

THOUGHTS ON THE OCCASION OF MY RETIREMENT FROM THE USNO

by
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It is hard to select what I should say at this moment when the experience of a half century of professional life can be reviewed and evaluated. It must be brief because our life is short, and time is expensive, on the average one dollar per minute, per person, including overhead, tools, facilities, and others. Moreover, used to single sound bites, you will not last too long a discourse. Still, I think it is appropriate to do some public accounting, and I will do it in earnest.

I will abstain from being too specific. I will rather try to distill the experience of working in various cultures on two continents into a few general views. They are taken with hindsight which, as everybody knows, is better than that obtained with the best telescopes!

I have been fortunate. First, what I never expected, I survived seven years of World War II and aftermath without major physical damage. Naturally, after this disaster and for a while, I was quite disenchanted with my surroundings in Europe. Prospects did not look good for a career in my chosen specialty, astronomy and physics, but I had obtained the right direction from my parents, and a Ph.D., both invaluable in any circumstance, at any time! Nobody can take these away from you, no inflation, no hostile government.

After working at the small observatory in Graz. some work as an associate at the Institute for Theoretical Physics at the University. and 4 years in industry, I decided to come to this country. Here, I am most grateful for having been allowed to follow my inclinations. Particularly the 10 years I served the U S. Army in various assignments was a time of learning, experience, and professional growth which could not be repeated today under current conditions. And then. finally by coming to this observatory, I was allowed to return to a more scientific occupation, where I could use many of the things I had learned before. Has It been a pure blessing? Of course, not!

But it has been predominantly a fine experience thanks largely to the extraordinary help, loyalty, and friendship I received from most of my associates over these last 28 and 1/2 years. Regarding America, I can only say that the country and the people have changed in many ways since I came with my wife Renate in 1956. Unfortunately most of the changes have been negative from our point of view. But it is still a very great country thanks to its resources and thanks to the founding fathers who created the best political system in existence.

And there are still many great people here, in all walks of life. Remarkably, the spread between excellence and miserable is much greater here than in Europe (the distribution seems to exceed the European on both sides). The most unfortunate development is the increasing polarization and the increasing fanaticism that we observe. I hope that this will be arrested because the most notable feature of this country is its amazing capability for peaceful quick change, which can also become worse, if we are foolish.

I am a scientist, i.e., I seek to observe, and possibly to understand, the world as it really is, and then to give a rational account of it. In my view, this must be much more tentative, and is much harder than anybody can imagine. The Cartesian prescription, to have clear and distinct ideas, is so difficult to follow because to reach clarity, you need time, in my case, very much time. Of course, many people are much smarter than I am, and they can master their problems in a much shorter time, even in the face of all kinds of diversions. However, I think that it is very easy to deceive oneself on this point. In fact, I am persuaded that most of the technological disasters, and the plethora of new but ephemeral theories in our science, as well as the notorious cost overruns, are caused by woefully inadequate thinking.

The recognition of this, if indeed it is recognized, puts the responsible executive before a real dilemma: How to allow, nay encourage people to go to the bottom of problems in the conceptual or design phase, while at the same time to cut off further "procrastination" and go ahead with the actual production. I am convinced that most executives err on the side of allowing an insufficient amount of intellectual work before forcing the transition. Examples for this are all around us; in the computer industry we have the well known vaporware which never materializes because the haste and the initial sloppiness create overwhelming problems in the implementation phase. But even in the pure intellectual domain, the information pollution, the flood of unnecessary papers (and speeches) is caused by a lack of sufficient thinking due to the pressures to publish and be heard. The practical consequence of this behavior is a growing disenchantment of the public with science, i.e., less and less science support!

In my case, I believe that I have probably been a little too cautious, and I do not think that I rushed into nonsense too often. A few minor mistakes, yes. But there is a major one which is on my conscience even though we acted properly on the information available at the time and were following established plans. However, I failed to obey my instincts! I refer to the VLG 12 (fast adiabatic passage) masers from SAO. This program turned out to be a disaster (\$1.7M), at least until now. There is some hope that we can eventually modify the 4 masers in question at an acceptable cost.

It is remarkable that the insufficient intellectual effort that I decry in general, is made worse by a change in practice, due to a change in thinking, that has taken

place during the last thirty years in the personnel policies in this country. Thirty years ago it was clearly understood that professional competence and experience in the tasks at hand were a major and indispensable part of an executive's qualifications [1]. However, this was changed by the new thinking in the management schools in this country. Management became a profession by itself, the same way as teaching. You used to be a teacher of mathematics, or english, or history. But now, you are trained to be a teacher, as such, with the specialty relegated to secondary importance. The same thing has happened to management. Suddenly, people, who had never been actual researchers, became directors of research at the highest levels of industry and government. And today, the actual decisions of what gets done, are made by "analysts" in the controllers offices. I think that this is not a sound development, and the country is paying for this folly with a slowly decreasing standard of living relative to others and/or relative to what we could enjoy as the result of a greatly improved basic technological state-of-the-art. Fortunately, we have now some indications that this is being recognized as a problem! This is why I was so pleasantly surprised when I discovered recently that a visiting high level Navy Research official actually knew what he was talking about.

The change in management thinking has gone so far that in the Senior Executive Service a regular rotation of assignments is now the accepted policy. When I was due to be "rotated", a special waiver had to be obtained, otherwise someone from an entirely different area of experience would have arrived in my place. Frankly, I think that this idea, as implemented routinely in all but a few cases, is idiotic. It is just another indication that the people who direct this nonsense do not know what they are doing. They seem to be so remote from reality that they completely lack the judgment to see the effects of such a system. And what could be the reason for this aloofness?

I started my work at the bottom, with the result that I could do any detail within the assignment of my unit, including soldering, cable pulling, whatever. It is hard, I hope, to "snow" me on any of these details. As a soldier, I started in the stables and was responsible for three mules (it was a mountain unit). That is why I know how it is when you do the work that I now direct! (It would be tempting, but do not read here more than what it says).

My second great advantage has been that I had the opportunity to learn, from my father, my father-in-law, several of my superiors in my various assignments and finally from my famous predecessor at the observatory, Dr. William Markowitz. Mark would have been a very hard act to follow except that, fortunately due to the changed circumstances and changed requirements, I could, and had to, follow completely different directions. Instinctively I knew I had to use my own strengths and should not continue the old ways.

But here and now? What seems to be the accepted practice? You get a degree from the university and you can get immediately a high administrative position with the way open to the top without ever having done the work of the people you direct, or having seen the effect of decisions that were taken in your presence after agonizing about them. In addition to the lack of experience and the aloofness from reality, the worst aspect is that this tends to induce a despicable arrogance and superiority complex. Lastly I also believe that it is immoral to ask others to do what you never wanted to do yourself!

Regarding science proper, I have been attracted to astronomy because of its aesthetic values, and later, its philosophical aspects. The classical part of it has the justified reputation of being the prototype of an exact science. The opposite is true today of astrophysics and cosmology which have become the playground for intellectual adventurers. Historically, real progress is likely to come from those who do not always follow the party line. I exclude crackpots, of course. But real scientific progress only comes from a revision, or the invention, of new concepts in combination with new observational discoveries. And these concepts must be based on more safely established grounds as compared with the frequent practice of publishing ad-hoc hypotheses whenever new observational discoveries are unexplained. I cannot resist the impression that many parts of our present science are unsound and will not last. The major reason for this is that the rapid development of instrumentation technology, and the unprecedented huge support that has become available (as measured against the level available before World War II), in combination with electronic communication, have so inflated and accelerated the pace of work that nobody can afford the time to ponder, to contemplate, to let ideas mature. Another reason may well be that many researchers really do not understand the foundations of their science, accept things largely on the basis of beliefs, and as a consequence, defend these beliefs equally blindly, not willing to face the possibility that they may be wrong. Thomas Kuhn has elaborated this observation in his theory of changing paradigms [2].

Even more questionable is the real motivation that guides most of the present scientific enterprise in general. I am convinced that it is a grave mistake to justify pure scientific work on the basis of curiosity of the individual researcher. The public will not understand this, which is the reason for the funding problems. In addition, it is unethical to extract other people's money forcefully, through taxes, to satisfy personal desires. Since we cannot claim direct utility for basic research, which would almost be a contradiction in terms, we must seek its justification through indirect and long-term benefits for society at large. These benefits can come from only two sides: a. From the increased competence of the researcher. and b from improvements to society if, on the basis of our research, we can widen the views of humanity about human existence and human goals. This brings us back to the philosophical basis of, and reason for, pure scientific work. Because in our Navy environment the only reason (a) is

mission compatible, we must justify some of our work, as far as it goes beyond the actual production of operational data, or the development of new tools, as being necessary in order to stay in the forefront of competence. We know from experience, that scientific technical competence, sooner or later will be required by the nation, in defense, in our technological competition with others. That, of course, is the basis for the criterion of relevance. To support the complement (b) is, on the other side, the mission of the National Science Foundation (NSF). Unfortunately, clear and distinct ideas do not always rule, or are even understood, just as everywhere else.

Quite often I had to be an engineer when practical problems were to be solved - on the basis of incomplete knowledge. My early interest in radio technology has helped me significantly. Actually, much, if not most of what we do in Time Service is applied science and engineering. Officially, I have been an executive, but it is quite ironic that I find it hard identifying with this title because I see too deep a clash between the public perception and the image of the executive today, mostly a mere bureaucrat (faceless, of course!), with what I want and actually do. Of course, one cannot do much alone, we work in teams, and teams need a focal point from which discipline, order, and much initiative emanate. We must also not forget the need to bring meaning into our work and life. Meaning can only be given to our work if we understand what we do and why, and it is the leader's most important educational function to explain that as well as he can. But those things will get rarely into our job description. This important point is also not appreciated in the otherwise excellent study mentioned above [1].

Have I performed sufficiently? I think I deserve a passing grade. Only passing because I know I did not really do as much as I could have. And why that? We all know how many irresistible diversions come along every day that prevent us from concentrating on our job. And concentration is the secret of all success! I simply did not want to waste our collective time more than absolutely necessary, but I know today that I was too sensitive to this concern, everything considered. And the judgment of my performance must also admit an insidious decline of energy during the last year, a decline which even my old working habits could not compensate. But to my younger colleagues I can tell, that this happened only in my 73rd year. Before, I still felt that I could pull out trees!

That I achieved anything is, of course, due to the help and fine cooperation I received from my colleagues and coworkers. I am really proud for this first-rate team here at the USNO which, by and large, is so different from the unfortunate public perception of the federal worker. But it is also due to my holding out and persevering in my views of what had to be done. I simply survived all obstacles. Is that long-range planning? Not as I see it. With the exception of strategic considerations, much of today's overly detailed planning is a waste of time because things change too rapidly. The real problem I have with it, however, is different. If you need to work ahead of everybody else, it is necessary to feel

your way forward because there is no precedent and we cannot predict the conditions we will meet even in the next year. Preconceived, simple and abstract notions as embodied in elaborate plans, are a real hindrance, even misleading, and as I believe, a waste of effort and money. Clearly, you must have some vision of where you are going, otherwise you will be lost. But this vision must be through intuition on the basis of experience which is always superior, and must always be the foundation of all abstract operations. Otherwise we build castles in the blue sky.

But wait, did I not just before say that we need clear and distinct ideas? Yes, of course, but each in its proper place. When we analyze we must seek clear abstractions, otherwise we cannot communicate what we find. If we must act, however, generalities are of very limited use! And often, they are definitely harmful. Just think of the monumental mischief that fanatics of all sorts commit every day, always on the basis of their only too clear and simple ideas! People, especially young people, have a very deficient, certainly much too narrow yet inflated, concept of human intelligence and they fall prey easily to "brilliant" ideas. To appraise our intellectual capabilities on the basis of the achieved scientific and technological progress is quite misleading because this is almost entirely due to the social interaction. As individuals we are almost nothing and a massive dose of humility is needed. To achieve success in anything, it is essential to understand, nay, to be mentally penetrated by the realization that the world and nature is absolutely independent of our desires, wishes, ideas, whatever. It is merciless if we err in estimating the real state of affairs. We should remember that our future-directed reasoning and planning is almost always erroneous. The only chance we have is if we have recourse to an experienced team consisting of various different abilities and experiences. I have enjoyed such a support and I have tried, deliberately, to use this resource to the maximum for finding the strategically best directions. This is also a major reason why scientific work profits so much from an easy exchange of information and opinions. This gets around the weaknesses of the single mind.

Really necessary are two things: First, one has to be prepared for the unexpected by honing one's skills and understanding, using all available time, including all "free time" (I put quotes here to hint that a professional has a profession and nothing else if they want to remain a professional. In [1], p. 92 it is documented that additional study must be done at home, to a large part). We have to be serious before we accept any responsibility. That is the reason why habitual frivolity is so grave a deviation from the right path for the leader, and why I place such a high value on simplicity and frugality. But how can I say that, does the Constitution not allow us the right to pursue happiness? Yes, happiness indeed, and that is quite different from frivolity. Because true and lasting happiness comes only from the right and competent use of one's capacities. And to be able to do that, we need discipline and frugality. Otherwise we end as hopeless bunglers who become quickly obsolescent.

Second, one has to take opportunities as they arise out of the chaos of today's world. But of course, you have to keep your goals firmly in view when you do this. I have rejected countless pseudo-opportunities which would have only wasted resources.

Among them have been the avoidance of useless fights and arguments, or simply an imitation of the competition. One must exploit one's own strength! And follow one's own star (if I am permitted to say this here!). This then is a very important requirement, to keep direction overall, regardless of the always changing ideas and directives of the ephemeral environment. I would propose to call this practice "critical opportunism". Unfortunately, with age, one becomes more and more critical, on the basis of too many observed disasters, and eventually too critical. That is why, at that point, one has to leave.

It is also ironic for me when I remember how doubtful I was as a young person that I could accomplish anything. With hindsight, I believe today that I was simply too sensitive to the problems I saw and, being somewhat a perfectionist, I did not understand that somehow one has to be practical and accept less than absolute perfection. I simply had to acquire confidence that things will tend to turn out well if only started in the right direction and pursued with maximum effort. But so, I was always hoping that something would happen that would relieve me of my assignment, whatever it was, because I thought I could not possibly carry my hard task to its completion. That would have predisposed me to become a job-hopper, always leaving the job before one's incompetence becomes too obvious. Well, I do not think that I can be accused of that, having remained on my last job for 28 and 1/2 years. I had to pay for all of my mistakes! Then how could I last that long? I do not wish to dwell here on the development of my motivation but a major component has been that I managed to be truly interested in most of what the job demanded. Try to be interested in your tasks and you will succeed beyond your wildest expectations!

But here lurks a serious danger, especially for us scientists who lean towards introversion. As a rule, with all concentration on the subject, we are not very interested in other people, in fact, unless we are in love, we would rather be left alone. Certainly this has been my strong inclination. There is nothing I like more than to be able to read, study, contemplate. However, this will not do. Not if we accept responsibilities for others. One simply has to be interested in one's associates, coworkers, potential adversaries, whatever. And the interest must be as objective as possible, and yet sympathetic, a very hard task. Unless we reach objectivity, we can't see things as they are but will only see them as we fear, or hope, they are.

Furthermore, if we manage to have this interest in the persons with whom we deal, we will find out rather soon that we should also be generous and warm in our dealings. Even the less perceptive realize eventually that the human

situation is identical in its most pressing moments: We suffer the same pains, the same doubts, the same insufficiencies (because we consist of the same stuff). And eventually, everything comes to naught. Therefore, we need mutual solidarity, so why not be a little more understanding? Try to see it from the other side and not only from your own. Are not most of the so-called communication gaps (except those caused by oversight or lack of time) rooted in unnecessary and mostly unjustified emotional hang-ups? I have seen too many of those here at the observatory! There should be no place in our work for petty jealousies, gossip, and intrigues. We only damage ourselves and lose precious time for much more important things. And there should also be no place for unwarranted professional or other arrogance. Need I remind us of the childish feelings we suffer if a colleague forgets to mention our papers? At this point we lose our cool objectivity and become very small and insignificant. Moreover, the not always hidden hostility to the offending person remains in us just like a festering sore, poisoning our future relationship and hindering cooperation. We must cut out these emotional sores and regain our basically friendly and open attitude!

And that "personality" syndrome is only the beginning. It is truly appalling to recognize that almost all human suffering (except earthquakes, the unavoidable loss of our loved ones, and some, by far not all, disease) is man-made. Therefore, generosity and help, urged by all wise and holy men and women, is the most important example we must give to each other. And only very late will we see how miraculously our generosity comes back to us, quasi as a fringe benefit, having been generous eventually with ourselves.

Before I am misunderstood, I must state categorically that I do not recommend tolerance of sloppy, listless incompetence or worse antisocial behavior. It turns my stomach to see the growing signs of this attitude everywhere today. It is the tragedy of our culture that a well-meaning but totally misunderstood humanitarianism has corrupted the fiber of our society. The result of decades of misguided activism, even patronizing, and of a corresponding lack of alertness by everybody, is now plainly visible. The very opposite of the intended has happened. Unhappiness, reaching the degree of madness threatens to make all orderly civilized life impossible for all, particularly for those whom the activists tried to help in the first place. We must insist on order, discipline and acceptable standards compelling for everyone. We all need some external control. Without a return to order and quality in our lives, I cannot see how our society can survive the next 20 years. Less and less can we depend on a responsible and sensible performance of duty on the part of our compatriots. More and more is going wrong because somebody has been irresponsible, sloppy, thoughtless, or simply incompetent for his/her Job. We must turn this around and everyone must do their best share. The goal cannot be achieved automatically, education in this sense cannot be accomplished by a system, and even if it were the finest, all by itself. Our culture can only be restored if we manage to make an activism that is directed towards oneself, the fashion of the day.

It is instructive to remember that our problem today is not new, even though, fortunately, we have many more resources than anybody ever had before. No civilization ever has been able to survive the arrival of luxury for its people. The opinion becomes widespread that in view of our affluence as a society, we can afford to loosen up, but this is not so. It is the core of our problem, to provide a framework, how to teach, how to induce our people to enjoy their affluence, without becoming lax, lazy, and corrupt. In other words, I see the only way to our survival in a return to a largely self disciplined society. It remains to be seen whether this will be possible. But how else can an ever increasing technical sophistication, the basis for all the luxury in our life, and soon for life itself, be maintained?

On the other side, it is also a grave misunderstanding rooted in an excessive scientism to lay the blame for sloppy, listless incompetence on fate and heredity. Human action, at the moment of decision, has nothing to do with causality which is an objectivist concept. Whatever statistics says, it can say it with certitude only after the fact, essentially by giving the observed relative frequencies; any 'prediction' for the future can only be statistical, not individual, and it rests on very fragile inference. If I am lazy, I cannot excuse this by saying, well, my genes did not have it, after all. That is nonsense!

I am lazy because I am weak and I do not like to exert myself. If I have not tried, I can't know what my material nature would have allowed me to do. And if I reject that nonsense excuse and make the effort, and persist, I will build good habits and the practice will make the task easier and easier as time goes on. Therefore, I claim that motivation, drive, and even intelligence in a loose sense, are largely the result of character traits, which I must build myself, encouraged by good examples and training. All this is very much under our conscious control, but only if we try! And we must induce and help our associates with their efforts and respect their accomplishments of whatever kind. It is beyond question that today the problem of motivation is, or should be, at the top of executive concern. It is not hard to imagine what a general rise of only 10% in the motivation for quality would accomplish in our nation, and particularly in the government. It is interesting to speculate how much this problem is the result of a confused, or totally absent, concept of the common goals of a rich society. Totally absent are the goals of herds of pigs, but should not be in a human society, as was remarked already by Socrates.

I have worried about motivation during all of my professional life. So much so that about a decade ago I gave a seminar on "Self Development" for mature people [3]. At the time, I was very happy with my effort. However, I see now how silly I have been. A single exposure, a single reading will do very little to change life-long habits and furthermore, our whole environment is not conducive to motivate the individual for quality. Jokingly, I would say, that real work has become unnecessary, only the appearance of work is needed. For this reason.

general management action, such as the notorious TQM (TQL in the Navy) is also of little use unless we can change the whole set-up and make thinking and habit building an essential part of our working day. To be candid, up to now, the whole TQM is just lip service, just another fad, another reliance on structural, organizational thinking, initiated by top executives who are only dimly aware that things are not going too well. Total quality? I must smile when I see a speech by the Secretary of the Navy in print in which he complements (!) people for their accomplishments. Clearly, we have a momentous task if we want to raise the tone of our large organizations! And I strongly believe that the right place to start is with oneself (because we cannot wait until all of our leaders do it; they may even be incapable).

It would be of the greatest importance for our society, and for our little organization as well, if everyone could find an occupation that is fully satisfying and that can exploit the individual gifts so that each person can reach their full potential. After all, the profession, our work, is one of the most important things in our life. The full utilization of the total talents of the nation would also do away with any problems of competitiveness, currency imbalances, and the like. But we are everywhere far from even a general recognition of this. We only talk of jobs and not, as we should, of professions. Jobs can be changed from day to day, but professions demand a commitment!

Of course, people are very different from each other, with vastly different talents and hidden gifts. This is a wonderful aspect of nature, this incredible degree of diversity. Unfortunately, we do not seem to value it, or to make proper use. As an example, we do not give sufficient opportunities to all young people to learn about their own potential and preferences. Therefore, we must be prepared to allow lateral movement, several times if necessary, so that each person has the opportunity to find the best assignment. Not best in the sense of least work, of course. But best in the sense of greatest development potential. A related problem exists in that while we do have good vocational education available, the "cultural elite" seems to underestimate the importance and worthiness of a good trade education for a large part of the population. It is simply not true that only a college degree can produce qualifications. How silly, how deceptive! We fill degree-requiring jobs with incompetents, while necessary support functions are not taken up by those who could, or would do fine. Instead of letting people desire what they want to do according to their inclinations, we push them into colleges wholesale. That is not a good idea. It is as bad as pushing food or information into children who do not want it. The result is an aversion or a blase attitude that prevents them to develop real interests and motivation. We find so many people in this country who do not know what to do. It is a scandal that, in the face of the greatest opportunities for a fine, full life so many become crazy; is that unavoidable or is it a failure of the civilization itself? Or is it the human fate that we cannot stand well-being? If, what I suspect, the second is true, that would mean that our most cherished ideas and policies would have to change.

It is also true that the Civil Service is not an enlightened employer. Otherwise, it would be much easier to arrange things so that the people can do their job conveniently and in good spirits. We as managers have to overcome the problems that are common to all large systems. In reality, there is not much we can do except persist and pacify irate workers who have to spend a large part of their time with useless paperwork that could be done, if needed at all, by the computer. And how do we fare with the tasks of moving the capable person into jobs where they can use more of their talents? I mean the problem of promotion to a more responsible position. This, and the recruitment of new employees is, perhaps, the worst aspect of our bureaucracy. I only know that, as a private entrepreneur, of a small company, I would not have these problems. At the USNO this is not a new problem. One hundred years ago, Simon Newcomb complained about the situation bitterly [4]!

But could any large system be an enlightened employer? Given the fact that certain controls are simply required to prevent large-scale abuse, I cannot see how any such system could exist without some formal bureaucracy. Therefore, it is useless to complain about things, and much more productive to arrange the programs so that the bureaucratic delays are taken into account. But this is made almost impossible by the excessive controls that are applied on several levels. The system is presently vastly over-controlled, without a doubt. I have observed this gradual increase of bureaucratic control during the last 30 years. It was started by Robert McNamara who, by overdoing things, achieved the opposite of what he intended. I hope that this can be corrected eventually.

Coming back to our consideration of causes for human behavior, from a purely objectivist (scientific) point of view, a view that cannot possibly do justice to the questions of subjective choice and the subtleties of the human soul, we infer causes after the fact and assign statistically the failure of drive and initiative to (mostly) genetic causes. Another example that a little, but vague and superficial, knowledge can be quite dangerous for our success! And it is quite alarming that this vagueness, nay mistaken understanding, is all that seems to govern the subject national debate, even though that is not a unique situation.

Where are the values? Have we forgotten that they have a great influence on how we decide? How great it would be if our media could teach the basics of statistics to everyone (actually we need first a commonly accepted concept of decency but that may be too much to ask). This could have a tremendous impact because recognizing that every "bell curve" has individuals everywhere. the location where one finds oneself is co-determined by the efforts one is willing to undertake. There is no doubt in my mind that if everybody would try in earnest to find out how far they can go, the whole measured curve would be shifted substantially towards higher performance. But so, under the present materialistic, simplistic bias of our culture, people are given a wonderful excuse for not trying, for not even being interested, by blaming it on their genes.

Apropos "Bell Curve"! This is a highly Interesting, well written and meritorious work that deserves study and serious critique, and not the kind of silly comments as we have heard from the President of Rutgers University (and many others) who deprecates it while he states that he will never read It! What an intellectual scandal! I believe that at least part of a justified critique has to start from my comments above.

The result of training, of trying hard to improve himself, is largely unpredictable in the individual case. Of course, training has to start very early but the schools have weakened the incentives, i.e., valid grades, because if they happen to be poor, grades could damage the pupil's self esteem! The truth is that grades ought to be the tool to advise the individual on where their strong and weak points are, indispensable information for a wise selection of the kind of work for the later adult. People are different and a good supervisor has to try making assignments on the basis of demonstrated skills and interests and not on the basis of a pre-arranged organization chart. At work, the above principle would lead to the impossibility for a supervisor to provide performance ratings, a sure way to ruin all productivity. This is exactly why Communism could not succeed with providing an acceptable standard of living for any except the party bosses. But the bitter truth is that with the ever increasing population density, and the ever increasing dependence on technology, we all would simply starve if we would, but I sincerely hope that we won't, continue the present path of misguided humanitarianism by losing sight of quality and performance.

And there is another, enormously important point, too much neglected in the debates that I have heard: A poor cognitive ability, i.e., the notorious intelligence, as revealed by a test, is not and must not be the reason for any unfavorable rating of the person as a person. The only purpose of such tests can be as tools to guide the individuals into work areas that are best suited for the expected abilities. Value ratings can only be based on the actual performance in life, the efforts expended, the character revealed. We all differ in what eventually we can do; but we all have the ability to avoid the wrong, to chose the right, otherwise we can't call ourselves human. We owe the highest respect to the person who does his job well, whatever it is. We ought to despise the person who is despicable because of what he/she did. The trouble today is that we do not act this way: We accept the most despicable performance of the notables, and pay for them enormously through the media, or buy their books, or continue to vote for them. And the public is always ready to excuse anyway. That is serious.

It brings me to a related point, where the danger of misunderstanding is even greater than up to now. As I said before, I came to this great country voluntarily, I am grateful for what it gave me. But I believe that I should not necessarily have to accept all those things that I hold for weaknesses in our present setup. I do not accept the degree of hypocrisy and open lie to which one is exposed, and

worse, into which one is forced. To test this proposition you just have to observe how far we accept advertisements, or how we create "a friendly atmosphere" in a meeting, or when we try to answer the question "How are you?" truthfully. This is a serious matter because we have accepted routine hypocrisy into our culture where it hinders us to face the facts. It cannot but create grave dangers in an insidious way.

Even more serious, nay disgusting, is the shocking waste and the fascination with ugliness and violence, instead of cultivating beauty. I can only hope that the greater frequency of travel and the modern communication tools will teach our people that what we neglect here is the source of life enjoyment elsewhere. I also hope that more people will eventually realize that our culture can only be improved, our communal life experience deepened, if each person does the improving him(her)self! In other words, let the activists be activists with themselves! Really, if all the energy that is now directed at regulating other people's lives were directed at the originators themselves, a paradise would immediately arrive. In fact, in my conviction, efforts towards the regulation of others, which go beyond giving example, guidance and advice, organizing the most essential functions of society, and keeping in check the truly criminal elements in our midst, are basically unethical! Too weak to regulate yourself, you want to do that with others? Shame on you! I know, of course, that my role model Socrates, so to say, was executed by his compatriots. I ought to be silent from now on.

One of the main sources of time for my own study has been my early recognition that the mass media are not only a terrible waste of time, nay they are far worse. Under the guise of "information", they actually open for you the floodgates of a cultural and intellectual sewer. The dangerous aspect is that this sewer has been made to smell attractively good, at least superficially. It is a mistake to think that information is being provided. No, it is (poor) entertainment! There are great exceptions, of course. But they are rare and the vast majority of what comes into the home via TV, radio, and mass literature, is garbage and must be recognized as such. I am so upset about this because here in Washington, as well as in most cities in this country, we have an almost unlimited amount of genuine solid information available. We have the Library of Congress, we have our own, so professionally managed library. And how often do we use it compared with the time spent on TV or radio? Evidently, we value genuine information less than the miserable gossip with which the media try to entertain us. And let me confess something else: I did not hold my position because I worked my head off. But I also was not lazy, I believe I can say this. But my real asset has always been that I simply knew more details than others. Kaj Strand, the former Scientific Director, the man who made me come to the USNO, once said that I was a walking repository of useless information. I flatter myself in believing that he joked!

There is one more point that I hesitate revealing: In my experience, and more so recently compared with the past, I observe people at work who are simply unable to come to a quick understanding and agreement because they cannot listen to each other. Unless one has an open mind, in its proper sense, it is very unlikely that an effective exchange of information can actually take place. We must listen while we assume that our partner may be right; then it IS up to us to find out how, and in what sense, we can understand him. This is not generally done. We rather adhere to the contrary principle: That the responsibility for understanding is supposed to rest entirely with the speaker. If I do not understand, it is entirely his fault. However, why then, in that case, would we need an open mind? But again, I must quickly add the complementary requirement, to be critical in listening. It is amazing how much obvious nonsense can be peddled in the media and at work (!) without immediate criticism.

But wait, did I just state two contradictory things? Am I giving double talk? It may appear so if one is not used to the wonderful principle of complementarity (in Bohr's sense); in other words, the world is too complicated for single minded aspects. Many people would prefer to receive simple, clear cut, information; no ifs, ands or buts. Yet we must get used to dealing with situations in a more deliberate, sophisticated way with all needed qualifications and exceptions. This is often a real problem when we communicate with each other. We must strike a balance between clarity and truth. The simpler our language becomes, the less realistic it will be. Judgment and balance must be sought in every discourse. Extremism is a vice! Seen in this light, a call by the impatient executive for the "bottom line" is but an invitation for lying.

The desire for simple, clear instructions is natural and it can and should be met wherever possible. I must apologize to my friends and associates, however, because I know that I violated this rule many times in the interest of another goal: make people aware of the surroundings of their work and problems. In that case, one cannot but provide a more complicated picture than can be given in the yes-no, no ifs, no buts style. It is just like picturing a landscape. If all you can do is giving black or white dots (pixels), you suppress two whole dimensions, color and intensity, and you abbreviate the total information to a dangerous degree. Therefore, my style has been to paint colorful pictures and watch if people liked them.

When I look back on my life, I often ask myself whether I would do the same things today? The answer is mostly No! On the basis of later experience, I can see how foolish I have been in the past and, of course, I would do it now much better, or not at all, seeing countless details, opportunities and consequences for which I have been totally blind at the time. Today, I have the vision; however, it is too late. Much too late. I will never have the opportunity to repeat or correct these earlier experiences, and the lessons I learned from my mistakes will serve nobody - unless I find others who are willing to listen to my stories! But this

happens very rarely, because we humans insist on learning only from our own experience and from nobody else's, and this is not likely to change.

To conclude: With all mistakes, my professional life has still been a great experience; I have been able to do everything I dreamed about as a young person. My time at the USNO has been most challenging, most interesting. It has stimulated my intellectual growth in a, for me, astonishing way. I have met many remarkable people, from many walks of life. Time, after all, concerns everybody. all systems, in one way or another. I am grateful to all those who helped and encouraged me (or at least, did not hinder me).

Is there something left? Oh yes! It is a great blessing reaching old age without losing your mind. The diminished eye sight is more than compensated by much better intellectual vision. Given the state of affairs, this creates a burden and frustration. That is the price one pays for facing the facts. But I also see many new interesting and worthwhile things, that I could take up if, and that is a grave question, if I can muster the energy. You run out of steam, one cannot deny it. A life of action requires an enormous expense of energy and age reduces it, unavoidably. However, being a scientist, I am more than ever fascinated by the world, watching nature and things breathlessly, and contemplating the causes and interconnections. Quite a bit of this can lead to useful contributions. Therefore, I really do not intend to retire, I will just change occupations! And I say with Solon, while I grow older, I keep learning new things every day.

General MacArthur, the great soldier, in his last speech at West Point voiced the three main ideals of the soldier's life as Duty, Honor, Country! (He took West Point's motto as his theme). I admire this greatly. However, as scientists it behooves us to focus differently: Study, observe, be objective and contemplate! Only then can we hope to understand, and thereby be useful to the society that supports us. We must never forget that we, too, are servants, and that we, too, must be grateful to those who support us in our work.

Felix, qui potuit rerum cognoscere causas
Vergilius, Georgica 2,490

References:

[1] John J. Corson and R. Shale Paul (1966), Men Near The Top - Filling Key Posts In The Federal Service. The Johns Hopkins Press, Baltimore. LCCC# 66-17010.

[2] Thomas S. Kuhn (1970), The Structure of Scientific Revolutions. The University (Chicago Press. ISBN 0-226-45804-0

[3] Gernot M. R. Winkler (1985), Self Development. Lecture Notes available from tt DT Office, USNO.

[4] Simon Newcomb (1898), Astronomical Papers, Tables of the Sun, VOI.6, part 1, p. 3

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