To be Used For Local Level Services

discretionary income level; % above (below) national level average per capita =	% below (above) current year average quota allocated for services =
(24) Y , where $+15 > Y > -15$, and $Y_0 = 15$, $a = 1/\pi = .318$	$X = -a(Y)\text{Log}_{10} Y/Y_0 $ rounded to nearest .1 %
$\pm 16 \%$	$\pm .1 \%$
± 20	$\pm 2.5 \%$
± 40	$\pm 5.4 \%$
± 60	$\pm 11.5 \%$
± 80	$\pm 18.5 \%$
$\pm 100 \%$ (double or half)	$\pm 26.2 \%$
$\pm 300 \%$ (x4 or 1/4)	$\pm 124.1 \%$
$\pm 500 \%$ (x6 or 1/6)	$\pm 242.1 \%$

The above formula allows a dead-band of discretionary income levels of $\pm 15 \%$, and a progressivity-moderating, proportionality constant of, $a = .318$; values that leave reasonable incentives for the pursuit of happiness in terms of contribution and increased lifestyle choices.

The formula is, of course, subject to tuning by the experienced will of the people. Actual annual allocations are first determined using the approved formula based on discretionary income statistics, then adjusted per the previous table based on revenue contribution statistics.

The approach to formulated incentives based on economic considerations is primarily initiated by higher levels of government, such as currently represented by federal and state. At the local government level (county and city), and possibly for a few states, they may represent the final target of the incentives from above, and must primarily function as a follow through mechanism. The targeted level of government for such incentives from above, may also use monetary incentives such as employee bonuses or the lack thereof, and awards to private individuals and groups.

Other means of encouraging greater contribution by individuals and private groups within their home rule purview, is through licensing

and other regulatory means, and through property and sales tax incentives. The federal and state level incentives, of course, directly target individuals and private corporations also via income tax adjustments and credits.

Again, the particular methods of incentive government need only to make good common sense, and be capable of explicit operation and adjustment via the will of the people; until ways are discovered that work. For the most part, existing incentives, like all other elements of the rule of law, merely need to be simpler and more objective, with a built-in means of dynamic public access and calibration.

Government in the twenty first century would ideally offer a society of individuals a wide variety of home rule options. Yet that same government would provide effective and fair integration vertically, so that there is continual progress in maintaining maximum quality of life for everyone. With government science a common and well developed practice, it is conceivable that unanimity of rule could be achieved at the highest level of government while majority rule still prevails at the intermediate and local levels; or visa versa, if, at some particular time, that is what falls out as the net choices of the larger families of free human beings.

Objectivity of Government Deliberations: The terms subjective and objective, as defined here, are relative to the synergram level that the participant is operating on. Unless explicitly stated otherwise, we communicate feelings and thoughts based on personal experience and motivations, which, though objective in terms of our own "I", or objective overlay, is still subjective to everyone else. The same assumption applies when humans communicate with machines. Machines, for the moment at least, are assumed to communicate in the objective mode only, the synergram level of which should be explicit along with the data and instructions used as a basis.

When agreeing to communicate objectively, we sometimes forget that an explicit common basis is needed; that is, a larger synergram level within which we attempt to function as objective elements. That common level thus selected should generally be the highest or most comprehensive one that all parties are willing to agree to, since only then can all lower level synergrams, including those of potential conflict of interest, be addressed with equal objectivity.

For modern government deliberations, it appears increasingly important to create and maintain an explicit, common data base to be used as a point of departure, and as an integrity filter; for all discussion within the objective framework of the system. Put another way, if we know we need a common context for deliberation at a given synergram level, we ought to, by procedure, be creating and sustaining one every time we function at that level.

In national level problem solving bodies such as the loop 3 legislative and judicial, a government science approach entails the ready availability of an all-branch-acknowledged national data base and processing system which are explicit to the public, whether

consisting of human processing only or that of both humans and machines. Information input to such a data system is consistently identified as to the source synergram level and the particular individual and/or group represented. Outputs are also identified as to synergram level processing status and integrity.

Huge, but still rudimentary, equivalents of this common data base and processing system clearly exist. They are not, however, truly explicit to the public in a meaningful way, and certainly not visibly and interactively up to modern technology standards and expectations.

Up to date government debate and discussion of issues requires current, explicit indication of the system data elements which form the basis for deliberation. Also, speakers would be obligated by rule/procedure to try and give clear signals and maintain integrity as to which synergram level they are exercising at any given moment. Recording and instant recall of proceedings would be the rule.

Listeners/viewers having the slightest doubt about what objective level is operating, should have an unannounced, inalienable right to interrupt and ask, or simply tag the input as subjective. Where practicable, all members participating in a given deliberation should have immediate (real time) access to the public data system files involved, which files are identified before the meeting by the Chairperson or other designated leadership.

On the other hand, there may be nothing lost and much to be gained in an announced freewheeling debate which is open to making personal or subjective assertions in an effort to persuade. All that really matters is that the logic and/or other appeal succeeds; with a chosen one on one, and with the majority of a more general audience.

Speaking or writing with an authority gained by either, (1) citing specifics from long demonstrated (objectively established) capability and knowledge as explicitly contained in the public data system, or (2) by appointed/elected responsibility interpreting and synthesizing the content of that data system in a ringing manner, are very hard to beat, of course.

The freewheeling floor debates will always be needed when new problems are being addressed, for which there is very little public data system information, or when the public data system is itself (or its keepers) are subject to serious question. Obviously, for government science, freewheeling debate should be the exception rather than the rule.

Where science is involved, a public data base of experimental proof as agreed to by the majority of "objectively qualified" observers should be the final arbiter; however, logical consistency and demonstrated utility as determined by the model itself may be sufficient in the meantime. For government science, the body of objectively qualified observers includes the populace at large.

Where Justice is involved, we should have a judicial public data system which is uniquely separate and independent, yet still an integrated (read only) component of the public data base. Such a data base would be subject to change (re-write) only by the coordinated efforts of all branches of government at one or more hierarchy levels.

Where politics is involved, persuasion, in all of its forms, is what human communication is, and should be, all about. In modern times, the needed quickness, precision and variability of political persuasion, entails a healthy level of government science and a well defined public data system. With government science, political rhetoric, more than ever, will have the greatest clout when spoken from the viewpoint of the largest human synergram level that integrates the listening audience.

Daily politics, in an era of government science, can be clearly devoted to the tuning of government operations; i.e. to relative priorities of the moment in a given area and level of government. Politics then will, as it ought, be an expression of conscience.

The upshot of the existence and procedural use of a government science data base, is that our loop 3 deliberations would be more effectively enabled. That is, our best and highest levels of human judgement as exercised by our leaders, could concentrate on synthesis, or matters of overall policy, leaving most of the analysis to automatic machine processes and the supervision of those processes by loop 2 human operators. Only then can the critical long term planning and adaptation, the literal focusing of society's consciousness, be quick and precise enough to meet the challenges of the future.

Judicial Sensitivity Process Streamlining: Judicial Response in recent years has decreased greatly as society has insisted on improving Sensitivity even though the case load has gone up substantially. Special efforts to expedite matters and work off grossly unacceptable backlogs, seems to, more often than not, improve the quality of justice rather the opposite. This fact, the sheer bulk and complexity of codes and procedures, and the impact of lawsuit actions on insurance costs in recent times, are clear signals that the present system needs fundamental overhaul.

From a government science viewpoint, sensitivity or high quality should be possible under high case loads and complexity while maintaining adequate response. The key to that balance is the flexibility to increase (or decrease) Gain as the situation demands it. Because government never seems to decrease Gain once it has been increased, the public tends to believe that inefficiency is the main problem, and is unresponsive to calls for more revenue. The real culprit in the long run is inefficiency due to accumulated clutter, and the parasitic growth hidden and promoted thereby.

It is a tribute to the legal systems in the western democracies that, despite the increasing clutter, they have largely been able to

improve the sensitivity of justice, rather than sacrifice it to expediency. With a more scientific approach, expediency can not only be attained and maintained, but sensitivity may be raised to new, unprecedented levels.

The new, fully conscious goal of the rule of law might be to find that way of justice which would, in every civil instance, and in every criminal instance possible, make every one involved a winner again at the earliest possible point in time. It is fascinating to imagine what would happen if the present judicial system were to be so challenged. Yet, should not the first objective of a fully conscious, compassionate and intelligent correction mechanism be to restore all elements to synergistic activity as soon as possible?

The problem, again and of course, is that there remains the broad and biased variation of perception that nature and our rule of law contextually intends, and therefore protects.

Under trial and error evolution, strong incumbency has the best chance of survival in all spheres of activity. People who cannot or will not play according to the rules ought to lose, some are likely to insist. Where would be the chaotic freedom of free enterprise, or the room to be highly creative and productive so that humanity is pushed/pulled along to greater heights, if the maliciously destructive and the thieves are not restrained and punished, or otherwise removed?

The answer lies in a raised consciousness, which most of us may be beginning to feel. Our present system, the result of natural evolution, is no longer fully valid. Many more of us, if not all, should somehow be routinely winners in life, rather than routinely losers. We are capable of and must consciously find a better way, one that will let the bulk of society's rules concentrate on positive rather than negative feedback. That way, it is suggested here, is possible only through government science. It is the way of building a strongly held and lived general sentiment, a underlying body of unwritten law that supports all public policy the same.

Private citizens, as a members of the Jury, and as the ultimate selector of who will legislate, regulate, prosecute and judge, still have the power if they can be persuaded to use it synergistically. They should be persuaded also to be insistent on being provided with the basic tools that will allow them to exercise their power regularly and with full knowledge and understanding. The current, fragmented public data systems and their many paper and procedural forms of communicating, attempt to provide such tools. Very few citizens today feel that the mechanisms of their participation in government are especially designed or maintained so that they can freely and responsibly exercise their choices.

Though they recognize the need to prevent and limit abuse or neglect of citizen responsibilities, citizens would be much more cooperative and responsive if the communications interfaces were as user friendly

and as ubiquitous as the interactive computer screens they are now using every day in other areas.

Citizens are likely even to agree to use their own video screens and local telephone connections for such communications, the government initially providing only the integrated data base and common networking communications protocol for quick, secure and reliable file exchange. It is being done on a large scale in industry today and in combined industry/government enterprises. Why not in such vital areas of government as the judicial system.? Should not we begin soon to demand it of ourselves as responsible citizens, and as government employees?

Places where quick-payoff beginnings may be available include the trial jury and arbitration judicial processes. The civil and criminal codes, if not on magnetic medium or optical disk already at both the state and federal levels, is a relational data base whose time has come. There should be very few data processing budget priorities which are given greater urgency for the future. Public read-only access to such a relational data base library at all public libraries should be an immediate goal.

As soon as practicable, the traditional law summaries and case reference publications which are typically on file in the larger public law libraries should also be integrated with the relational data base of current legal code. Jury boxes, and juror deliberating and waiting rooms should be implemented with computer access terminals, where the data bases available are pertinent to the court business at hand and, for the individual case, the same as provided to all parties to that case while in and out of the courtroom. In the courtroom, the screens would be without keyboard and, perhaps, embedded in the walls such that everyone would see the same thing at the same time.

The formal data base inputs to a given case could begin with the requirements and formats as they exist now, except that they are encouraged to be input electronically, and if not, a fee is charged for their entry by the court staff. In the courtroom, evidence and testimony are introduced electronically from prior data base entry, or optically and audiodigitally entered in real time as annotated by the judge and serially identified and labeled by the court recorder.

In the jury deliberation room(s), screens with keyboards would allow individual review of all pertinent data base information and actual proceedings of the case in full audio/visual format. Jury polling would be by screen prompt and keyboard entry. A juror having a problem with evidence or testimony, or any kind of difficulty in coming to a decision, could be anonymously queried by a standard data base help program, which program would make additional information menu's available for selection and review, based on answers given to multiple choice questions. Alternate jurors would be kept "on line" so that they could be employed at a moments notice.

These suggestions merely amount to bringing our justice system, and our responsible citizens, up to date with existing technology and practice in business and in science; combining the same basic motivations for productivity and objective truth through intelligent, rapid learning. The paid keepers of such a justice system, would be the operator/synthesizer/designers of an intelligent data base system, who regularly summarize and report back to the people and the appropriate levels of legislative and regulatory data bases.

Temporal organization and tuning capabilities, so badly needed for the whole of government, would be electronically enabled by these suggestions. Loops 1, 2, and 3 response and closure would be effectively recorded and the data accumulated and analyzed for faster learning and adaptation: not based on subconscious evolutionary trial and error processes that require massive persistent failure before conscious recognition and tortuous correction; but based on conscious, revolutionary processes capable of quick, vernier scale tuning, and sensitive to the nuances of living that define civilized society.

Everyone; from the arresting officer to the clerk and judge of the court; to the district attorney's office; to the local media representatives; to the families, friends and witnesses of the parties; to the concerned regulative and legislative officials; all wanting to function better, would be more quickly and less expensively informed and enabled.

Attorneys of record, including pro per, for any given case would have 24 hour read only access to the latest pertinent data bases, and formal data entry submittal capability corresponding to all existing approved forms. Legal Appearance, in many instances, could be electronic (including notarized audio/visuals) upon request and at the Judge's discretion. Turnaround times for all legal research and proceedings would be greatly accelerated as the system learning gained momentum. Continuance would become increasingly difficult.

Certain extensive civil code structures, such as Discovery law, often used to legally delay and leverage the opposition toward settlement, would lose much of their utility and justification. The system would eventually develop an on-call array of "expert systems" attorneys, so that a defendant and witnesses might be deftly guided, pro per, to proper legal defense for the overwhelming majority of offenses that now fill and clog the courts with fee-earning attorneys.

Everyone would then have access to expert defense, regardless of economic and social background.

Plaintiffs and witnesses would be even more readily assisted by an interactive judicial public data base, in that they would be able to quickly compare their case with others on file and determine the likely outcome with quantitative, reliable odds.

Frivolous cases that now reach the courts, and many that reach expensive out of court settlements, would simply never be filed

because there would be much less citizen and insurance company uncertainty and fear to exploit. More citizens could become and remain winners because there would be fewer and fewer losers. There would also, of course, be fewer and fewer really-big winners.

The day may even come when appearance in a courtroom would be unnecessary except for the more serious crimes, which hopefully would be of much lesser volume. Most cases would be handled as an extension to a telephone call, where citizens teleconference electronically to settle disputes with the guidance of a government arbitrator. Appeals could be handled electronically also, by the assignment of arbitrators at higher government levels.

If this seems far fetched and impracticable, it is likely due to being so far behind where we could be, and not because of some impossible dream. And if by chance it becomes an impossible dream, our raised consciousness may insist that we try, anyway.

Verification of Effectiveness and Fairness: Scientific, or systematized methods of quality-of-life control based on the rule of law, clearly calls for quantified verification or proof that government is working effectively and fairly. This final conditional feedback loop closure of the temporal elements of government is the important new ingredient which, in effect, brings the rule of law to full consciousness by giving it an explicit, working conscience.

By providing a self-aware, behavior focusing mechanism for the new collective being, evolution then enters a new phase in a hopeful, revolutionary manner.

With the unconscious societal bonds between the individuals of a species having formed new collective beings of both human and machine content, the principal focus of evolution's trial and error process shifts to the competition between civilizations. The highest spatial level, or the new playing field for the "individuals" of this new species, is the cosmos. The practical everyday activities of modern societies then begin, on a limited scale, to catch up with the more modest and prophetic projections of science fiction.

In the meantime, societies surely must strive to vertically integrate to that level of focused self awareness whereby each is able to express itself as a single entity capable of learning from experience, and of propagating itself indefinitely into the future with increasing high quality of life.

The clear indicator of successful integration is the holistic emergence of a collective conscience that insists on routine verification and prediction of quality-of-life reality at all levels of being. In practical terms, this means that each rule or basis of government control must have a test criterion by which it's effectiveness can be measured.

Every rule of law must be consciously tested in application to determine whether the goal and intent are being satisfied, and to

determine the need for further adjustment, including possible cancelation or replacement. An "aging algorithm" could be made to uniformly apply across the board, whereby the lack of effective application for a prescribed period of time would result in recorded, public purging of the associated code. This approach applies to administrative as well as civil and criminal code. The administrative law that gives elected and appointed individuals the power of office, for example, must also have an explicit test criterion by which the effectiveness, and continued need, of the particular office is measured.

The test criteria data base elements, along with the corresponding administrative, civil and criminal code, form the core of a rule of law relational data base. Procedures for code administration include procedures for routinely measuring the effectiveness of code application.

Under the government science model herein, these measures of effectiveness are an integral part of the temporal, Loops 1, 2, and 3 response and closure mechanisms. Also, the legally recorded test criterion and associated measurement and analysis procedures are themselves part of an effectiveness evaluation, in that the ultimate proof of satisfactory operation are the standard feedback loop parameters described under "The Nature of Governmental Systems".

For any given code, testing is comprised of, not only the empirical evidence of it's near term effectiveness in satisfying the recorded intent, but it's ultimate statistical contribution to overall societal goals with respect to Gain, Sensitivity, Response, Performance, Cost and Utility. The mandatory documentation of regulatory government operations then consists almost entirely of Loops 1, 2 and 3 response and disposition reporting; such reporting being routinely entered into the public data system.

The regulatory operations also include, under administrative law, the human control of prescribed machine analyses, and distribution of results. Legislative, judicial and regulatory data bases include a large common core of data representing the public data system. This common core, and the regulatory-unique elements, are operated and maintained by the regulatory branch in accordance with administrative law. The legislative and judicial branches also have branch-unique data base elements which their personnel operate and maintain.

An immediate, significant benefit of the government science approach to legislation of code is the more comprehensive thought process required to cite test criterion. It should be the constant intent of a society desiring maximum practicable freedom, to minimize government control in achieving a given common goal. This intent to minimize government should apply especially to negative rule of law feedback. Positive feedback controls (services type functions) which tend to increase dependency in a way that discourages individual self achievement and sufficiency should, of course, also be minimized. By requiring a basic codification method that includes self-test criterion, the society is ensuring a higher degree of faithfulness to

effectiveness and fairness on the part of those assigned to government functions.

Existing and new administrative and civil code, in particular, ought to enjoy substantial simplification as a consequence of having to prove worth in application. In addition, the tendency toward routine use of code for the unintended purpose of self-perpetuating revenue collection would be greatly curtailed, if not eliminated all together.

Application of the law would tend to be more fair because of prior knowledge that each action is routinely and automatically subject to an analysis of enforcement intent as well as to the facts of occurrence. For example, automatic machine analyses would determine whether increases in the number of traffic tickets issued in a given area is justified by accident statistics, or other measurable increase or decrease in safety. Abuse of due process would certainly occur less often, and clutter, in general, would be self eliminating.

The longer term impact of codified verification of effectiveness and fairness would greatly improve Loop 3 and Loop 2; thereby reducing dependence on Loop 1 forceful arrest and containment actions. The risks of routine, "necessary force" actions against citizens would greatly diminish. Both the motivations and opportunities for abuse of police power at the street level would be eliminated for the simple reason that it would constitute explicit malfeasance by a public official. The potential for a public service employee to have a sudden loss of elementary humanity toward another might well become a dependable screening function of the government hiring and training system data base.

The existence and long term use of the self-verifying approach to the rule of law would finally make it possible and fully acceptable to eventually hold each adult citizen, and their private enterprises, responsible for their own citizenship.

Each adult citizen's overall participation or non-participation would become a matter of record; not in privacy invasive terms, but in contribution upshot, available for constructive reference at the option of the individual and corporate entity. This is, of course, already being done in terms of Internal Revenue Service policies with regard to operating losses, earned income, and other lower income and hardship credits, and on the other side of the ledger, in terms of investment and other types of contribution deductions or credits.

The principal new areas of private sector participation would occur in terms of scheduled data system access for purposes of Loops 1, 2 and 3 routine sensing and tuning, and for quick plebiscites on specific issues before government. As government improves and is subjected to greater explicitness and timeliness in its conduct, so then must the private citizen and their enterprises submit to much the same. Otherwise, very few capable individuals will involve themselves in government.

The commitment to explicitness in a social contract should work in all directions equally.

The public data system should be directed to faithfully and quickly providing information essential to synergistic decision making; on the part of both the private sector and the government. The responsible citizen and corporate entity then voluntarily and otherwise interact such as to provide timely and reliable data to the system at regular intervals. In this area of participation also, government should provide incentives that re-enforce mutually desired behavior. Any constructive aspects of lobbying, which remain effective under government science, are likely best incorporated in this area of private sector participation.

The public data system, as guarded by the public and their chosen leadership, must eventually be the guarantor not only of specific rule effectiveness, but of rule of law contextual fairness. Automatic analyses are provided that integrate data, both spatially and temporally, to detect and even predict any unintended trends of unequal holistic effect; i.e., any unequal effects of the aggregate of higher level government controls as felt at the local level over an extended period of time. These same analyses are also accomplished at the local level to ensure long term fairness of the aggregate of local controls on individuals and private sector groups. These routine analyses must also be capable of distinguishing and measuring both the physical and mental, or spiritual, quality of life; for individuals and their private enterprises.

Human consciousness and conscience is capable of ultimately making life fair, or something close to it. But only if we are willing to fully use collective intelligence potentials to remove the last drudgery of assuring physical quality of survival for everyone. Only then can the needed focus and priority be placed on attaining the highest common spiritual quality of life.

The scientifically trained, systems level problem solving community of Earth is likely more than adequate to the technical tasks suggested herein. The more affluent western nations, and especially the USA, have the greatest potential for a quick start that can lead the way. It is most likely that, unless the USA is able and willing to lead the way soon, such a new approach to the rule of law may never benefit the present generations on Earth.

Whatever our ultimate fate as a consequence of commitment to the rule of law, this essay would have it be said that the consciousness of humanity turned the corner in the twentieth century A.D.. One can only hope that it will also be said someday that *the conscience* of humanity turned the corner in the twenty first century.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120701

FROM: MATH, Paul: U.S. GENERAL ACCOUNTING OFFICE

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 03/07/91

SUBJECT: ADVISING OSTP THAT GAO IS BEGINNING A SURVEY,
"FEDERAL PROCESSES FOR COLLECTING & DISSEMINATING
FOREIGN TECHNOLOGY INFO TO U.S. POLICY MAKERS AND
INDUSTRY

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Dr. Phillips
Thomas Ratchford
Michelle Van Cleave

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 03/11/91

FILE: INTERNATIONAL*^{INDUSTRIAL}TECHNOLOGY



United States
General Accounting Office
Washington, D.C. 20548

RECEIVED

National Security and
International Affairs Division

01 MAR 11 AM 11:43

March 7, 1991

OFFICE OF THE
DIRECTOR

Dr. D. Allan Bromley, Director
Office of Science and Technology Policy
Executive Office of the
President
Washington, D.C. 20506

Dear Dr. Bromley:

This is to advise you that we are beginning a survey entitled "Federal Processes for Collecting and Disseminating Foreign Technology Information to U.S. Policy Makers and Industry". This assignment is being initiated at the request of the Chairman of the Subcommittee on Defense Industry and Technology, Senate Armed Services Committee. The GAO assignment code for this assignment is 396040.

The objectives of this assignment are to evaluate the federal government's processes for collecting and disseminating critical -- especially dual-use -- foreign technology information to U.S. policy makers and industry. Specifically, this includes identifying the source and nature of foreign technology information used to develop the Department of Defense Critical Technologies List, the National Critical Technologies Panel's List, and the Department of Commerce's Emerging Technologies List. It also includes obtaining the views of the federal officials and industry representatives that played a major role in developing these lists regarding the usefulness of this foreign technology information and opportunities to improve the process.

This assignment, which will begin in early March 1991, will include interviews with members of the National Critical Technologies Panel. Dr. William Phillips and your office will be contacted as required. If you have any questions concerning this assignment, please call Rosa Johnson at (202) 275-4687.

Sincerely Yours,

A handwritten signature in dark ink, appearing to read "Paul Math", with a stylized flourish at the end.

Paul Math, Director
Research, Development, Acquisition,
and Procurement Issues

cc: Dr. William D. Phillips, Associate Director for
Industrial Technologies

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120548

FROM: DRESNER, Marcia R.: CHEMTECH

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/22/91

SUBJECT: QUESTIONS CONCERNING THE REQUEST TO PUBLISH A
SHORTENED VERSION OF "US TECHNOLOGY POLICY."

ASSIGNED TO: Dr. Phillips

ACTION REQUIRED: AS NECESSARY

SENDER'S DUE DATE:

OSTP DUE DATE:

03/19/91

DATE COMPLETED:

---3/5/91---

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: Please note that this has been reassigned to Dr. Phillips.

DATE RECEIVED: 02/27/91

FILE: Industrial
TECHNOLOGY

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

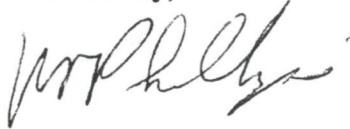
March 5, 1991

Dear Ms. Dresner:

We would be happy to have you publish and comment on any version of the U.S. Technology Policy that you and your colleagues at CHEMTECH deem appropriate. The material is not copyrighted. We do not need to see an edited version of the Policy before you publish it, but we feel that you should clearly indicate that you have so edited or abstracted the version that we released. You may reproduce the logo and we certainly would not insist on a photograph.

Please let me know if I can be of further assistance.

Sincerely,

A handwritten signature in dark ink, appearing to read 'W.D. Phillips', written in a cursive style.

William D. Phillips
Associate Director for Industrial Technology

Ms. Marcia R. Dresner
Managing Editor
CHEMTECH
1155 Sixteenth Street, N.W.
Washington, D.C. 20036



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Marcia R. Dresner, *Managing Editor*

RECEIVED
FEB 27 9:47
OFFICE OF THE
DIRECTOR
February 22, 1991

Dr. D. Allan Bromley
Executive Office of The President
Office of Science and Technology Policy
Washington, D.C. 20506

Dear Dr. Bromley:

CHEMTECH would like to publish a shortened version of the U.S. Technology Policy which was issued by your office on September 26, 1990. It would be published in our column called "View from the Top."

There are a number of questions that would need to be answered before we can proceed. What is the copyright status of the document? Would you want to see our edited version before we actually publish? Would you want your photograph to appear with it, or could we use the wonderful logo that appeared on the front cover of the report?

CHEMTECH is the multi-disciplinary magazine of the American Chemical Society and reaches an audience of about 100,000. The magazine publishes articles designed to point the way to new technologies, techniques and ideas for the industrial chemist at the laboratory, bench and management levels. The enclosed February 1990 issue contains a "view" taken from a John Sununu speech; I've also enclosed the December 1990 issue so you can see from the index the range of material our readers are exposed to.

Please let me know how to proceed. We really would like to bring this policy to the attention of our readers.

Sincerely,

Marcia R. Dresner
Managing Editor

Enc.

"CORRESPONDENCE TRACKING"

TYPE: Action Item

DOCUMENT NUMBER: 9120480

FROM: WOODS, Joyce: US2U

TO: Bromley

DATE OF
CORRESPONDENCE: 02/21/91

SUBJECT: Request to call Sam Greenberg, President of US2U and
Details on the US2U Technology Exchange

ASSIGNED TO: D. Allan Bromley

ACTION REQUIRED: As appropriate

SENDER'S DUE DATE: OSTP DUE DATE: 02/22/91

DATE COMPLETED: 02/27/91

COPIES TO: William D. Phillips

WHITE HOUSE TRACKING #: CONTACT PERSON:

REMARKS: Dr. Phillips was invited to speak at US2U Conference in Santa Clara, CA on 3/20; however, we were informed by J. Wyckoff on 2/27 that the conference was cancelled.

DATE RECEIVED: 02/21/91

INDUSTRIAL
FILE: TECHNOLOGY ~~TRANSFER~~



21 February 1991

Dr. D. Allan Bromley
Executive Office of the President
Washington, DC 20500

RECEIVED

OFFICE OF THE
DIRECTOR

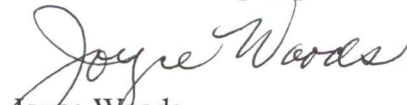
Dear Dr. Bromley:

This packet gives details on the US2U Technology Exchange, a private sector effort to stimulate technology transfer from the federal labs. Business so far is slow --

Sam Greenberg, the president of US2U, has an interview with the *Wall Street Journal* tomorrow. He is an admirer of yours, and may appreciate a call if there is any point of view that is more current and more valuable than others that might be expressed on this occasion. His telephone number is: (718) 279-2630.

Sam knows I am forwarding the media kit to you, but not about this cover letter. He may be surprised if you call.

Yours for a more prosperous US,


Joyce Woods
Vice President

Enclosures:
US2U brochure
US2U media kit

New York:

42-25 243rd Street
Douglaston, NY 11363
718-279-2630
718-225-8114 (Fax)

California:

1350 Magnolia Avenue
San Jose, CA 95126
408-286-7956
408-370-1212 (Fax)

Washington, DC:

5113 Heritage Lane
Alexandria, VA 22311
703-998-5710
703-998-8222 (Fax)

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120526

FROM: NELSON, Mark: SEMATECH

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/21/91

SUBJECT: LETTER REGARDING A VISIT TO SEMATECH IN AUSTIN AND
COPIES OF AND TESTIMONY ON RECOMMENDED CHANGES IN US
ANTITRUST LAWS AS RELATED TO JOINT VENTURES.

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE: OSTP DUE DATE:

DATE COMPLETED: -----

COPIES TO: Dr. Phillips
D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/26/91

FILE: INDUSTRIAL
TECHNOLOGY

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01a. Letter	To: Allan Bromley From: Mark Nelson Re: Visit to Sematech [P.L. 100-180, Sec 276(a)] (1 pp.)	2/21/91	(b)(3)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [7 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-007
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
(b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
(b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
(b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01b. Testimony	Testimony by Robert Noyce, CEO of Sematech, before the US Senate Committee on the Judiciary Subcommittee on Technology and the Law [P.L. 100-180, Sec 276(a)] (10 pp.)	3/29/90	(b)(3)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [7 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-007
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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(b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
(b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
(b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
(b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
(b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
(b)(9) Release would disclose geological or geophysical information

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01c. Comments	Comments Submitted for the Record in Response to Hearings Conducted by the US Senate Committee on the Judiciary Subcommittee on Technology and the Law [P.L. 100-180, Sec 276(a)] (5 pp.)	3/29/89	(b)(3)	

Collection:

Record Group: Bush Presidential Records
Office: Science and Technology Policy, Office of (OSTP)
Series: Bromley, D. Allan, Files
Subseries: General Science Files
WHORM Cat.:
File Location: Industrial: General [7 of 7] [1991]

Date Closed:	3/10/2010	OA/ID Number:	62034-007
FOIA/SYS Case #:	2005-0336-F	Appeal Case #:	
Re-review Case #:		Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
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 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120407

FROM: PHILLIPS, DON I. (GOVERNMENT-UNIVERSITY-INDUSTRY RESEARCH)

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/13/91

SUBJECT: REQUEST FOR COMMENTS EITHER BEFORE OR DURING THE
ROUNDTABLE SYMPOSIUM, FUTURE NATIONAL RESEARCH
POLICIES WITHIN THE INDUSTRIALIZED NATIONS.

ASSIGNED TO: D. Allan Bromley

*Mr
IS DAB attending
this?
No*

ACTION REQUIRED: ONLY AS NECESSARY

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED: -----

COPIES TO:

Dr. Phillips

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

*2/21/91 Regretted to Wanda Landau,
m m*

Enclosure on file

DATE RECEIVED: 02/14/91

FILE: INDUSTRY

9120407

GOVERNMENT-UNIVERSITY-INDUSTRY
RESEARCH ROUNDTABLE

NATIONAL ACADEMY OF SCIENCES
NATIONAL ACADEMY OF ENGINEERING
INSTITUTE OF MEDICINE
2101 Constitution Ave., NW Washington, DC 20418

91 FEB 14 P 3: 20

February 13, 1991 (202) 334-3486

OFFICE OF THE
DIRECTOR

MEMORANDUM

TO: Members and Associates, Roundtable Council

FROM: Don I. Phillips *Don*

SUBJECT: Agenda and Background Materials for the February 27-28 Council Meeting

Enclosed are the agenda and background materials for the February 27-28 meeting of the Roundtable Council. The meeting will be held in the Lecture Room of the main National Academy of Sciences Building, 2101 Constitution Avenue. It will begin with continental breakfast at 8:30 a.m. on Wednesday, February 27, include dinner on Wednesday evening, and adjourn by 11:15 a.m. on Thursday, February 28.

As you know, the Roundtable symposium, **Future National Research Policies Within the Industrialized Nations**, is the day before the Council meeting and includes dinner for the Council members and symposium speakers. Please call me if you have any questions about the symposium or dinner.

The highlights of the Council meeting are:

- o Discussion and lunch with the symposium speakers. See TAB D for the questions to guide the discussion and the list of speakers.
- o A major session on coordination of science and mathematics education reform efforts; the guests will join the Council for dinner. See TAB E for the detailed agenda and list of speakers and guests.
- o Consideration of new Roundtable activities in two areas: 1) environmental aspects of research activities and 2) issues related to industry and industry-university relationships.

Also, TAB H includes a draft discussion paper on **Strategic Planning for the Academic Research Enterprise** that is the result of conversations among Bill Danforth, Al Barber, and me. We are unable to include this on the agenda, but we very much want your comments before or during the meeting.

Enclosure

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120423

FROM: HILL, CHRISTOPHER T.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/12/91

SUBJECT: HAND-OUTS DISTRIBUTED AT THE JANUARY 11
MANUFACTURING FORUM MEETING

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Dr. Phillips

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/15/91

FILE: INDUSTRIAL TECHNOLOGY

9120423

THE MANUFACTURING FORUM

National Academy of Engineering National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

RECEIVED
FEB 15 10:33

OFFICE OF THE
DIRECTOR

Telephone: 202/334-1579
FAX: 202/334-2290
BITNET: CHILL@NAS.BITNET

February 12, 1991

MEMORANDUM

To: Donald Beall
Philip Benton
Michael Boskin
Allan Bromley ✓
Rod DeArment
Jerry Junkins
Henson Moore
Thomas Murrin
John Reed
Morris Tanenbaum
Linn Williams

From: Christopher T. Hill CTH/pj

Subject: Hand-Outs Distributed at the January 11 meeting

As promised in my memo of February 11, here are copies of the hand-outs distributed on January 11 at the third meeting of the Forum. Enclosed are

1. Daniel Roos' viewgraphs and detailed notes regarding the International Motor Vehicle Program.
2. The Council on Competitiveness' letter to President Bush.
3. Erich Bloch's viewgraphs.
4. Excerpts from the FY91 Defense Appropriations Act and other DOD material.

In addition, we are enclosing a Forum Status Report dated January 1991 that you will find of interest.

cc (w/enc.): J. Robson
R. M. White (DoC)

"CORRESPONDENCE TRACKING"

TYPE: ACTION

DOCUMENT NUMBER: 9120404

FROM: ROSENSTEIN, ALLEN B.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/12/91

SUBJECT: COMMENTARY ON U.S. TECHNOLOGY POLICY IN THE CONTEXT
OF THE LARGER NATIONAL POLICY QUESTIONS AND A
REQUEST TO FURTHER DISCUSS THESE MATTERS.

ASSIGNED TO: Dr. Phillips

ACTION REQUIRED: DIRECT RESPONSE

SENDER'S DUE DATE:

OSTP DUE DATE:

03/06/91

DATE COMPLETED: Met with Dr. Rosenstein on 2/25/91.

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

DATE RECEIVED: 02/14/91

FILE: INDUSTRIAL
TECHNOLOGY ~~POLICY~~

February 13, 1991



RECEIVED
Pioneer
Magnetics
FEB 14 AM 11:32

Dr. D. Allan Bromley, Director
Office of Science and Technology Policy
Executive Office of the President
Washington, DC 20506

OFFICE OF THE
DIRECTOR

Dear Dr. Bromley:

Dr. Kent Hughes, President of the Council on Competitiveness, has distributed the excellent U.S. Technology Policy statement of September 26, 1990, with a request for comments by Council members.

There is probably no more important question facing the United States today than the largely unrecognized issue of coherent national policy. National Policy, in turn, is inseparable from technology policy.

The enclosed material offers a somewhat detailed response to the Administration's Technology Policy document in the context of the larger national policy questions.

As a Professor of Engineering and Board Chairman of an electronics company, I have been writing about the national policy problem for over twenty years. From these papers, seven bills have been introduced before the Congress. One of the bills is included in the referenced material.

We are in Washington at regular intervals. It would be a privilege to discuss these matters further with your office.

Sincerely,

Allen B. Rosenstein
Chairman of the Board
Pioneer Magnetics, Inc.

Professor of Engineering
University of California
at Los Angeles

ABR:kj

cc: Senator Robert C. Byrd
Senator Ernest Hollings
Congressman Jamie L. Whitten
Congressman George E. Brown, Jr.
Dr. Kent H. Hughes, Council on Competitiveness
Mr. Richard Iverson, American Electronics Association

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120387

FROM: HILL, CHRISTOPHER T.

① Marian
② DAB

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE: 02/11/91

SUBJECT: FORUM PLANS AND FOLLOW-UP TO JANUARY 11, MEETING

ASSIGNED TO:

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED:

COPIES TO: D. Allan Bromley
Dr. Phillips

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS:

5/6/91 - Regretted to Penny Gibbs!
mn

DATE RECEIVED: 02/13/91

FILE: TECHNOLOGY-MANUFACTURING

9120387

THE MANUFACTURING FORUM
National Academy of Engineering National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

RECEIVED
JAN 12 1991
OFFICE OF THE
DIRECTOR

Telephone: 202/334-1579
FAX: 202/334-2290
BITNET: CHILL@NAS.BITNET

February 11, 1991

MEMORANDUM

TO: Members of the Manufacturing Forum

FROM: Christopher T. Hill, Executive Director *CTH*

RE: Forum Plans and Follow-up to January 11, Meeting

Next Meeting Date

The next meeting of the Manufacturing Forum is scheduled for June 5, 1991, in Washington, D.C., at the National Academy of Sciences.

You may recall that we asked you to keep March 6 available as a date for a possible meeting. However, Ruben Mettler and I have decided not to use that date for a full membership meeting. Instead, we anticipate preparing for the full meeting in June by holding a series of smaller working meetings on issues and questions raised in our July, September, and January meetings.

Summary of the January 11, 1991, Meeting

Attached to this memorandum is the summary of the January 11, 1991, meeting of the Forum for your use.

The summary refers to a number of documents that were distributed to members at the meeting. For those who were not in attendance, copies of those documents will be sent to you under separate cover. If you did not obtain these documents at the meeting and would like copies, please let us know.

Additional Informational Items

Also under separate cover, all members of the Forum will be sent copies of several recent documents that may be of interest to you.

Continuing and Future Forum Activities

The summary of the January 11 meeting refers to several on-going and future activities of the Forum. Their status can be briefly summarized as follows:

1. The paper by Erich Bloch on U.S. Technology Strategy has undergone final review and revision and is expected to go to the National Academy Press for printing and distribution in the very near future.

2. The paper by George Heaton on the Japanese Intelligent Manufacturing Systems proposal has been completed in first draft. Rube and I will be asking certain members of the Forum who have expressed an interest in this subject to review the next draft carefully. We may also ask you to name one of your colleagues to review the paper on your behalf. In view of the schedule of the next meeting and the pace of negotiations on IMS, it may be desirable for us to move this paper toward completion as soon as possible. It will be one of the topics of discussion at the June meeting.

3. The paper by Mary Ellen Mogie that summarizes current reports on technology policy and on critical technologies remains in preparation. It cannot be completed until the release of the forthcoming reports on these subjects by the Office of Science and Technology Policy, the Council on Competitiveness, and other groups.

4. We will be organizing shortly a task group of the Manufacturing Forum to discuss ways in which the tax code and/or other regulations might be changed to encourage greater investments in research and development related to manufacturing processes. Specifically, we have encountered considerable interest in the proposition that the R&D tax credit as currently structured does not adequately incorporate expenditure for R&D on manufacturing processes. Others suggest that incentives focused on investments in manufacturing technology, such as investment tax credits or accelerated depreciation, should also be considered. We will be asking various members of the Forum to work on this task group and/or to suggest colleagues who might serve.

5. We have begun discussions with various parties concerning two other high-priority projects, in which we will be asking various members or their designees to participate in task groups. One of these is encouraging the adoption of best practices in manufacturing, and the other is advanced education in manufacturing engineering and manufacturing management.

With regard to best practices, there has been a great deal of interest in the "lean production" model and empirical work done by Professor Roos and colleagues at MIT and discussed at our January 11 meeting. Preliminary discussions with Professor Roos suggest that we might perform a distinct service to the manufacturing community at large by hosting under Manufacturing Forum auspices one or more major meetings at which the ideas underlying lean production would be the focus of discussion by panels of experts and practitioners.

With regard to manufacturing education, preliminary discussions with various federal agency officials and other interested parties, including the Association of American Universities and key congressional staff members, suggest that it might be constructive for the Forum to structure discussions among academic leaders, industrial leaders and personnel managers, and federal funding agencies to find ways to better educate and properly employ persons educated in the new fundamentals of manufacturing.

We will keep you informed of progress in these areas and, of course, welcome your suggestions and contributions at any time.

MANUFACTURING FORUM

SUMMARY OF THE THIRD MEETING¹

January 11, 1991
Washington, D.C.

DRAFT FOR REVIEW
February 5, 1991

Overview

Fifteen members attended the third meeting of the Manufacturing Forum. Also in attendance were invited guests, including representatives of the Departments of Defense and Commerce and the National Science Foundation, faculty and staff of MIT, and consultants and staff of the Manufacturing Forum and the National Research Council.

The meeting began with presentations by several Forum members of updates of ongoing activities of interest to the members. It then turned to a presentation of his paper by Forum member Erich Bloch, followed by a spirited discussion of the paper and its implications.

The Forum members were given two briefings. The first, on the activities of the Department of Defense in the areas of technology and manufacturing, was offered by Richard Donnelly from the Office of the Under Secretary of Defense for Acquisition and by Victor Reis, Director of DARPA.

The second briefing was offered by Daniel Roos and James Womack of MIT, who discussed the analysis, findings, and implications of their studies of "lean production" in the automotive industry, as reported in their new book, The Machine That Changed the World.

The meeting closed with a discussion of possible next steps for Forum activities, including brief updates on the status of the background papers being prepared for the Forum by consultants George Heaton and Mary Ellen Mogee.

The remainder of this summary is organized around the broad themes of the discussion at the meeting. The presentations by Bloch and by Roos and Womack are summarized only briefly, since the Bloch paper was distributed to

¹Prepared by Christopher T. Hill, Executive Director, Manufacturing Forum. Views summarized herein are those of individual members of the Forum or of its guests, not of the Forum as a whole.

members in advance and since Roos presented a detailed set of viewgraphs to those in attendance.² More detail is presented here on the DOD briefings since handouts were not made available.³

Opening Remarks by Forum Members

Ruben Mettler called the attention of the members to a letter to the President of the United States from the leadership of the Council on Competitiveness urging him to include in his State of the Union address in January that he is "...establishing it as a national priority to...regain leadership where we have faltered and sustain it where we continue to lead in the critical technologies driving economic performance and productivity."⁴

Mettler also noted that two members of the Forum have left their government positions since the Forum last met. Thomas Murrin, formerly Deputy Secretary of Commerce and now Dean of the School of Business and Administration at Duquesne University, will remain as a Forum member from the academic sector. John Betti has resigned from his position as Under Secretary of Defense for Acquisition and will not continue as a Forum member. New members will be sought from both Commerce and Defense as soon as their successors are named and confirmed, as will a replacement for Erich Bloch at NSF when his successor is confirmed.

James Duderstadt brought the group up to date on recent developments in his and others' attempts to increase federal support for graduate traineeships for engineers and scientists. Through the National Science Board, a recommendation has been made for the establishment of 1,000 such traineeships in FY92, rising to 5,000 over 5 years. In addition, a committee of the Federal Coordinating Council on Science, Engineering and Technology, in conjunction with OSTP, has recommended a total of \$150 million in graduate traineeships in other agencies for FY92. However, these recommendations have not yet been accepted by OMB, so the proponents anticipate further contacts with OMB and appeals to Congress during the appropriations process. The administration may oppose these funds due to its current emphasis on pre-college education. Such financial aid for US citizens studying science and engineering was supported in subsequent Forum discussion, although caution was urged in approaching Congress directly, unless prepared to discuss what other activities should be cut to fund them.

²Roos' viewgraphs have been distributed to members not in attendance under separate cover. Copies of the book by Womack, Jones and Roos were made available to members in attendance.

³DOD staff indicated that copies of their briefing charts would be made available to the Forum in the future, but they have not yet arrived. Elements of their materials have been sent to all members under separate cover.

⁴A copy of the letter has been sent to all members not in attendance under separate cover. As of January 25, the Council had not had a formal response to its letter.

Dale Compton discussed the status of the NAE's project on "Foundations of Manufacturing Systems," which he is chairing. Eighteen papers are in preparation on various aspects of best practice in manufacturing systems and management. The report should go to the publisher in early summer, with a final symposium in late June.

William Phillips, Associate Director of the Office of Science and Technology Policy for Industrial Technology, brought the group up to date on several aspects of the administration's technology policy. First, reactions to the administration's September 1990 statement on "U.S. Technology Policy"⁵ have ranged widely -- from disappointment to the view that the report is an important watershed. Further work on this policy is expected to be carried out as part of OSTP's on-going agenda and in response to industrial initiatives. Phillips also commented on the status of the OSTP National Critical Technologies study, mandated under the FY90 Defense Appropriations Act. This study is expected to be sent to the President from OSTP around February 1 and to Congress by March 1. In 4 to 6 pages each it will address 26 technologies, drawn to reflect a number of national needs, including those identified in earlier reports by DOD and Commerce. It was noted that this effort has two conflicting objectives: to make something happen with respect to a high-priority short list of critical technologies, and to satisfy the various agencies that want their favorites to be on the list.

Phillips also discussed the status of the proposed National Critical Technologies Institute, mandated under the FY91 Defense Appropriation Act. OSTP expects to organize it as an FFRDC⁶. It would have a Board of Advisors chaired by the Director of OSTP with agency heads and private sector members. It is hoped to have it selected by June 1. OSTP may work with an existing FFRDC or associate with a different organization. Funding for the first year is in hand from DOD (\$5 million less the mandatory 1.25% for the Small Business Innovation Research Program), but future funding is very uncertain.

Robert White⁷ summarized a number of ongoing studies, projects, and boards at the National Academies that are of interest to manufacturing and competitiveness. These include a new Board on Science, Technology and Economic Policy to be chaired by Michael Spence of Stanford; the ongoing Study of the Government Role in Civilian Technology, chaired by Harold Brown; a new

⁵Copies were sent to all Forum members late in 1990.

⁶Federally Funded Research and Development Center. Typical FFRDCs include the Institute for Defense Analysis, the RAND Corporation, and the Lincoln Laboratories at MIT.

⁷Two Robert M. Whites were in attendance: one is the President of the NAE and a Forum member, and the other is the Under Secretary of Commerce for Technology, standing in for the Department of Commerce which does not have an active Forum member at this time due to the movement of Thomas Murrin to Duquesne University. Unless otherwise noted, reference in this summary to Robert White is to the NAE president.

NAE study of Technology Policy Options in the Global Economy, co-chaired by Harvey Brooks and John Foster; and the ongoing Committee for the Study of Defense Manufacturing Strategy being carried out by the Manufacturing Studies Board of the National Research Council. He also noted his view that there is movement toward a technology policy within the administration and Congress and that the Forum is in a key position on these matters.

Toward a U.S. Technology Strategy: Enhancing Manufacturing Competitiveness.
Presentation by Erich Bloch.⁸

The essence of Bloch's paper is his view that current science and technology policies are inadequate to address the realities of a new world featuring many new, strong economic competitors in which the United States has strong advantages but also strong disadvantages. He argues that the administration's new statement of U.S. Technology Policy is a good beginning but that more must be done in such areas as support of generic technologies, reversal of the loss of the U.S. technology base, accelerating the commercialization of new technologies in the U.S., and strengthening collaboration among industry, government and universities. He offers a number of specific proposals to achieve these goals in both his paper and his briefing charts.

Bloch argues that actions need to be focused in a few key areas, beginning with a strong expression of leadership by the President and actions to rebalance the federal R&D budget toward a 50/50 civilian-defense split. This will require setting priorities among projects, he says.

Bloch recommends that the R&D tax credit be made permanent and be redesigned to incorporate expenses on R&D on manufacturing processes. A considerable discussion of the entire matter of fiscal and financial incentives for both R&D and capital investment in manufacturing followed. One member noted that a firm that is driving down all of its production costs, including making R&D more efficient and thus reducing R&D expenditures, cannot claim the R&D credit. Some suggested this is an argument in favor of making the credit apply to all R&D expenditures, not just to incremental ones over a base. A number of other problems with the R&D tax credit were discussed, including its temporary nature, the need for clarification to the Internal Revenue Service of the intended applications of the credit, and the possibility of creative redefinition of activities as R&D in order to claim the credit.

Discussion of the R&D credit led to consideration of other tax incentives for manufacturing, including accelerated depreciation, investment tax credits, and financing of lease transactions. For smaller firms that do

⁸A draft of his paper was included in each member's agenda book. Bloch also made copies of his briefing transparencies available, and these have been sent to all members not in attendance under separate cover. After final review and revisions, his paper will be distributed by the Forum under his personal authorship.

little or no R&D, as well as those for which process improvements are important, incentives for investment in new plant and equipment may be more important than R&D incentives. The current budgetary imperative for revenue neutrality was noted, along with the possibility of a new tax package incorporating a mix of investment incentives with higher base rates.

There was also considerable discussion around Bloch's recommendations for greater use of the federal laboratories to work on generic technology questions with industry, as well as for stronger inter-sectoral cooperation in R&D and technology transfer. Difficulties in making effective use of state-based technology centers were mentioned, as was the relatively high usefulness of state-based training efforts. Such activities in Germany were singled out for favorable mention. There was a lot of favorable mention of efforts to upgrade the performance of small firms and suppliers. Doubts were expressed over the degree to which federal laboratories could be converted to work with industry, although successful examples such as those at Argonne and Los Alamos National Laboratories were mentioned. It was noted that there are over 700 federal laboratories, but that their first allegiance has to be to achieving their missions, which are generally not to help industry but to accomplish other public purposes. Bloch suggests modifying some of those missions, and pointed to the old National Advisory Commission on Aeronautics, now in NASA, as a successful model of industry-government cooperation in a government facility.

There was some discussion at this point of the Forum taking the lead, in cooperation with OSTP or another federal agency, in creating a workable scheme to make the federal laboratories effectively useful to industry. Later in the meeting, this subject arose again, with special emphasis on use of the laboratories to assist in transfer of technology and in direct utilization of their resources. Several members expressed strong interest in a Forum project in this area.

Technology, Manufacturing, and National Security⁹

Richard Donnelly discussed the role of DOD in manufacturing through its procurement contracting responsibilities and through direct government operations. He pointed out that DOD has over 40,000 contractors, that it takes over 7,000 contract "actions" every working hour, and that with its acquisition budget of \$140 billion annually, it is a major industrial customer, especially in aeronautics and electronics.

⁹This briefing was offered by Richard Donnelly, Principal Director for Manufacturing in the Office of the Secretary of Defense, and by Victor Reis, Director of the Defense Advanced Research Projects Agency, DARPA. They were accompanied by Gary Denman, Deputy Director of DARPA, and Michael Kelly, Director of Manufacturing at DARPA. Briefing charts were not available for photocopying and distribution at the time of the meeting, and it is hoped that they will be available soon.

He also said, therefore, that there is really only a single national industrial base, and that the concept of a separate defense industrial base is incorrect.

DOD can use a number of policy tools to aid in manufacturing modernization, including procurement policy itself (e.g., buying for quality rather than for lowest bid price), R&D contracts for better manufacturing technology (see DARPA briefing below), the Manufacturing Technology (ManTech) Program, IMIP (Industrial Modernization Incentives Program), and Title III of the Defense Production Act.¹⁰ However, Donnelly pointed out that all of these tools work at the margin of an industrial base that largely serves civilian needs.

Donnelly displayed some data on trends in funding for the ManTech program which show that after a decade in which ManTech funding has varied up and down between about \$150 and \$200 million per year, Congress appropriated \$315 million for FY91, or more than double the administration's request. He expressed his view that Congress has been correct in its assessment that the DOD manufacturing technology effort has been carried out on an ad hoc basis, and noted that the DOD has been directed to carry out a National Defense Manufacturing Technology Plan by the FY91 Defense Appropriations Act.¹¹ A considerable portion of the increased appropriation can only be spent pursuant to the Plan. The DOD has begun this activity by establishing an interagency task force in the week before the Forum meeting.

Donnelly was asked whether IR&D funds could be used to pay for R&D on manufacturing processes. He answered that they can, but that less than 10% of IR&D funds are actually spent this way. He also noted that industry does not necessarily want this situation to change, in part because it can apparently claim more favorable tax treatment for such expenditures. It was pointed out that it is contrary to the practices of DOD auditors and perhaps even to law to use IR&D funds to improve the processes used to accomplish an existing procurement contract. It was further noted that this limitation may be in conflict with the central thrust in modern world-class manufacturing practice -- to seek both continuous incremental improvements in processes and to use total quality management approaches to production.

Victor Reis then began his briefing on the directions DARPA will be taking under his new leadership. DARPA, according to Reis, tries to change the minds of DOD leaders about technologies based on inputs from industry and academia. It seeks "paradigm shifts" in technology by demonstrating new technologies and systems to senior decision makers.

DARPA operates conceptually at three levels: focused science and technology programs at the bottom; manufacturing, acquisition and

¹⁰These programs are summarized in a background reading included in the Forum agenda book for this meeting.

¹¹Copies of the relevant provisions have been sent to members under separate cover.

infrastructure in the middle; and military applications at the top. It is addressing manufacturing in its middle level via balance of product and process technologies, via R&D on manufacturing methods, and via acquisition planning. He intends to make manufacturing integral to all DARPA programs rather than a separate program as in the past, although how that is to be done remains in flux.

DARPA's manufacturing strategy involves three elements: concurrent engineering to ensure seamless movement from design to production, building quantitative manufacturing process models and simulations, and providing integrated flexible manufacturing methods. It seeks to achieve this strategy through a variety of programs, such as MMST (a program to develop a modular approach to manufacture of microelectronics that could eliminate the need for clean rooms), MMIC (a program in Monolithic Microwave Integrated Circuit technology in which cost reductions are being sought via teams of firms and academics), and a program with 3M Corporation on a metal matrix composite model factory.

Of DARPA's budget of around \$1.2 to \$1.4 billion, about \$400 million was said to be related to manufacturing. Most of this goes to contractors, with a small fraction to FFRDCs and to federal laboratories. DARPA's work is in the defense RDT&E categories of 6.1 through 6.3A.

World Competitive Manufacturing Systems

Daniel Roos of MIT, accompanied by his former colleague, James Womack, provided a detailed briefing on the data, findings, and recommendations of their recent book, The Machine That Changed the World.¹² The book addresses the performance of the automotive assembly industry in the United States and in nearly every nation in the world that produces automobiles for sale to the public.

Supported by an unusually rich base of comparative performance data on costs, productivity, quality, product mix, R&D costs, output, labor relations and practices, and so on, the MIT group's fundamental argument is that the Japanese producers, especially Toyota, have developed a fundamentally new approach to production which they term "lean production."

Lean production incorporates and puts in a larger context nearly all of the specific management practices to which the success of the Japanese firms has been attributed over the last decade or so, including low-inventory, just-in-time production; worker empowerment; horizontal organization; concurrent engineering; tight supplier relationships; customer-focused marketing; rapid time to market, etc. They claim that lean production requires less of nearly

¹²Detailed briefing notes were provided to members present and have been distributed to members not in attendance under separate cover. The book is also summarized in materials provided with the January 11 agenda book. Members in attendance received a copy of the book. (James Womack, Daniel Jones and Daniel Roos, The Machine That Changed the World, Rawlson, 1990.)

every input to production including people, machines, money, and time, while producing superior products in greater variety at lower price and with greater customer satisfaction, all while maintaining superior financial performance for the firms involved.

The importance of lean production lies not so much in its specific tactics, however, as it does in acceptance and exploitation of an entirely new philosophy of production. According to the MIT team, lean production is as different from mass production -- the current paradigm -- as mass production was from the craft production that came before. By analogy and anecdote, they argue that the transition to lean production is both necessary and extremely difficult for American and European producers, and that the transition will take decades to occur. They anticipate great resistance to its adoption, but also argue that it will be the method of choice in the future, not just in autos but in the full range of industrial production in which complicated systems of diverse firms and disciplines must be coordinated to produce complex products.

In questions and observations from members of the Forum, it was noted that lean production involves a holistic rather than a reductionist philosophy, based on the fundamentals of shared destiny, technical excellence, and continuous improvement. The relevance of a high level of responsibility by each participant was also noted, as was the importance of centralization of location of production to the successful implementation of lean production. (The latter leads Roos, et al., to suggest that the industrial firm of the future will be organized on a multi-nation regional basis, not on a global basis.)

Roos pointed out that adopting individual techniques of lean production from Japan will not work, because the basic organizational structure matters to their success. In this regard, it was asked whether a firm, or the country, should first pursue "lean production" or do research on "intelligent manufacturing systems" (IMS). The response was that automation yields greater benefits when applied in an organization that is "lean" than when applied to replace workers in a traditional mass production organization. It was also noted that current public policy is not properly oriented with respect to adoption of lean production methods in manufacturing.

Forum Plans for 1991 and Next Steps

Forum executive director, Christopher Hill, briefly reviewed the status of the background papers on the Intelligent Manufacturing Systems proposal and on technology policy and critical technologies reports, and introduced their authors, George Heaton and Mary Ellen Mogee, who were in attendance. He also remarked briefly on the status of the project to develop a national manufacturing strategy.

The discussion then turned to identification of specific areas in which the Forum might make a contribution in the future. Among those mentioned as candidate subjects were:

1. domestic and international aspects of technology strategies as reflected in papers by Bloch, Heaton, and Mogee
2. economic incentives for R&D and for capital investment
3. technology transfer from national laboratories and universities
4. utilization of federal laboratory resources

The meeting closed with a brief discussion of the possibility of changes in the Forum's meetings to facilitate participation by some of the federal agency members whose schedules make attendance difficult. Among the options are focusing each meeting more specifically on a single topic, meeting in smaller groups or task forces to consider specific issues, and scheduling meetings over an afternoon, evening, and following morning to facilitate evening attendance.

"CORRESPONDENCE TRACKING"

TYPE: INFORMATION

DOCUMENT NUMBER: 9120270

FROM: WHITE, ROBERT M.

TO: DR. BROMLEY

DATE OF
CORRESPONDENCE:

SUBJECT: LETTER TO LEON LEDERMAN CONCERNING THE ROLE OF THE
TECHNOLOGY ADMINISTRATION

ASSIGNED TO:

*John R.
Comment 1/8
JRS*

ACTION REQUIRED:

SENDER'S DUE DATE:

OSTP DUE DATE:

DATE COMPLETED: -----

COPIES TO: D. Allan Bromley
Dr. Phillips

WHITE HOUSE TRACKING #:

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REMARKS:

DATE RECEIVED: 01/29/91

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TECHNOLOGICAL COMPETITION



9120270
UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for Technology
Washington, D.C. 20230

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91 JAN 29 A 9: 23

January 23, 1991

OFFICE OF THE
DIRECTOR

Mr. Leon M. Lederman
President-Elect
Board of Directors of the
American Association for
the Advancement of Science
1333 H Street N.W.
Washington, D.C. 20006

Dear Professor Lederman,

I was very much moved by your Supplement to Science magazine entitled "Science: The End of the Frontier?" As a physicist I too am aware of the anecdotal evidence that our science base is eroding.

The role of the Technology Administration is to improve the competitiveness of the U.S. industry. I believe that our nation's declining competitiveness, as evidenced by our loss of marketshare in such high tech industries as semiconductors, computers, and biotechnology, is partly due to our poor management of technology. There is much duplication and subcritical support of new technologies. In the current global economy such inefficiency increases the risks associated with successfully commercializing new technology. The result is that corporations are becoming more and more short term oriented. There is much evidence of U.S. industry focusing its research on more product development activities. On a national scale this not only drains away resources from science, but it also weakens the ties to the science base. This only exacerbates the problems of management of technology, for, as you noted, science today depends upon state-of-the-art technology.

My point is that strengthening our science base is intimately connected with the entire technology innovation process - from research and discovery to product development. I support your call for a study of how to improve "the efficiency and the strategic planning of research funding and ways of assuring that academic research serves the nation most effectively."

Sincerely,



Robert M. White, Ph.D.

cc: R. Mosbacher
A. Bromley 
Congressman George Brown

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

Allan Bromley,
The White letter to
Lederman is very strange.
The second paragraph is
pure word salad - has
lots of mixed jargon, but
says nothing.
Strange...

JN
2/8/91

Bill Phillips & Gene Murray
should also see this
JN