COMMENCEMENT ADDRESS

Delivered by William Blakemore at the graduation ceremonies of the class of 1974 of the American Community School of Beirut, Lebanon, held in the American University of Beirut Assembly Hall/Chapel, Friday, June 21, 1974 at 9:00 A.M.

Thank you Mr. Usellis.

Parents, teachers, friends and guests, and especially graduating seniors – Today we are gathered together to do ourselves honour by celebrating something we don't completely understand, remembering the hopes of our clearer moments, and giving you who have finished the years of your early education – which you didn't ask for but probably felt was generally a good idea – a send-off which you deserve more than you probably know.

There is a grand tradition of clichés which today will not be clichés, an ancient procession of ceremonies – of Greeks carrying parchment scrolls, Hindus entering sacred temples, Blackfoot Indians walking out of the wilderness, of secret initiations and open oratory – which, though it is nice to think of them, will evaporate into their proper irrelevance as it all happens here, and for us, for the first time, – as we tangle our memories with our expectations of significance, our relief with our joy, and walk out into the sunlight delighted and not needing to ask why.

Ceremony is a natural need. It passes inevitably through periods of disfavor when it is imposed with ulterior motives, or when it bears the marks of mindless repetition or weakening escapism which encourages fear. But there are times in the progress of any major endeavor when that endeavor has to be acknowledged, when we feel the need to express what we've been suspecting all along we might be up to. And we who are watching you graduate have this need at least as much as do you yourselves, and will get at least as much pleasure out of it as you will. – And not only because there will be so many wise elders here watching with incomprehensible love as their children grow up in front of their very eyes, but also because the formal giving of awards is often one of the happiest forms of self-congratulation humans indulge in. Teachers and administrators compliment themselves that what they have had a hand in is worth doing when they get so definite as to stop everything and make graceful the particular handshake and the handing of a diploma.

Of course it is expected that this should happen, but such expectations

are not always fulfilled, or fulfilled happily. Nor should the apparent inevitability and uniformity of these diplomas, or the ability of your minds to remember more easily the pleasant experiences than the unpleasant, allow you to forget that these diplomas are genuine awards for achievement - which, at least some of the time, probably seemed more like natural fun than work.

You earned these degrees, even if you bear no physical scars from your private epic battles with logarithm and syntax, ripple tanks and histories. - With those wonderful late night hours before the paper is due or the exam is to be sprung when you realize that after all you do have some good ideas and the subject is perhaps after all a bit more interesting than you realized but what a pity and strange coincidence it is Chat this discovery should come when it does, though all is certainly not lost. - Your years-long epic tussles with learning to tell the difference between the letter R and the letter K, with spelling 'business' and 'believe', then with wondering what a pentagon is, or The Pentagon, with paragraphs and graph paper, tutoyer's and twilight phenomena, who in heaven's name was this Shakespeare anyway? - then the profound crisis of trigonometry, the hopeless suggestions of relativity, the socio-economic profiles of South Lebanon and North America, East Anglia and The Wild West; why birds are not cross-eyed, humans have livers and Picasso tradition. Words, numbers, photographs, erasers, ink and eardrums have born it over and over; grades and comments have given way to pride and hysteria, self-doubt and a dangerous fascination with the arbitrary, to contentment and assurance. And all of this has given way to today.

But clearly what we are here to celebrate today is not merely academics - not merely book-learning, class-performing and paper-composing. The whole life of the school has been after all a central portion of your very lives for these past years, and teachers, who know that their ultimate purpose is to make themselves unnecessary, also know that you probably learn more, or acquire more, from your friends and from your explorations of what you want and what you think you want, from exhausted day-dreams in the locker-room or the thrill of becoming somebody else on stage or from collisions with sea water. What we are here to celebrate today is for no one of us to measure or know or understand. All these things have taken care of themselves. And it would be blasphemous to think that we had much to do with causing these countless variations, or that we need to categorize them, and tedious - and perhaps even heart-breaking - to try.

What is interesting (among other things) on this occasion, is to consider what we do <u>not</u> know, what we have not learned, - to consider the basic insecurity of all knowledge, especially what we call scientific knowledge. - To recognize that what

we have acquired, and will acquire, is more verb than noun, is good conditioning and exercise at dealing with more than having. - The opening of mind and body which will allow us to see more and more that truth is always stranger than fiction, and that the most complex, or technical, or even the most simple scientific statements are not theories that we have discovered to be true, but rather simply the best theories we've got so far.

For the idea of certain fact, and of proof itself, is something which belongs only to the domains of mathematics and formal logic - not to biology, or literary criticism, or education, or physics. And the knowledge we have of the world around us - and which gives us the feelings of security that enable us to go on from day to day - is radically different in many ways from the knowledge of the world and universe into which our grandparents grew, and almost certainly from that into which our grandparents will grow. And philosophers of science are coming to believe that it is much more logical to expect that events will NOT happen in the way they have before, rather than the other way around.

Take the case of Evangelista Torricelli. (He was Italian. He lived 350 years ago in the height of the Italian and European renaissance.) In his world it was common knowledge, or just common sense. Chat where there was not earth or fire or water in nature, there was air, and that all of the distant planets and stars swam through the air just as the Earth did. They had no conception, as we do, of the partial vacuum of outer space, or the upper limits of the atmosphere, nor of the weight of air. If they had had a winged aeroplane they would have assumed that it could fly them to the stars.

Torricelli meddled quite a bit in what we now call physics. And one fact that intrigued him was the fact that in a normal suction pump - basically the same kind we see on old farms with a long pump handle - water could only be raised to thirty-four feet. Not thirty-three feet and not thirty-five feet. It didn't matter how big the pump was, or how small. Of course not everybody in Italy at the time was wondering just why it was that water rose to just exactly thirty-four feet in a pump, but Torricelli, because of the various experiments and studies he had made in the realms of mechanics and natural phenomena, had a feeling that this was the sort of thing which one ought to be able to explain. But he had no idea how to do so, so he put it at the back of his mind for a while and went on about his other occupations.

Then one day (or night - we have no exact record of just when) he had an idea. He remembered what he knew about the sea, about water pressure, and about the fact that the deeper you go underwater

the greater is the weight that bears down on you from above. Water has weight: the more there is piled on top of you, the more you feel it. He had an amusing, wild idea. Perhaps, he conjectured, there is a "sea of air" around and above the Earth just as there is a sea of water down on it. A crazy idea of course: it would mean that air itself has weight, and that there is a certain distance, perhaps not too far off, beyond which there would be no more air (or anything else perhaps) and that the planets and stars were somehow suspended in ... perhaps nothing. It was an idea which had many new and disturbing ramifications, but at least it would explain why water rose only and exactly thirty-four feet in a vacuum pump.

The next thing Torricelli did was to try to find some support for this idea. He figured that if he took a glass tube, closed at the top and open at the bottom, and created a vacuum inside by pumping out all of the air, and then submerged the open bottom end in an open dish of mercury, then the mercury should rise up a certain distance in the vacuum tube because the air would be pushing down on the mercury in the dish - while there was no air or anything else in the glass tube to prevent this mercury from being pushed up into it. What he did was to invent the first barometer.

Moreover, he figured that the mercury should rise up to just a certain height: mercury is heavier than water and if air could hold up a column of water thirty-four feet high, (and mercury is, say, ten times as heavy as water), then the weight of the air should be able to hold up a column of mercury one-tenth the height of the thirty-four foot column of water - 3.4 feet. So he constructed this new contraption, and that's exactly what happened.

He seemed to have demonstrated that air had weight. He had yet to demonstrate that there was a limited "sea of air" above the Earth. If that was true, then, he figured, the higher above the surface of the Earth he got, the closer to the surface of the "sea of air" would he be - thus there would be less air pushing down on him, and it wouldn't be able to support so high a column of mercury in his new instrument: the mercury column in his barometer should fall - say, if he took it up on top of a mountain. So he took it up on top of a mountain, and that's exactly what happened. And at various different altitudes the mercury column rose and fell appropriately.

Thus Torricelli was able to extrapolate from his barometer readings and figure out just how high above the surface of the Earth was the surface of the "sea of air". And beyond that point, it would seem, there was nothing - or at least nothing with any

weight. - An idea which, now that Torricelli had discovered that air did have weight, was even more disturbing: 'If air, which we thought didn't have weight, does have weight, and it comes to an end, and is not pushed down on by anything else above it, then what in Heaven's name is going on?'

Disturbing. But Torricelli did not prove that there was a limited sea of air above the Earth, though he did make it seem a bit more likely. Nor have we proven it to this day, though it does now seem even more likely. The logic works like this - the logic that Torricelli was using: IF, as I imagine, there is a limited sea of air above the Earth, THEN my newfangled mercury barometer should rise to such and such a height, and the height should change according to the altitude of this barometer above the Earth. IF there is a sea of air, THEN the barometer should rise. Fine. But the converse does not follow. IF the barometer rises, that does not mean there's a sea of air. It might rise because of some other reason entirely unknown to us - maybe there is some unknown force pushing out from the center of the Earth, or maybe mercury is attracted to the stars, or to angels. - None of these ideas certainly were any crazier in Torricelli's day than his "sea of air" hypothesis - in fact, perhaps a bit less so.

And even today we cannot prove, and have not proven, that there is a limited atmosphere above the Earth, though we do conjecture as much and will proceed accordingly until and unless we find reason not to. We have bright photographs taken from spaceships returning from the moon which show our globe small and blue and beautiful with its thin little layer of air and white clouds swirling around it, but what we read into the photographs is dependent on myriad theories of optics and light, time-lapse and simultaneity, color theory and spectral presumptions. We today feel sure of what we see because these theories are at the accustomed basis of our current physical knowledge, but they would have flabbergasted Torricelli and his fellow renaissance-men, and there's every reason to expect that they will seem as quaint and even childish to the common man in a few hundred years as the old idea that there was air in outer space now seems to us... - or that the Earth was at the center of the universe.

The old view of the scientific method as being one in which the scientist slowly and carefully gathers many small facts, little pieces of information, and then slowly puts them together until he builds up a general picture of principles, rules and general theories which tell us about what really is, is giving way in modern studies of the philosophy of science to the view that what the scientist does is make conjectures - guesses, theories and hypotheses - often as wild or wilder than Torricelli's was, and then start searching for facts that would refute or fail to

refute these conjectures. There is an increasing recognition that the nature of all scientific knowledge - even the knowledge that the Earth is a sphere - is only hypothetical in nature, that it cannot by its very nature ever be sure, but rather consist only of the best theories we've got so far, the ones no one has yet refuted, and thus that proof belongs only to the mathematician and logician - that what all the other scientists have is rather an endless process of conjecture and refutation which will then be followed by more conjecture and more refutation.

If the notion that the sciences deal not in certainties but rather in the continuing discovery of uncertainties and incredible mysteries seems hard to take very seriously, a look at the history of any science should serve to demonstrate - for example the history of astronomy as was beautifully outlined in a recent National Geographic... - not that the history of biology or criticism or historiography would show any more stability. It progresses from the ancient Egyptians (to take a random starting point) who believed the sky and the universe to be the body of a Sun-swallowing goddess, to the Ptolemaic view of concentric crystal spheres with the Earth at the center and a planet on each sphere - the spheres themselves rubbing together and making strange music (so they thought in the middle ages), to the Copernican view of a universe with the Sun at the center and the planets, including the Earth, swirling around it and all enclosed by the fixed sphere which had the stars on it, to the more recent view that there are millions of suns, our own being only one insignificant one, which compose the physical universe in one giant galaxy, and then the discovery that there were millions of galaxies of varying shapes and types, and then Einstein's unmentionable conclusions that the very light and distance and time with which we had been measuring all these objects were themselves unstable and, after all, only relative. - And the great modern diffraction of visible and invisible light rays which has produced in the past ten years the discovery of black holes in space where time probably goes backwards, of pulsars and quasars and neutron stars that blink on and off - the furthest we've seen so far being ten billion light years away and thus ten billion years ago - - - we think. Heaven knows what our physical heaven will be fifty years from now.

It is all conjectures: miraculous, vivid, strong and very consequential conjectures, conjectures we live by, with which we govern our private and social lives, but conjectures - in an endless etcetera of uncertain miracle and mystery. Perhaps

it's time for a few clichés:

- "Mankind cannot bear very much reality" said St. Thomas á Beckett in Eliot's play.
- "- but man, ... man was made to serve God wittily in the tangle of his mind" said Sir Thomas More in Bolt's play.
- "Mankind was not made for safe havens" said John F. Kennedy.

Such good clichés serve the valuable function of allowing us at least to stop thinking when it is, for the time being, useless to go on conjecturing, and to get back to more immediate dangers than the demise of Cygnus X-l or the frailties of the human machine.

Nobody knows how the human mind has ideas. Scientists freely admit that they cannot explain any logical progression of thoughts which lead them to the ideas or brain-storms or theories - even the simplest theories - which stand up to all attempts to refute them. The history of science is full of ridiculous statements from the most technical scientists about little voices in the ear and accidental observations and irresponsible hunches. Torricelli's hunch about a sea of air may seem rather pedestrian to us in the privilege of our hindsight, but our hindsights are always the advantage we can take for granted, and Torricelli was considered a bit mad in his home town.

One cannot decide to have a brilliant idea, or to be great. No one knows how it happens. Being young and healthy isn't enough, nor being old and wise. Even being young and wise isn't enough, or being old and healthy. And for that matter, being great probably isn't enough either. And asking "What <u>is</u> enough?" must certainly be a false question capable of stifling even the most vigorous contemplation.

The creative capacity of the mind to have ideas, and not just ideas but <u>good</u> ideas which lead us to discover previously unknown things about the physical world around us and (in the case of poets) the emotional world within us - this creative capacity is still one of the most astoundingly mysterious gifts we find ourselves with. One modern philosopher of science, when addressing himself to this phenomenon about five years ago, came to a refreshed conviction of an old-fashioned view on the subject. His name is Sir Peter Brian Medawar, a Lebanese-born Englishman. In 1960 he was awarded the Nobel Prize for Medicine for his work on growth, aging, immunity, and cellular transformations. After 1960 he became increasingly involved in the analysis of scientific method - interested in the true nature of the process of creative thinking which he himself had experienced so well. In one of his books on the subject, which he called <u>Induction and Intuition</u>

in Scientific Thought, after examining closely the history and logic of the methods scientists, as well as some other creative thinkers, use, - after all of his technical examinations, he comes up with the following statement:

- that 'creativity', or the having of good ideas, "cannot be learned perhaps, but it can certainly be encouraged and abetted. We can put ourselves in the way of having ideas, by reading and discussion and by acquiring the habit of reflection, guided by the familiar principle that we are not likely to find answers to questions not yet formulated in the mind."

'We can put ourselves in the way of having ideas.' This is the tradition which for the past years of your education has been given to you, and, if I may be allowed a little chauvinistic judgment and comparison, at A.C.S. it has been given to you in a fairly energetic and life-affirming way.

Not that you will necessarily be happier for the fact that you have been put in the way of having ideas which you didn't know you wanted, but you will probably be at least of more consequence than if you hadn't had it. You will now certainly have more strength to deal with the fact that the world is always falling down around our ears, the fact that 'all things fall and are built again', the fact which the old Greek Heraclitus expressed when he observed that all things, always, are in flux, constantly changing whether we perceive the change or not.

It takes no great effort to be reminded of this. Down at the bottom of the hill just to our north, the old quarter of Ain el Mreisse, the last residential section of Beirut which is directly on the sea-side with its triple-arched houses and red-tile roofs and mossy green shoals, is being sledge-hammered and bulldozed into the sea even as we are sitting here to make room for a super highway. And anti-personnel bombs were shooting sharp steel pellets through the trees fifty miles to the south of us only last night, and are probably doing so again this morning - even as we sit here. For as long as we have histories of men we have histories of kings struggling failure-laden out of view, of tragedies in love, of well-meaning pride demolished and taking its bearers with it. The Bible is not the only book to claim that there will always be wars and rumors of wars. And the Sun is burning out and the universe may be a big bang. The oil is running out and the population has already exploded. World-wide famine is thought likely by the time you're forty-five and the prophets of doom sound as viable as they did in Shakespeare's England, in Danté's Italy, in Plato's Greece, in Imhotep's

Egypt and in Rama's India. - Only, as far as we can tell, even more so. But there is surely something irrelevant in all of this for us. - So we live in a world at random which we cannot live in spite of, yet joy, when it happens, is still as pure, achievement still as fascinating, and variety and strangeness still as beautiful. It may be, for that matter, that having lived in Ras Beirut with its complex national mixture, so close to war and national insecurity, to the collision of old-world life-styles and monstrous traffic jams and commercialism, and so close to the visual collage of strong sea and sudden mountains, we have had an experience which may make the more contained and uniform countries we may have had our roots in seem provincial and narrow-minded when we return to them. It is a complaint which most A.C.S. teachers have heard at one time or another from old students returning for a visit - perhaps a facile complaint, but rarely without some cause somewhere. It is doubtful that there is anyone here who has not felt to some degree the peculiar dilemma of the expatriate - on the one hand the recognition that we are freer in the exploration of social variety and comparison of assumed values with those of other cultures and that the world is growing smaller and apparently will have to come together well or not at all, and on the other hand recognition that without some definite cultural identity, some definiteness of values which is in the blood, it is hard to react happily in any world - like the poor bat in Aesop's fable who, being neither bird nor beast, did not have to join either side when they decided to go to war against each other, but was also excluded from the celebrations each side held when they decided to call off the war and opt for peace.

Well, clearly, such is not our dilemma today. Your celebration, and ours, has come, and definitely. We are Americans and Lebanese, Saudi and Swede, and others and mixtures of these all here with something common in mind. We're all mixtures anyway, and nationalism, though undeniably of consequence, is still one of the shorter-term accidents of any-one's history. Our celebration has come, and it quite simply and effortlessly transcends differences which are not important and honors all those mysteries which are. We don't fully understand what it is we're celebrating, so ceremony allows us to express even that.

And as for what we do understand: congratulations.
May new joy wait on you. It's all out there waiting for you. It really is.
Congratulations - to you, and to us all.

NOTES

It is not fitting to include in an oral address such as this anything approaching the full acknowledgement of sources, quotes, theories and approaches which would be included in an academic paper. Nor is there anything wrong in not doing so. It is clearly not the presumption of this speech that the progression and development of ideas in the community of thought succeeds through a sequence of self-sufficient and highly original thought, nor that there is necessarily any such thing. Following, for those interested, is an outline of most of the known sources of material used in this address. (The phrase "known sources", I am reminded by a student, comes from T.S. Eliot's introduction to his notes for his long poem "The Wasteland".)

In General

The idea of talking about ceremony at a commencement ceremony comes from the American poet Richard Wilbur who, in a commencement address given at Washington University in St. Louis, addressed himself entirely to the subject, talking about (among other things) the natural and healthy functions of ceremony, as well as its inevitability; - also from one of Wilbur's early poems, "Ceremony", which contains the lines: "But ceremony never did conceal / (Save to the silly eye, which all allows) / How much we are the woods we wander in."

The idea of emphasizing that academic degrees and diplomas are genuinely hard-won awards is taken from a sermon delivered by Dr. W. B. Blakemore, Jr. (father of the speaker) of the University of Chicago at the university's Rockefeller Chapel on the last Sunday before one of the university's graduation ceremonies.

The approach to scientific knowledge which concludes that science is only a matter of continual conjecture and refutation, and not at all a matter of absolute fact and proof, finds its chief contemporary proponent in the German-English philosopher, Sir Karl Popper. Various ramifications of this point of view which are mentioned in this speech come from the American professor Edward Madden and the Lebanese-born Englishman, Sir Peter Medawar. Shortcomings of this approach are not mentioned in this speech.

commencement address notes - 2

Page One

First paragraph:

The idea that ACS high-school students didn't ask for the education they're getting but that "in general they think it's probably a good idea" is quoted directly from Mrs. Isobel Shechner, Chairman of the English Department at ACS, in a conversation.

Second paragraph:

The expressions in the second half of this paragraph bear conscious echoes of T.S. Eliot's lines about April being the cruelest month, "mixing memory with desire", and to ideas about cycles in history and culture expressed by James Joyce, most specifically in Finnegan's Wake.

Page Two

Third paragraph:

The statement that it is "the ultimate purpose of every teacher to make himself unnecessary" is a direct quote from Thomas T. Tashiro when he was a professor at Wesleyan University in Connecticut, in n conversation.

The observation that students probably learn more from their peers than from their teachers was passed on to the speaker by Dr. Blakemore in a conversation.

Page Three

Top paragraph:

Proper appreciation of the aphorism that 'truth is stranger than fiction' was emphasized by Professor Tashiro.

The phrase "the best theories we've got so far" is a near-quote of Karl Popper.

Second paragraph:

The observation that proof belongs only to the realms of mathematics and formal logic was made by Karl Popper, as was the observation that it should seem more likely to scientists that events will not happen in the way they have before.

Third paragraph:

The use of the case of Torricelli to demonstrate some of the basic logic of the scientific method was made by Professor Edward Madden in a lecture delivered to the senior class of ACS during the academic year 1968/69, and also in the introduction to his textbook on problems in the philosophy of science.

Page Five

Third paragraph:

“Small and blue and beautiful” is an exact quote from a poem by the American poet James Dickie written to celebrate the return to Earth of the crew of Apollo Eight, and the photographs they brought with them, after they had made the first manned flight to the region of the Moon.

Fourth paragraph:

The summary in the first sentence of this paragraph of the shift of thinking in modern philosophers of science is a near-quote of Professor David Makinson, Chairman of the Philosophy Department at the American University of Beirut, in a conversation.

Page Six

Top paragraph:

“Conjecture and refutation” is Karl Popper's phrase, as well as the title of one of his major books.

Second paragraph:

The National Geographic referred to is that of May, 1974.

Page Seven

Top paragraph:

The Eliot play is “Murder in the Cathedral”.
The Bolt play is “A Man For All Seasons”. The significance of the quote was emphasized to the speaker by his former ACS student, Rodion Rathbone.
The JFK quote is from an article written about the president’s mother some time after JFK’s assassination, in which it was observed that Mrs. Kennedy had a plaque bearing this quote on her mantelpiece.

Third paragraph:

This observation about the multitude of odd stories from scientists about how their good ideas came to then is made by Medawar in Induction and Intuition in Scientific Thought.

(The idea that Torricelli was thought a bit mad in his home town is the invention of the speaker – though it may certainly be true.)

Fifth paragraph:

"To have ideas, and not just ideas but good ideas" is a near-quote from the writings of both Karl Popper and, more closely, Peter Medawar.

The fourth sentence of this paragraph is an almost exact quote from the forward of Induction and Intuition in Scientific Thought.

Page Eight

Third paragraph:

"All things fall and are built again" is a line in Yeats' poem, "Lapis Lazuli".

Fourth paragraph:

The description of the effects of these anti-personnel bombs is a near-quote of John K. Cooley, radio correspondent for The American Broadcasting Company and Middle East correspondent for The Christian Science Monitor.

Page Nine

Top paragraph:

"We live in a world at random / Which we cannot live in spite of," is an exact quote from a poem by the speaker for his parents from Calcutta, December, 1971.

"Strong sea" is an exact quote from the American poet John Berryman's "Dream Song #1" which ends with the lines "Hard on the land wears the strong sea / And empty grows every bed."

"Kings struggling failure-laden out of view" (correction: on p.8) is an exact quote of a phrase in a poem written by student poet Sam Davis when he was at Wesleyan University, Connecticut.

Last paragraph:

"New joy wait on you" is an exact quote from Shakespeare's Pericles, Prince of Tyre - the song at the end of the play. The phrase was given especial importance in a production of the play put en in The Temple of Bacchus during the Baalbeck Festival of 1973; the phrase was used as the refrain of a song which the cast sang to the audience at the close of the play.
