

**FIRST LADY HILLARY RODHAM CLINTON
NOBEL PRIZE WINNERS RECEPTION
THE WHITE HOUSE
NOVEMBER 28, 1994**

TALKING POINTS

[Acknowledgments: Laura D'Andrea Tyson; John Gibbons; Harold Varmus; Ambassador and Mrs. Liljegren (pronounced Lill-ya-grin)]

I'd like to welcome all of you to the White House for this tribute to our 1994 American Nobel Prize winners. They are extraordinary individuals whose patient research and scholarship in all fields of science have contributed much to our understanding of the human experience and the human condition.

When this year's winners were announced, a friend of mine said, "I don't know what game theory is, but it sure sounds like fun."

I'm reminded of this because, for lay people like me who, to this day, remember with dread their 10th grade science class, it's quite humbling to be in a room filled with some of our greatest scientific minds.

Every so often, my daughter's teachers tell me that she has a natural aptitude for math. And each time they tell me, I assure them that she didn't get it from me.

So you know I mean it when I tell you that I have a special appreciation and admiration for the kind of work you do -- and the level at which you do it.

On behalf of the President, let me thank you for your contributions to science, to progress, and to humanity -- and let me thank you also for being an inspiration to young people like my daughter who, through your accomplishments, come to understand the critical role science plays in helping move our civilization forward.

[Introduce the vice-president]

FIRST LADY HILLARY RODHAM CLINTON
HOLLYWOOD WOMEN'S POLITICAL COMMITTEE
BEVERLY HILLS, CA
OCTOBER 28, 1994

TRANSCRIPT

Whoopi Goldberg: [Introduction]

(Applause)

First Lady: That was a most amazing introduction and I loved it. I just loved it. Thank you so much.

Whoopi Goldberg: You're welcome.

First Lady: Thanks. (Applause) Thank you. (Applause) Thank you all. Thank you so much.

Gee, I would've travelled forty hours instead of twenty to get here, to hear Chaka sing and hear Barbra talk about what's important and what's been accomplished and to hear me called 'very cool' by the high priestess of cool. I mean this is a great welcome home. (Applause)

I also am so pleased to be here with so many women and men whom I respect and admire and have become friends with and I'm so grateful for all of you supporting the work that has gone on for the last ten years by the Hollywood Women's Political Caucus, Committee. I am tired today.

Because without that work and without that commitment, a lot of very good candidates would not have been elected. And the people who are being supported this year need it more than ever in order to combat the misinformation and the propaganda and to get the message out.

I really believe that we are now ten days from an election where many candidates who were written off, were considered long shots are moving, and moving quickly to close the gap with their better financed opponents. And it is really a question of our momentum versus their money. And I believe that momentum is on the side of candidates like Kathleen Brown. And if she gets the resources to get her message out, she will win on November 8th. And that will be in large measure to many of you in this room.

And the same is true for Dianne, who has waged an extraordinary campaign based on accomplishments, based on a vision for the future, and she deserves to be reelected to the United States Senate and will be with your help. (Applause)

You know, on Wednesday, I was in Jordan for the peace signing and I was in a place called the Great Rift Valley and I was there, and perhaps some of you have stood across from Acaba

and looked at Jordan, and I was so struck by what had been accomplished because both brave leadership and the yearnings for peace in the hearts of Jordanians and Israelis had made it happen.

But as I sat through the ceremony, occasionally, my thoughts would return back home, because I thought over and over about the challenges that afflict any society, the challenges that have to be met in order for the future to be realized. Thankfully, we have not suffered the way those in the Middle East have who have worked tirelessly against great odds, both to defend themselves and to achieve peace.

But we have our own struggles and challenges and we also have to have a vision about what kind of country we want to be and what kind of energy we are willing to put into realizing that vision. And certainly, elections help to join the issues, to make clear what the choices are. And this year, perhaps more starkly than at other times in the recent past, we have a very clear choice in election after election around our country. We have the choice to yield to the forces of fear and negativism, cynicism and those who wish to take us back. If we listen to that Siren song that calls out and says things can be so much better, they can be so much easier if we just pull back. If we disenfranchise people in effect, if we pick out some enemies amongst us and turn our hatred toward them, then the rest of us will somehow feel better.

This is not a new Siren song in American politics. In fact, it seems to come up every so often, usually at the end of an era. If you go back to the end of the era that World War I marked, you can see it. The world was changed dramatically and all of a sudden, the rise of insecurity and anxiety amongst people as to the direction that they and we would take resulted in the first red scare, the upsurge of the Ku Klux Klan, a decade of greed and anxiety and frenetic activity culminating in the great depression.

At the end of the Second World War we had something comparable when all of a sudden again, the world changed for the better, Nazism was defeated, but in its place we faced the threat of communism. And again there was insecurity and anxiety and we found ourselves with McCarthyism, we found a resurgence of racism. We saw all of that and we had to work it through our political system.

Well now we are at the end of the Cold War, and because we are at the end of that era, the way people order their thinking has been challenged. We used to do everything in our political system in relation to our struggle against the Soviets. We educated our children after Sputnik by putting more money into classrooms and curriculums so that we could say we would be competitive. Everything we did had a touchstone that in some way related to that global struggle. That is no longer the defining

way we think about our world. And we have to begin to rebuild, not only how we see the world, but how we see ourselves. That, I think, accounts for much of the insecurity, the fear, and the unfortun -- merchanting of hate that Barbra referred to.

But it's important for us to recognize that that is an issue we have to understand and contend with because the legitimate concerns of people, who themselves feel that they're not making their way in our society, are being manipulated and used by those who are truly trying to take advantage of the political system and the citizens of this country for their own personal power and financial advantage.

So then how do we think about the upcoming election? I think we have to recognize that there is often more at stake than just who we vote for, because the candidates themselves symbolize something bigger than who they are individually. We saw that clearly when all of the Republicans lined up in support of the Contract For America. It was really that Siren song again -- turn back the clock, go back to the 1980's, drive up the deficit, write a trillion dollars worth of hot checks, take no responsibility and try to make people feel good while you essentially do what you can to promote your own political agenda.

That Contract For America included specific items such as the reinstitution of the gag rule, but in addition to that, it is a cynical document that tries to pull the wool over the eyes of the American public. But we saw a lot of that in the past several months. We saw legislation after legislation blocked or obstructed, not on the merits, but in a desire to prevent any kind of political progress from being made.

In the last days of the Senate, as Senator Boxer can attest to, who is here with us today, there were at times four different filibusters going on by the Republican minority in an attempt to prevent the passage of legislation.

My particular favorite was the filibuster of the Superfund legislation, a bill that had the combined support of big business, including the chemical companies, the labor unions, and the Sierra Club. Never before has those three ever agreed on any piece of legislation. But instead of trying to work together to do something about the poison in the ground, the Republican Senators filibustered that because they would rather spread the poison of political pollution than deal with the problems that the Superfund was designed solve.

There was a lot of that kind of cynical obstructionism. But there is an alternative and that is the message that I think is finally breaking through. Because you cannot continue to tell people that the clock can be turned back when they know better. What we have, instead, is an opportunity to continue to build on the work that has already been accomplished in the last twenty months.

We have seen progress in the economy. It hasn't touched everyone, but it is beginning to. We have seen the passage of significant legislation. 20 million more young Americans will be able to go to college than could this time last year. We have seen the beginning of the AmeriCorps experiment with 20,000 young Americans giving service to their communities. We've seen now the funding for 800,000 more youngsters to go into Head Start, 5 million more women to get nutritional supplements through the WIC program, every child to be immunized regardless of their parent's financial or insurance status, and we have seen an education package that will guarantee high standards in our schools and also opportunities for young people who do not go on to college. All of that has been passed and now is being implemented.

There were things we did not get. (Applause) There were things that we were not successful in achieving because it was a very ambitious agenda trying to push on many fronts that had either been neglected or denied in the past. We did not get comprehensive health care reform, but we will get it because it is the right thing to do for the people of our country. (Applause)

But we did make progress in funding health research, particularly on issues affecting women. It was about time that the Institutes of Health that are funded by the federal government gave their attention to breast cancer, ovarian cancer, osteoporosis, and other diseases that affect women. (Applause)

And we knew from the very beginning of the administration when the President signed the repeal of the gag rule that this President and administration is committed to a woman's right to choose and will stand firmly for it. (Applause)

And we know that comprehensive health care reform means expanding family planning, it means providing access to the kinds of facilities that those of us in this room take for granted to all of our citizens. And it means signing the Freedom of Access to Clinics Entrance Act to try to prevent the kind of violence that too often has interfered with women's right to choose.

But we haven't just moved forward on what we knew was already necessary to be done. We've also talked with women about what they wanted done. In an unprecedented outreach effort, this administration asked more than 250,000 women to fill out surveys about their lives. And some of you in this room helped with that project and we are very grateful. Because what we heard is that women who are there in the workforce, outside the home, they want what all of us want, they want respect, they want equal pay for the work they do, they want some opportunity to balance their work and family responsibilities and they don't think they are getting any of that now.

And this administration is committed to a broad agenda to help women realize their full potential whether they choose to

remain at home or whether they choose to go into the workforce or whether like most of us they are in the middle of the balancing act that we all are engaged in. (Applause)

Part of what is at stake in this election, although I doubt that anyone would ever come right out and say it on the other side, is that by turning back the clock, by going back to the political policies that are promoted in the Contract For America, they are really trying to limit women's potential. They are really trying to say that there are certain roles and activities that are appropriate for women and should be supported and there are others which are not. And I think we need to say through the support of the candidates like those in this room, women are not going to buy that. We want to be whomever we choose to be, that's what we are fighting for in our political system. (Applause)

You know, when we announced the results of the survey that I just referred to and published the study called Women Count, we had three women speak from their own personal experiences. One was a woman who had gone into the workforce late in life and talked about how much she enjoyed working and how important it was for her to work because she was the one who provided health insurance for her family. Another woman spoke about how difficult it was to go home at the end of the day and take care of her children's needs, particularly to help with homework, to listen, to be there for them. And the third woman who had been in a non-traditional job and had raised three daughters as a single mother said all she really wanted was the chance to compete for promotion and for the kind of opportunities on the job that she thought she deserved to have.

As I listened to those three women, I knew that I had been every place they were. I knew that those kinds of feelings, those conflicts, that guilt, that excitement, that challenge were all part of what it means to be a woman today. And I stood there as I made the closing remarks and said that for all of my life, ever since I started with part-time jobs, I had known how difficult it would be to do what I wanted to do. In my early years, there was always some boy telling me I shouldn't do what I was doing. And as I got older, there was always some man around who said the same thing. But I never felt that they knew what they were talking about and I don't think that (Applause) I don't think that we ought to support candidates who either explicitly or implicitly try to say to little girls or to those of us who are grown ups, we know what's best for you and we will make the decisions for you. (Applause)

Now one of the ways to avoid that is to do what the President has been doing with the appointments he's been making. He has appointed some of the most qualified people ever to sit on the federal bench. And the biggest majority of women and people of color that have ever been put on the bench and they are getting high quality marks. Because there isn't any conflict between filling important positions and finding qualified women

and qualified minorities if you're willing to work at doing it right. And this President gets up every day thinking that he was elected to represent the entire country and that is what he will continue to do to give women opportunities to exercise real power. (Applause)

Nearly all those thoughts went through my mind as I was sitting at that signing on Wednesday. (Laughter) Partly, because I have to tell you, that it also was my birthday which has now been celebrated in four countries and in ten time zones. There is absolutely no escaping your age when you're in this position. That is one of the downsides. But I did think of many of these issues as I helped to celebrate such an extraordinary accomplishment halfway across the world. And it made me very proud of America.

The ceremony was started when the Jordanian band played the Jordanian anthem, then the Israeli band played the Israeli anthem, and then they joined together to play our anthem. And in our group of people who went to that signing, there were Arab Americans, Jewish Americans, Christian Americans of every denomination, all there representing what is best about America. All there committed to a better future, not a reactionary past. And I was so proud to be an American. And I was so proud of our President for having both the head and the heart that it takes to try to solve difficult problems. (Applause) There aren't any problems in our country that cannot be solved by people of good faith working together. Yes, it takes patience, and it takes forbearance, and it sometimes takes biting your tongue, as the forces arrayed against you are attempting to confuse or distort.

But what you have done with your contributions is to make it possible for those who believe in a better future, who believe in practical, progressive problem-solving to join together to get their message out. And I'm very grateful for that. Because I happen to believe that we're going to do quite well in these elections if we really stay focused between now and November 8. Because what you are standing for and what we are working for makes more sense in the long run and if people can hear the truth, they will be informed voters and they will vote for candidates who promise a better future. That's what politics should be about. That's what I have just seen in an entirely different part of the world. And that's what I will keep working for here at home.

Thank you very much. (Applause)

FIRST LADY HILLARY RODHAM CLINTON
REMARKS TO AMERICANS IN JERUSALEM
JERUSALEM
OCTOBER 27, 1994

TRANSCRIPT

Shall I ask that Mrs. Rabin and Mrs. Weizman join me? They just have come in. (Applause) They wanted to be ordinary guests, but they are not ordinary guests (laughter) and I wanted all of you who are here today to join me in welcoming and thanking them, so I appreciate their joining me up here. (applause)

I must say I know there's just a little bit of municipal competition (laughter) when the Charge spoke on behalf of those from Tel Aviv and there was a little bit of a cheer in the front, but not knowing whether it was appropriate it kind of died. (laughter) And then when the Consul General spoke on behalf of his posting here in Jerusalem, a great (laughter) cry went up and... We ought to give the people who came all the way from Tel Aviv equal time for them (inaudible) (applause).

It is a remarkable time and I am so grateful for all of you who work on behalf of the American government here in the state of Israel and also grateful to more than the 50,000 Americans who live here and who contribute day in and day out to the strength and vitality of this country. (applause)

Because we know that with the signing of a peace treaty as we all witnessed yesterday that the real work is just beginning. That may sound a little bit daunting, because it took so much effort and such great leadership to reach the point that was reached yesterday. But the peace can only be built by the literally thousands of daily decisions that are taken by the citizens of Israel and Jordan.

And it is to that daily effort that the United States will be and is committed to. Because we want to do all we can to support the normalcy of peace, to make peace be something that we can, hopefully, take for granted at some point in the future. And yet as the president has said repeatedly, we know we must remain vigilant against extremism, against terrorism.

As he told the Jordanian Parliament last night, we must stand against those who would attempt to undo and undermine the efforts of the majority of people of goodwill in both countries and throughout the region who are attempting to put the past behind them. And it is to that constant struggle and challenge that we pay homage and tribute today.

As I mentioned earlier in the luncheon that Mrs. Weizman and Mrs. Rabin hosted for me, my husband and I have been privileged to be tourists in Israel years ago, and we came away with such a strong, vital impression of the people of this great country, of its legacy and its future and are so committed to doing all we that we can, certainly personally and he can, in an official capacity, to realize the promise of the state of Israel, in the lives of the citizens today and the children and grandchildren yet to come.

So it is a particularly poignant and moving moment for all of us and I am so pleased to be able to share it with my fellow Americans. And to thank all of you for what you have done day in and day out to build toward yesterday, but more importantly to build for tomorrow. We are grateful to you and we want to extend not only our partnership and friendship, but our commitment that we will walk this road together.

Thank you very much.

since I cannot have the happiness of knowing what will be known a hundred years hence.

BENJAMIN FRANKLIN (1706–90), U.S. statesman, writer. Letter, 27 July 1783, to naturalist Sir Joseph Banks, President of the Royal Society (published in *Complete Works*, vol. 8, ed. by John Bigelow, 1887–88).

19 The pace of science forces the pace of technique. Theoretical physics forces atomic energy on us; the successful production of the fission bomb forces upon us the manufacture of the hydrogen bomb. We do not choose our problems, we do not choose our products; we are pushed, we are forced—by what? By a system which has no purpose and goal transcending it, and which makes man its appendix.

ERICH FROMM (1900–1980), U.S. psychologist. *The Sane Society*, ch. 5, "Nineteenth-Century Capitalism" (1955).

20 The real accomplishment of modern science and technology consists in taking ordinary men, informing them narrowly and deeply and then, through appropriate organization, arranging to have their knowledge combined with that of other specialized but equally ordinary men. This dispenses with the need for genius. The resulting performance, though less inspiring, is far more predictable.

JOHN KENNETH GALBRAITH (b. 1908), U.S. economist. *The New Industrial State*, ch. 6 (1967).

21 Science is analytical, descriptive, informative. Man does not live by bread alone, but by science he attempts to do so. Hence the deadliness of all that is purely scientific.

ERIC GILL (1882–1940), British sculptor, engraver, writer and typographer. *Essays*, "Art" (1948).

22 Science is the only truth and it is the great lie. It knows nothing, and people think it knows everything. It is misrepresented. People think that science is electricity, automobilism, and dirigible balloons. It is something very different. It is life devouring itself. It is the sensibility transformed into intelligence. It is the need to know stifling the need to live. It is the genius of knowledge vivisectioning the vital genius.

RÉMY DE GOURMONT (1858–1915), French critic, novelist. "Art and Science," in *Promenades Philosophiques* (1905–9; repr. in *Selected Writings*, ed./tr. by Glen S. Burne, 1966).

23 Since we are assured that the all-wise Creator has observed the most exact proportions of number, weight and measure in the make of all things, the most likely way therefore to get any insight into the nature of those parts of the Creation which come within our observation must in all reason be to number, weigh and measure.

STEPHEN HALES (1677–1761), English scientist. *Vegetable Statics*, Introduction (1727). The work followed his own precepts of scrupulous scholarship, containing exact details of the weighing, measuring and recording he carried out in his experiments on plants.

24 Science, which cuts its way through the muddy pond of daily life without mingling with it, casts its wealth to right and left, but the puny boatmen do not know how to fish for it.

ALEXANDER HERZEN (1812–70), Russian journalist, political

thinker. *My Past and Thoughts*, vol. 3, pt. 8, "Miscellaneous Pieces: Swiss Views" (1921; tr. by Constance Garnett, 1924–27).

25 Science is the knowledge of consequences, and dependence of one fact upon another.

THOMAS HOBBES (1588–1679), English philosopher. *Leviathan*, pt. 1, ch. 5 (1651).

26 To overturn orthodoxy is no easier in science than in philosophy, religion, economics, or any of the other disciplines through which we try to comprehend the world and the society in which we live.

RUTH HUBBARD (b. 1924), U.S. biologist. "Have Only Men Evolved?" in *Women Look at Biology Looking At Women* (ed. by Ruth Hubbard, Mary Sue Henifin and Barbara Fried, 1979).

27 Science has "explained" nothing; the more we know the more fantastic the world becomes and the profounder the surrounding darkness.

ALDOUS HUXLEY (1894–1963), British author. *Along the Road*, pt. 2, "Views of Holland" (1925).

28 Man lives for science as well as bread.

WILLIAM JAMES (1842–1910), U.S. psychologist, philosopher. *Vivisection*, (1875; repr. in "The Works of William James," vol. 17, pt. 1, 1987).

29 Nevertheless, in order to imbue civilization with sound principles and enliven it with the spirit of the gospel, it is not enough to be illumined with the gift of faith and enkindled with the desire of forwarding a good cause. For this end it is necessary to take an active part in the various organizations and influence them from within. And since our present age is one of outstanding scientific and technical progress and excellence, one will not be able to enter these organizations and work effectively from within unless he is scientifically competent, technically capable and skilled in the practice of his own profession.

POPE JOHN XXIII (1881–1963). Encyclical, 10 April 1963 (published in *Pacem in Terris*, pt. 5).

30 In everything that relates to science, I am a whole Encyclopaedia behind the rest of the world.

CHARLES LAMB (1775–1834), English essayist, critic. *The Essays of Elia*, "The Old and the New Schoolmaster" (1820–23).

31 Science is all metaphor.

TIMOTHY LEARY (b. 1920), U.S. psychologist. Interview, 24 Sept. 1980, published in *Contemporary Authors*, vol. 107, Metaphor.

32 The scientific mind does not so much provide the right answers as ask the right questions.

CLAUDE LÉVI-STRAUSS (b. 1908), French anthropologist. *The Raw and the Cooked*, "Overture," sect. 1 (1964).

33 When we say "science" we can either mean any manipulation of the inventive and organizing power of the human intellect: or we can mean such an extremely different thing as the religion of science, the vulgarized derivative from this pure activity manipulated by a sort of priestcraft into a great religious and political weapon.

WYNDHAM LEWIS (1882–1957), British author, painter. *The Art of Being Ruled*, "Revolution and Progress," ch. 1 (1926).

34 The most heated defenders of a science, who can-

not endure the slightest sneer at it, are commonly those who have not made very much progress in it and are secretly aware of this defect.

G. C. LICHTENBERG (1742–99), German physicist, philosopher. *Aphorisms*, "Notebook F," aph. 8 (written 1765–99; tr. by R. J. Hollingdale, 1990).

35 There is no greater impediment to progress in the sciences than the desire to see it take place too quickly.

G. C. LICHTENBERG (1742–99), German physicist, philosopher. *Aphorisms*, "Notebook K," aph. 72 (written 1765–99; tr. by R. J. Hollingdale, 1990).

36 Natural science will in time incorporate into itself the science of man, just as the science of man will incorporate into itself natural science: there will be *one* science.

KARL MARX (1818–83), German political theorist, social philosopher. *Economic and Philosophic Manuscripts of 1844* (1844; repr. in *Karl Marx and Friedrich Engels: Collected Works*, vol. 3, 1975).

37 The product of mental labor—science—always stands far below its value, because the labor-time necessary to reproduce it has no relation at all to the labor-time required for its original production.

KARL MARX (1818–83), German political theorist, social philosopher. *Theories of Surplus Value*, vol. 1, Addendum, "Hobbes on Labor, on Value and on the Economic Role of Science" (1862–63).

38 From man or angel the great Architect
Did wisely to conceal, and not divulge
His secrets to be scanned by them who ought
Rather admire; or if they list to try
Conjecture, he his fabric of the heav'n's
Hath left to their disputes, perhaps to move
His laughter at their quaint opinions wide
Hereafter, when they come to model heav'n
And calculate the stars, how they will wield
The mighty frame, how build, unbuild, contrive
To save appearances, how gird the sphere
With centric and eccentric scribbled o'er,
Cycle and epicycle, orb in orb.

JOHN MILTON (1608–74), English poet. *The angel Raphael, in Paradise Lost*, bk. 8.

39 Oh, how much is today hidden by science! Oh, how much it is expected to hide!

FRIEDRICH NIETZSCHE (1844–1900), German philosopher. *The Genealogy of Morals*, essay 3, "What Do Ascetic Ideals Mean?" aph. 23 (1887).

40 There does not exist a category of science to which one can give the name applied science. There are science and the applications of science, bound together as the fruit of the tree which bears it.

LOUIS PASTEUR (1822–95), French chemist. "Pourquoi la France n'a pas trouvé d'hommes supérieurs au moment du péril," in *Revue Scientifique* (Paris, 1871).

41 Traditional scientific method has always been at the very best, 20–20 hindsight. It's good for seeing where you've been. It's good for testing the truth of what you think you know, but it can't tell you where you ought to go.

ROBERT M. PIRSIG (b. 1928), U.S. author. *Zen and the Art of Motorcycle Maintenance*, pt. 3, ch. 24 (1974).

42 If the study of all these sciences which we have enumerated, should ever bring us to their mutual association and relationship, and teach us the nature of the ties which bind them together, I believe that the diligent treatment of them will forward the objects which we have in view, and that the labor, which otherwise would be fruitless, will be well bestowed.

PLATO (c. 427–347 B.C.), Greek philosopher. Socrates, in *The Republic*, bk. 7, sect. 531.

43 One science only will one genius fit;
So vast is art, so narrow human wit.

ALEXANDER POPE (1688–1744), English satirical poet. *An Essay on Criticism*.

44 Science may be described as the art of systematic over-simplification.

KARL POPPER (b. 1902), Anglo-Austrian philosopher. Quoted in: *Observer* (London, 1 Aug. 1982).

45 It is sometimes important for science to know how to forget the things she is surest of.

JEAN ROSTAND (1894–1977), French biologist, writer. *Pensées d'un Biologiste* (1939; repr. in *The Substance of Man*, "A Biologist's Thoughts," ch. 7, 1962).

46 In science men have discovered an activity of the very highest value in which they are no longer, as in art, dependent for progress upon the appearance of continually greater genius, for in science the successors stand upon the shoulders of their predecessors; where one man of supreme genius has invented a method, a thousand lesser men can apply it.

BERTRAND RUSSELL (1872–1970), British philosopher, mathematician. *A Free Man's Worship and Other Essays*, ch. 3 (1976).

47 Science becomes dangerous only when it imagines that it has reached its goal.

GEORGE BERNARD SHAW (1856–1950), Anglo-Irish playwright, critic. *The Doctor's Dilemma*, Preface, "The Latest Theories" (1911).

48 Science is organized knowledge.

HERBERT SPENCER (1820–1903), English philosopher. *Education*, ch. 2 (1861).

49 True science investigates and brings to human perception such truths and such knowledge as the people of a given time and society consider most important. Art transmits these truths from the region of perception to the region of emotion.

LEO TOLSTOY (1828–1910), Russian novelist, philosopher. *What Is Art?* ch. 10 (1898; repr. in *Tolstoy on Art*, ed. by Aylmer Maude, 1924).

50 Science is a cemetery of dead ideas.

MIGUEL DE UNAMUNO (1864–1936), Spanish philosophical writer. *The Tragic Sense of Life*, ch. 5 (1913).

51 Science means simply the aggregate of all the recipes that are always successful. All the rest is literature.

PAUL VALÉRY (1871–1945), French poet, essayist. *Moralités* (1932; repr. in *Collected Works*, vol. 14, "Analects," ed. by J. Matthews, 1970).

52 To us, men of the West, a very strange thing happened at the turn of the century; without noticing it, we

ing that had been called by
nturies. What we now have
ifferent, radically different,
. Nobody knows what it is.
nch philosopher, mystic. "Classical
41; published in *On Science*,
d, ed. by Richard Rees, 1968).

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man life a little above the
me of the grace of tragedy.

, U.S. theoretical physicist. *The*
(197), closing sentence.

wonder—and so perhaps do
sending him to sleep again.

(189–1951), Austrian philosopher.
H. von Wright with Heikki Nyman,

Lamb on The COSMOS; ENGINEERING;
E. PHYSICS; Lichtenberg on PREACHING;
N. SCIENTISTS; The SOCIAL SCIENCES;

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al quackery.

(1959), U.S. author. *The Note-*
Great Thought" (1976).

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British critic. *The Unquiet Grave*,

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(1965), Jan. 1906 entry.

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Half-Truths and One-And-A Half-
iddles out of Solutions," ed. by

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(6).

n the variables are few and

can be enumerated; when their combinations are distinct
and clear. We are tending toward the condition of sci-
ence and aspiring to do it. The artist works out his own
formulas; the interest of science lies in the *art* of making
science.

PAUL VALÉRY (1871–1945), French poet, essayist. *Moralités*
(1932; repr. in *Collected Works*, vol. 14, "Analects," ed. by J.
Matthews, 1970).

SCIENCE AND NATURE

1 Whatever the scientists may say, if we take the
supernatural out of life, we leave only the unnatural.

AMELIA BARR (1831–1919), Anglo-American novelist. *All the*
Days of My Life, ch. 26 (1913).

2 Our ideas must be as broad as Nature if they are to
interpret Nature.

SIR ARTHUR CONAN DOYLE (1859–1930), English author.
Sherlock Holmes, in *A Study in Scarlet*, ch. 5 (1888).

3 Well: what we gain by science is, after all, sadness,
as the Preacher saith. The more we know of the laws &
nature of the Universe the more ghastly a business we
perceive it all to be—and the non-necessity of it.

THOMAS HARDY (1840–1928), English novelist, poet. Letter, 27
Feb. 1902 (published in *Collected Letters*, vol. 3, ed. by Richard
Little Purdy and Michael Millgate, 1982). Hardy's reference to
"the Preacher" is to *Ecclesiastes* 1:18. See Hebrew Bible on
KNOWLEDGE.

4 Every formula which expresses a law of nature is a
hymn of praise to God.

MARIA MITCHELL (1818–89), U.S. astronomer. Quoted as
inscription on her bust in the Hall of Fame (1905).

5 If we knew all the laws of Nature, we should need
only one fact, or the description of one actual phenom-
enon, to infer all the particular results at that point. Now we
know only a few laws, and our result is vitiated, not, of
course, by any confusion or irregularity in Nature, but by
our ignorance of essential elements in the calculation. Our
notions of law and harmony are commonly confined to
those instances which we detect; but the harmony which
results from a far greater number of seemingly conflicting,
but really concurring, laws, which we have not detected, is
still more wonderful. The particular laws are as our points
of view, as, to the traveler, a mountain outline varies with
every step, and it has an infinite number of profiles, though
absolutely but one form. Even when cleft or bored through
it is not comprehended in its entirety.

HENRY DAVID THOREAU (1817–62), U.S. philosopher, author,
naturalist. *Walden*, "The Pond in Winter" (1854).

SCIENCE AND SOCIETY

1 Dissent is the native activity of the scientist, and it
has got him into a good deal of trouble in the last years.
But if that is cut off, what is left will not be a scientist.
And I doubt whether it will be a man.

JACOB BRONOWSKI (1908–74), British scientist, author. "The
Sense of Human Dignity," lecture, 19 March 1953, the Massa-
chusetts Institute of Technology (published in Jacob Bronowski,
Science and Human Values, pt. 3, sect. 5, 1961).

2 No science is immune to the infection of politics
and the corruption of power.

JACOB BRONOWSKI (1908–74), British scientist, author.
Encounter (London, July 1971).

3 I hate Science. It denies a man's responsibility for
his own deeds, abolishes the brotherhood that springs
from God's fatherhood. It is a hectoring, dictating exper-
tise, which makes the least lovable of the Church Fathers
seem liberal by contrast. It is far easier for a Hitler or a
Stalin to find a mock-scientific excuse for persecution
than it was for Dominic to find a mock-Christian one.

BASIL BUNTING (1900–1985), British poet. Letter, 1 Jan. 1947,
to poet Louis Zukofsky. Quoted in: Victoria Forde, *The Poetry of*
Basil Bunting, ch. 6 (1991).

4 Science is an integral part of culture. It's not this
foreign thing, done by an arcane priesthood. It's one of
the glories of the human intellectual tradition.

STEPHEN JAY GOULD (b. 1941), U.S. scientist. *Independent*
(London, 24 Jan. 1990).

5 We are living now, not in the delicious intoxication
induced by the early successes of science, but in a rather
grisly morning-after, when it has become apparent that
what triumphant science has done hitherto is to improve
the means for achieving unimproved or actually deterio-
rated ends.

ALDOUS HUXLEY (1894–1963), British author. *Ends and Means*,
ch. 14 (1937).

6 We have genuflected before the god of science only
to find that it has given us the atomic bomb, producing
fears and anxieties that science can never mitigate.

MARTIN LUTHER KING, JR. (1929–68), U.S. clergyman, civil
rights leader. *Strength Through Love*, ch. 13 (1963).

7 The future of humanity is uncertain, even in the
most prosperous countries, and the quality of life deterio-
rates; and yet I believe that what is being discovered
about the infinitely large and infinitely small is sufficient
to absolve this end of the century and millennium. What
a very few are acquiring in knowledge of the physical
world will perhaps cause this period not to be judged as
a pure return of barbarism.

PRIMO LEVI (1919–87), Italian chemist, author. *Other People's*
Trades, "News from The Sky" (1985; tr. 1989).

8 The puritanical potentialities of science have never
been forecast. If it evolves a body of organized rites, and
is established as a religion, hierarchically organized, and
things more than anything else will be done in the name
of "decency." The coarse fumes of tobacco and liquors,
the consequent tainting of the breath and staining of
white fingers and teeth, which is so offensive to many
women, will be the first things attended to.

WYNDHAM LEWIS (1882–1957), British author, painter. *The Art*
of Being Ruled, "The Family and Feminism," ch. 7 (1926).

9 The negative cautions of science are never popular.
If the experimentalist would not commit himself, the
social philosopher, the preacher, and the pedagogue tried
the harder to give a short-cut answer.

MARGARET MEAD (1901–78), U.S. anthropologist. *Coming of*
Age in Samoa, ch. 1 (1928).

spirit and courage. So you're
come here. Your credentials to
the White House are second to
we are very glad to have you.

President spoke at 9:45 a.m. on the
at the White House. Among the guests
p of Congressional Medal of Honor
President of the Medal of Honor So-
Skaggs, Jr., officers of the D.C. Civil
ial Commission, and members of the
War Centennial Commission.

ister Macmillan, in Washington on a
is also present and spoke to the group
President's remarks.

With Prime Minister

en Great Britain and the Euro-
omic Community, and explained
nce of preserving the interests of
onwealth and EFTA countries.
nt and Prime Minister expressed
that these negotiations between
Kingdom and the EEC would be
ith success. The President in-
Prime Minister of the progress
for new trade legislation to per-
relationships within and beyond
Community.

ident and the Prime Minister
red the situation of the NATO
ne light of the forthcoming meet-
ns. They also discussed the sit-
outtheast Asia, and strongly reaf-
support for an independent and
ps under a government com-
hat objective. They discussed
mutual commercial interest, in-
itions of shipping policy, tariffs
dity problems. The President
e Prime Minister of the devel-
s of the Western Hemisphere
Alliance for Progress and ex-
concern for the maintenance
ment of adequate market op-
for the products of the Latin
untries.

John F. Kennedy, 1962

Apr. 29 [161]

161 Remarks at a Dinner Honoring Nobel Prize Winners of the Western Hemisphere. April 29, 1962

Ladies and gentlemen:

I want to welcome you to the White House. Mr. Lester Pearson informed me that a Canadian newspaperman said yesterday that this is the President's "Easter egg-head roll on the White House lawn." I want to deny that!

I want to tell you how welcome you are to the White House. I think this is the most extraordinary collection of talent, of human knowledge, that has ever been gathered together at the White House, with the possible exception of when Thomas Jefferson dined alone.

Someone once said that Thomas Jefferson was a gentleman of 32 who could calculate an eclipse, survey an estate, tie an artery, plan an edifice, try a cause, break a horse, and dance the minuet. Whatever he may have lacked, if he could have had his former colleague, Mr. Franklin, here we all would have been impressed.

In any case, I am delighted to welcome you here. We are delighted to have the Norwegian Ambassador and the Swedish Minister to represent their governments, and we are delighted to have the Nobel prize winners of the Western Hemisphere here at this dinner.

I know that the Nobel prize does not have any geographic or national implications. Mr. Nobel in his will, in fact, made it very clear when he said that he hoped that in the giving of the prize that no attention would be paid to nationality. He declared it to be "my express desire that in awarding the prize, no consideration whatsoever be paid to the nationality of the candidates; that is to say, the most deserving be awarded the prize, whether he or she be Scandinavian or not."

In any case, there is no nationality in the Nobel prize, just as there is no nationality in the acquisition of knowledge. I know that every man here who has won the Nobel

prize, not only does he build on the past, which goes back hundreds and thousands of years, on the efforts of other men and women, but he also builds on the efforts of those in other countries; and therefore, quite rightly, the Nobel prize has no national significance.

But I think we can take some satisfaction that this hemisphere has been able to develop an atmosphere which has permitted the happy pursuit of knowledge, and of peace; and that over 40 percent of the Nobel prizes in the last 30 years have gone to men and women in this hemisphere.

And of particular pleasure today is the fact that 13 Nobel prizes for peace have gone to those who live in this hemisphere. I think the pursuit of knowledge, the pursuit of peace, are very basic drives and pressures in this life of ours—and this dinner is an attempt, in a sense, to recognize those great efforts, to encourage young Americans and young people in this hemisphere to develop the same drive and deep desire for knowledge and peace.

So I want you to know that you are most welcome here. I regard this as the most distinguished and significant dinner that we have had in the White House since I have been here, and I think in many, many years.

And I hope that it will stimulate among all people, in this hemisphere and far beyond, the recognition of the close ties that bind all who labor to provide a better life for their people.

So I hope that you will join me in drinking to the Nobel prize winners of this year and other years—and perhaps more widely, to all those people everywhere whom they serve.

NOTE: The dinner was held in the State Dining Room and the Blue Room at the White House. Early in his remarks the President referred to Lester B. Pearson, Canada's Liberal Party leader, a Nobel

Funny Nobel anecdote -

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The Toronto Star

October 16, 1994, Sunday, FINAL EDITION

SECTION: SCIENCE; Pg. C8

LENGTH: 674 words

HEADLINE: The reason Nobel prizes differ from all others

BYLINE: JAY INGRAM

BODY:

A familiar chill ran through me this week when I read the list of this year's Nobel prize winners. A chill because for a science journalist the announcement of the Nobels is a frightening event. There is a heavy obligation to talk about them but unfortunately very little to say.

It's bizarre. Everybody knows about the prizes but nobody knows anything about what the winners did to win them. And in that, these are different from all other prizes we know.

Even the most casual moviegoer can get caught up in the excitement of Oscar night. And why not? All you have to do is see a few of the movies and you are in a position to judge the quality of the acting. You may or may not agree with the selections but at least you have an opinion.

CONSUMER FACTOR

Ask any hockey fan why Wayne Gretzky deserves to win the Hart Trophy and he or she can tell you. Ask a bibliophile about the Booker prize and you will get an answer. What sets these examples apart from the Nobel prizes is that we can participate in all of them. We are consumers of sports, movies and books. We can judge the product as it is put in front of us. Science is different.

So few people understand and follow cutting-edge science that participation in any sense is absent. As a result, interviewers and writers are forced to resort to the kind of coverage you might have heard or read this week. "Did you think you'd ever win the Nobel?" "What is it like being a Nobel prize winner?" "You must be thrilled." (No kidding). And then the question that fills both audience and interviewer with dread, but must nevertheless be asked: "Can you explain your work . . . in very simple, non-technical terms? Briefly?"

It was when I was host of CBC-Radio's Quirks and Quarks that I first developed the "Nobel chill." I felt silly condensing 20 or 30 years' work into a phrase like, "So-and-so won the prize for his work in determining the structure of the atom." At the same time, I knew that expanding the explanation into three paragraphs would have induced slow-wave sleep in our listeners.

The only really entertaining Nobel report I ever did on the radio was the year that UCLA researcher Donald Cram won the chemistry prize. When the Nobel committee placed their traditional early morning phone call, they reached the wrong person in Los Angeles. They woke Donald Cram the carpet cleaner and told him he had just won the Nobel prize for chemistry.

The Toronto Star, October 16, 1994

LIKABLE CHARACTER

Naturally we too called the carpet-cleaning Cram, who turned out to be a witty and likable character. When I asked him if there was anything he had done outstanding in his undergraduate days in chemistry, he replied that he had stood third in his class at USC, the only problem being that there had been only three people in the class. The one thing that marred this genuinely humorous piece of radio was my obligatory explanation of what the real Dr. Donald Cram had done to merit the Nobel.

I am not saying that science in this sort of depth can never be interesting. There are really two problems. One is that the work is outside our experience; we can't relate to it. The other is that the time necessary to provide us with the necessary background (so that we might grasp the significance of the prize-winning work) is far in excess of what is normally available in the media.

There is a rare opportunity coming Nov. 3 and 4 to hear Nobel laureates unconstrained by that media time frame. As part of the inauguration of the John C. Polanyi Chair in Chemistry at the University of Toronto, nine Nobel laureates will give public lectures at Convocation Hall on the U of T campus. The topics range from the details of molecular collisions to life in the cosmos. Just don't ask any of the laureates if winning the Nobel changed his life.

Somewhere between the fossil bed and my last column, archaeopteryx became archaeopterix. We still don't know if it could fly.

* Jay Ingram's new book, The Burning House, an investigation of the brain, is being published this month.

LANGUAGE: ENGLISH

LOAD-DATE-MDC: October 17, 1994

*Interesting
Nobel statistic -*

The Independent, October 16, 1994

bought and sold. Nobody can patent Newton's Law of Gravity or Heisenberg's Uncertainty Principle. Yet no engineer could build a bridge without knowing Newtonian dynamics, any more than today's "information superhighway" would be possible without understanding the quantum mechanics of how optical signals are transmitted along fibre optic cables.

Science is necessary for commerce and industry, but commerce and industry will not pay for it. Governments must. And in countries with conservative - but less ideological - governments, such as Germany, they do. To match Germany's spending on civil science, the British government would have to find an extra pounds 5.3bn a year. Simply to match the proportion of gross domestic product would require a further pounds 2.5bn a year.

Does it matter that we no longer produce Nobel prize-winners? After all, the Japanese have done rather nicely while winning few Nobel prizes. Germany's post-war Wirtschaftswunder proceeded apace while the country's proportion of Nobel prizes was at an all-time low. Indeed, in the early 1980s, a study by the US Congressional Research Service found a negative correlation between numbers of Nobel prize-winners and the rate of economic growth.

But it is a peculiarly British perversion of logic to believe that if we have no Nobel prize-winners, our economic performance will improve. Ultimately, that the question could be asked at all is a symptom of impoverishment. Britain was once a place where genius flourished and was cherished as something valuable in itself. It appears no longer to be so.

Science is, to adapt an aphorism from Jacob Bronowski, the greatest collective work of art in the 20th century. This country once made outstanding contributions to modern culture. That it is too poor to do this any more, and that no one appears to care, reveals a nation that has lost confidence in its sense of civilisation.

(Photograph omitted)

LANGUAGE: ENGLISH

LOAD-DATE-MDC: October 16, 1994

Funny Nobel quote -

2ND STORY of Level 1 printed in FULL format.

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May 21, 1994, Saturday - METRO Edition

SECTION: SCENE; Pg. 18S

LENGTH: 6040 words

BYLINE: C. RAY HALL (2); INFORMATIONAL GRAPHICS (2) KENTUCKY, BUT YOU CAN'T TAKE THE KENTUCKY OUT OF PHILLIP SHARP

DATELINE: CAMBRIDGE, MASS.

BODY:

The Massachusetts Institute of Technology's landmark is the Great Dome, a half-moon that shines across the Charles River toward Boston's Beacon Hill and down Massachusetts Avenue toward Harvard University. The dome's color and size suggest it could be a monument to gray matter. Which it is, of course.

In the dome's shadow, people talk about quarks and molecules as familiarly as if they were things that could be picked up and examined, like lint or lilacs. The etched names of great scientists -- Newton, da Vinci, Faraday -- glare down like unforgiving gods.

The overall impression of gravity is unrelieved even by the constant blur of youngsters who shuffle below, burdened by backpacks and furrowed brows. (If you were paying \$100,000 for four years at a college that rejects five out of six applicants, a furrowed brow might be the most benign outward symptom you could muster.)

Gray eminences -- human versions of the Great Dome -- are scattered about MIT as wantonly as Coke machines. If anyone bothered with such solicitousness, people at MIT would be calling each other "Doctor" all day.

"Having a Ph.D. doesn't mean much around here," says Bob Solow, a Nobel Prize-winning economist. "It's like having a dime."

In company like this, it's hard to distinguish yourself. Even winning a Nobel Prize -- as Kentucky native Phillip Sharp did last year -- means only exaltation, not immortality. MIT has been associated with 25 Nobel Prize winners. This embarrassment of riches even contributes to an "aw, shucks" attitude about the prize.

"It's long been known," Sharp says, "that the greatest single predictor of a Nobel Prize is whether your office is within 50 yards of the office of another Nobel Prize winner."

In New York, Sharp worked for James Watson, the Nobel laureate who made the term "DNA" leap from the lab into the language of the scientifically challenged. At MIT, Sharp was hired by Salvador Luria, another Nobel Prize winner. He has worked within an interoffice memo of three other laureates, David Baltimore, Susumu Tonegawa and Tom Cech.

physics -

18TH STORY of Level 1 printed in FULL format.

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The Toronto Star

October 13, 1994, Thursday, FINAL EDITION

SECTION: EDITORIAL; Pg. A26

LENGTH: 329 words

HEADLINE: Our Nobel winner

BODY:

In a typically Canadian response, Bertram Brockhouse, co-winner of this year's Nobel prize in physics, yesterday asked, "How on Earth could they pick me?"

The Royal Swedish Academy of Sciences picked the 76-year-old professor emeritus at McMaster University for his path-breaking work in determining "what atoms do."

If that explanation leaves you scratching your head, it's only because Brockhouse's "pioneering contributions to the development of neutron-scattering techniques for studies of condensed matter" involve concepts that most of us can't begin to understand.

But we all can celebrate the outstanding achievement of a Canadian scientist whose research led to the development of superconductors and better computer memory chips. And we can all take pride in an accessible university system that gave a self-employed radio repairman the education that led to a Nobel prize.

By the measure of Nobel prizes, Canada has done something right. Last year, Michael Smith of the University of B.C. shared the Nobel for chemistry. In 1989, 1990 and 1992, scientists from Canada won Nobel prizes after moving to the United States. In 1986, U of T's John Polanyi shared the chemistry prize.

But Nobel prizes are often awarded for research undertaken many years ago. In Brockhouse's case, the academy cites work he did roughly 40 years ago.

In other words, Canada's latest string of Nobel prize-winners could well be a misleading measure of our current performance in science. And we certainly can't afford to wait 20 years to find out if we are now keeping pace with the rest of the world.

With governments stressing the need to devote more resources to applied research, there is a risk that funding for basic research could be cut. If that were to happen, Canada could lose a lot more than the prestige that comes with a Nobel prize. In some areas, it would lose the chance to be on the cutting edge of discovery that feeds economic growth.

LANGUAGE: ENGLISH

LOAD-DATE-MDC: October 14, 1994

economics —

LEVEL 1 - 29 OF 61 STORIES

Copyright 1994 The Times-Picayune Publishing Co.
The Times-Picayune

October 12, 1994 Wednesday, THIRD

SECTION: MONEY; Pg. C2

LENGTH: 376 words

HEADLINE: 2 AMERICANS SHARE NOBEL IN ECONOMICS

BYLINE: From wire reports

DATELINE: STOCKHOLM, SWEDEN

BODY:

Two Americans and a German won the Nobel prize in economics Tuesday for pioneering work that shows companies do business, governments make decisions and armies fight battles much the way people play poker and chess.

Sharing the \$930,000 prize are Hungarian-born John Harsanyi, a retired professor from the University of California at Berkeley; John Nash, a mathematician at Princeton University; and Reinhard Selten of the University of Bonn.

Their discoveries have had a "tremendously important impact" on many disciplines, said the chairman of the Nobel committee that awarded the prize, Assar Lindbeck of the Royal Swedish Academy.

As early as the 1950s the three researchers began work in game theory, a relatively new branch of mathematics that arose out of efforts earlier in the century to understand competition and cooperation.

Using models such as chess and poker, the theory has developed into a major tool in characterizing modern life. One of its key features is the ability to predict when to bluff, whether the players be companies or people at a card table.

Game theory is widely applied not only in economics but also in psychology, military and political science, helping to explain the strategic interaction between individuals, business and nations alike.

"Eventually it will give us a higher standard of living because we make better decisions," Harsanyi said.

"It has some similarity with parlor games, which are used in models." Selten said from Germany.

"The analysis of these models . . . makes it easier for you to understand a lot of strategic interaction," said Selten, the first German citizen to be awarded a Nobel economics prize.

Nash, a mathematician, was singled out for developing what has become known as the "Nash Equilibrium," a formula for figuring out when it is pointless for a player to change strategy.

SCIENCE

1 Rather than have it the principal thing in my son's mind, I would gladly have him think that the sun went round the earth, and that the stars were so many spangles set in the bright blue firmament.

THOMAS ARNOLD (1795–1842), English educator, scholar. Letter, 9 May 1836 (published in *The Life and Correspondence of Thomas Arnold, D.D.*, vol. 2, 1845), on the teaching of Physical Science. Arnold welcomed that his children be well versed in science only if “in due subordination to the fulness and freshness of their knowledge on moral subjects”—an ideal he could not believe in.

2 Science knows only one commandment—contribute to science.

BERTOLT BRECHT (1898–1956), German dramatist, poet. Andrea, in *The Life of Galileo*, sc. 14 (1938–39; tr. by Howard Brenton 1980).

3 Science has nothing to be ashamed of even in the ruins of Nagasaki. The shame is theirs who appeal to other values than the human imaginative values which science has evolved.

JACOB BRONOWSKI (1908–74), British scientist, author. “The Sense of Human Dignity,” lecture, 19 March 1953, Massachusetts Institute of Technology (published in *Science and Human Values*, pt. 3, sc. 11, 1961).

4 That is the essence of science: ask an impertinent question, and you are on the way to a pertinent answer.

JACOB BRONOWSKI (1908–74), British scientist, author. *The Ascent of Man*, ch. 4 (1973).

5 The more we learn of science, the more we see that its wonderful mysteries are all explained by a few simple laws so connected together and so dependent upon each other, that we see the same mind animating them all.

OLYMPIA BROWN (1835–1900), U.S. minister (first woman ordained in U.S.). Sermon, c. 13 Jan. 1895, Mukwonago, Wis. (published in *Olympia Brown, An Autobiography*, ed. by Gwendolen B. Willis, 1960; repr. in *Annual Journal of the Universalist Historical Society*, vol. 4, 1963).

6 Science has a simple faith, which transcends utility. Nearly all men of science, all men of learning for that matter, and men of simple ways too, have it in some form and in some degree. It is the faith that it is the privilege of man to learn to understand, and that this is his mission. If we abandon that mission under stress we shall abandon it forever, for stress will not cease. Knowledge for the sake of understanding, not merely to prevail, that is the essence of our being. None can define its limits, or set its ultimate boundaries.

VANNEVAR BUSH (1890–1974), U.S. electrical engineer, physicist. *Science Is Not Enough*, “The Search for Understanding” (1967). Vannevar Bush was a zealous believer in the “missionary” function of science: during World War II, he led the U.S. Office of Scientific Research and Development, directing such programs as the development of the first atomic bomb.

7 Science, after all, is only an expression for our ignorance of our own ignorance.

SAMUEL BUTLER (1835–1902), English author. *Samuel Butler's Notebooks* (1951, p. 233).

8 O Star-eyed Science! hast thou wandered there.
To waft us home the age of despair?

THOMAS CAMPBELL (1777–1844), Scottish poet. *Pleasures of Hope*, pt. 2.

9 Science in the modern world has many uses; its chief use, however, is to provide long words to cover the errors of the rich.

G. K. CHESTERTON (1874–1936), British author. *Heretics*, “Celts and Celtophiles” (1905).

10 The latest refinements of science are linked with the cruelties of the Stone Age.

SIR WINSTON CHURCHILL (1874–1965), British statesman, writer. Speech, 26 March 1942, London, on the effects of war.

11 “Faith” is a fine invention
When Gentleman can see—
But *Microscopes* are prudent
In an Emergency

EMILY DICKINSON (1830–86), U.S. poet. *The Complete Poems*, no. 185 (1955).

12 Do you see this egg? With this you can topple every theological theory, every church or temple in the world.

DENIS DIDEROT (1713–84), French philosopher. *D'Alembert's Dream*, “Conversation between d'Alembert and Diderot” (written 1769; published 1830; repr. in *Selected Writings*, ed. by Lester K. Crocker, 1966).

13 The pursuit of science leads only to the insoluble.

BENJAMIN DISRAELI (1804–81), English statesman, author. Cardinal Grandison, in *Lothair*, ch. 17 (1870).

14 Let me arrest thy thoughts; wonder with me,
Why plowing, building, ruling and the rest,
Or most of those arts, whence our lives are blest,
By cursed *Cain's* race invented be,
And blest *Seth* vexed us with *Astronomie*.

JOHN DONNE (c. 1572–1631), English divine, metaphysical poet. *The Progress of the Soul*, st. 52.

15 Thus will the fondest dream of Phallic science be realized: a pristine new planet populated entirely by little boy clones of great scientific entrepreneurs . . . free to smash atoms, accelerate particles, or, if they are so moved, build pyramids—without any social relevance or human responsibility at all.

BARBARA EHRENREICH (b. 1941), U.S. author, columnist. *The Worst Years of Our Lives*, “Phallic Science” (1991; first published 1988).

16 The whole of science is nothing more than a refinement of everyday thinking.

ALBERT EINSTEIN (1879–1955), German-born U.S. theoretical physicist. *Out of My Later Years*, ch. 12 (1950).

17 What terrible questions we are learning to ask! The former men believed in magic, by which temples, cities, and men were swallowed up, and all trace of them gone. We are coming on the secret of a magic which sweeps out of men's minds all vestige of theism and beliefs which they and their fathers held and were framed upon.

RALPH WALDO EMERSON (1803–82), U.S. essayist, poet, philosopher. *The Conduct of Life*, “Illusions” (1860).

18 Furnished as all Europe now is with Academies of Science, with nice instruments and the spirit of experiment, the progress of human knowledge will be rapid and discoveries made of which we have at present no conception. I begin to be almost sorry I was born so soon,

what it first appears to be. Behind the white coats, the disarming jargon, the elaborate instrumentation, and at the core of what has often seemed an automatic process, one finds what Dorothy found in Oz: modern technology is human after all.

DAVID NOBLE, in Rita Arditti, Pat Brennan, and Steve Cavrak, eds., "Corporate Roots of American Science," *Science and Liberation*, 1980.

The open society, the unrestricted access to knowledge, the unplanned and uninhibited association of men for its furtherance—these are what may make a vast, complex, ever growing, ever changing, even more specialized and expert technological world, nevertheless a world of human community.

J. ROBERT OPPENHEIMER, *Science and the Common Understanding*, 1953.

Both the man of science and the man of art live always at the edge of mystery, surrounded by it. Both, as the measure of their creation, have always had to do with the harmonization of what is new with what is familiar, with the balance between novelty and synthesis, with the struggle to make partial order in total chaos.... This cannot be an easy life.

J. ROBERT OPPENHEIMER, lecture, ca. 1954, in Robert Jungk, *Brighter than a Thousand Suns*, 1958.

Science will never be able to reduce the value of a sunset to arithmetic. Nor can it reduce friendship to a formula. Laughter and love, pain and loneliness, the challenge of accomplishment in living, and the depth of insight into beauty and truth: these will always surpass the scientific mastery of nature.

LOUIS ORR, speech, American Medical Association, June 6, 1960.

I'm not afraid of facts, I welcome facts *but a congeries of facts is not equivalent to an idea*. This is the essential fallacy of the so-called "scientific" mind. People who mistake facts for ideas are incomplete thinkers; they are gossips.

CYNTHIA OZICK, "We Are the Crazy Lady and Other Feisty Feminist Fables," Francine Klagsbrun, ed., *The First Ms. Reader*, 1972.

Science provides a vision of reality seen from the perspective of reason, a perspective that sees the vast order of the universe, living and nonliving matter, as a material system governed by rules that can be known by the human mind. It is a powerful vision, formal and austere but strangely silent about many of the questions that deeply

concern us. Science shows us what exists but *not* what to do about it.

HEINZ PAGELS, *The Dreams of Reason*, 1988.

It was a *wonderful* mess at that time. Wonderful! Just great! It was so *confusing*—physics at its best, when everything is confused and you know something important lies just around the corner.

ABRAHAM PAIS, on particle physics in early 1950s, in Robert Crease and Charles Mann, *The Second Creation: Makers of the Revolution in 20th-Century Physics*, 1985.

Either we've seen the birth of the universe, or we've seen a pile of pigeon shit.

ARNO PENZIAS, 1956, in Royston Roberts, *Serendipity*, 1989.

One geometry cannot be more true than another; it can only be more *convenient*. Geometry is not true, it is advantageous.

ROBERT M. PIRSIC, *Zen and the Art of Motorcycle Maintenance*, 1974.

Traditional scientific method has always been at the very *best*, 20-20 hindsight. It's good for seeing where you've been.

ROBERT M. PIRSIC, *Zen and the Art of Motorcycle Maintenance*, 1974.

It is only in science, I find, that we can get outside ourselves. It's realistic, and to a great degree verifiable, and it has this tremendous stage on which it plays. I have the same feeling—to a certain degree—about some religious expressions... but only to a certain degree. For me, the proper study of mankind is *science*, which also means that the proper study of mankind is man.

I.I. RABI, in Jeremy Bernstein, *Experiencing Science*, 1978.

With science I felt I could grab on to actual things and try to understand them. And then they turned out to be so extraordinarily *mysterious*! Newton's laws of motion, the laws of the electromagnetic field, relativity—they're so far removed from experience, but yet there it is. It's a measure of all the other things that I look at. It gives you an approach to the human race, apart from these inherited things of nationality and whatnot, which you can't take very seriously. That's what science was for me—a citadel. I know some place where I can find out things which are *so*, and not trivial. Far from trivial.

I.I. RABI, in Robert Crease and Charles Mann, *The Second Creation: Makers of the Revolution in 20th-Century Physics*, 1986.

There is a lurking fear that some things are "not meant" to be known, that some inquiries are too dangerous for human beings to make.

CARE SAGAN, *Broca's Brain*, 1979.

A machine is not a genie, it does not work by magic, it does not possess a will, and [Norbert] Wiener to the contrary, nothing comes out which has not been put in, barring of course, an infrequent case of malfunctioning.... The "intentions" which the machine seems to manifest are the intentions of the human programmer, as specified in advance, or they are subsidiary intentions derived from these, following rules specified by the programmer.... The machine will not and cannot do any of these things until it has been instructed as to how to proceed.... To believe otherwise is either to believe in magic or to believe that the existence of man's will is an illusion and that man's actions are as mechanical as the machine's.

ARTHUR L. SAMUEL, *Science*, September 16, 1960.

The real problem is not whether machines think but whether men do.

B.F. SKINNER, *Contingencies of Reinforcement*, 1969.

Technology, while adding daily to our physical ease, throws daily another loop of fine wire around our souls. It contributes hugely to our mobility, which we must not confuse with freedom. The extensions of our senses, which we find so fascinating, are not adding to the discrimination of our minds, since we need increasingly to take the reading of a needle on a dial to discover whether we think something is good or bad, or right or wrong.

ADLAI E. STEVENSON, "My Faith in Democratic Capitalism," *Fortune*, October, 1955.

Mystics always hope that science will some day overtake them.

BOOTH TARKINGTON, *Looking Forward*, 1926.

If there ever was a misnomer, it is "exact science." Science has always been full of mistakes. The present day is no exception. And our mistakes are good mistakes; they require a genius to correct them. Of course, we do not see our own mistakes.

EDWARD TELLER, *Conversations on the Dark Secrets of Physics*, 1991.

Our technological powers increase, but the side effects and potential hazards also escalate.

ALVIN TOFFLER, *Future Shock*, 1970.

That great, growing engine of change—technology.

ALVIN TOFFLER, *Future Shock*, 1970.

Technology feeds on itself. Technology makes more technology possible.

ALVIN TOFFLER, *Future Shock*, 1970.

Each new machine or technique, in a sense, changes all existing machines and techniques, by permitting us to put them together into new combinations. The number of possible combinations rises exponentially as the number of new machines or techniques rises arithmetically. Indeed, each new combination may, itself, be regarded as a new super-machine.

ALVIN TOFFLER, *Future Shock*, 1970.

I want to change the way people think about their everyday lives. How you think is going to affect who you marry, what kind of relationship you establish, whether and in what manner you reproduce. That's day-to-day thinking, right? But they don't even teach courses on that stuff.... Life is intrinsically biological. It's absurd not to use our best biological concept.

ROBERT TRIVERS, in Roger Bingham, "Robert Trivers: Biologist of Behavior," *A Passion to Know: 20 Profiles in Science*, 1985.

[S]cience seldom proceeds in the straightforward logical manner imagined by outsiders. Instead, its steps forward (and sometimes backward) are often very human events in which personalities and cultural traditions play major roles.... [Science moves with] the spirit of an adventure characterized both by youthful arrogance and by the belief that the truth, once found, would be simple as well as pretty.

JAMES D. WATSON, *The Double Helix*, 1968.

Specialization has gotten out of hand. There are more branches in the tree of knowledge than there are in the tree of life. A petrologist studies rocks; a pedologist studies soils. The first one sieves the soil and throws away the rocks. The second one picks up the rocks and brushes off the soil. Out in the field, they bump into each other only like Laurel and Hardy, by accident, when they are both backing up.

JONATHAN WEINER, *The Next One Hundred Years*, 1990.

But science and technology are only one of the avenues toward reality: others are equally needed to comprehend the full significance of our existence. Indeed, these other avenues are necessary

for the prevention of thoughtless and inhuman abuses of the results of science.

VICTOR WEISSKOPF, *The Privilege of Being a Physicist*, 1989.

Science is an important part of the humanities because it is based on an essential human trait: curiosity about the how and why of our environment. We must foster wonder, joy of insight.

VICTOR WEISSKOPF, *The Privilege of Being a Physicist*, 1989.

The history of physics shows that deeper insights into the nature of things are best achieved with distance from daily experience.

VICTOR WEISSKOPF, *The Privilege of Being a Physicist*, 1989.

Some people maintain that scientific insight has eliminated the need for meaning. I do not agree. The scientific worldview established the notion that there is a sense and purpose in the development of the universe when it recognized the evolution from the primal explosion to matter, life, and humanity. In humans, nature begins to recognize itself.

VICTOR WEISSKOPF, *The Joy of Insight*, 1991.

The same system that produced a bewildering succession of new-model, style-obsolescent autos and refrigerators can also produce an endless out-pouring of new-model, style-obsolescent science.

HARVEY WHEELER, *New York Times*, August 11, 1975.

The goal is to understand the plan of creation, period.

JOHN WHEELER, in Dennis Overbye, "John Wheeler: Messenger at the Gates of Time," *A Passion to Know: 20 Profiles in Science*, 1985.

The audaciously destructive tendencies of our species run deep and are poorly understood. They are so difficult to probe and manage as to suggest an archaic biological origin. We run a risk if we continue to diagnose them as by-products of history and suppose that they be erased with simple economic and political remedies.

EDWARD O. WILSON, *Biophilia*, 1984.

Important science is not just any similarity glimpsed for the first time. It offers analogues that map the gateways to unexplored terrain.

EDWARD O. WILSON, *Biophilia*, 1984.

To a considerable degree science consists in originating the maximum amount of information with the minimum expenditure of energy. Beau-

ty is the cleanness of line in such formulations, along with symmetry, surprise, and congruence with other prevailing beliefs.

EDWARD O. WILSON, *Biophilia*, 1984.

As a builder of accelerators, I could thrill to what appeared to me to be a medieval physicist responding to a very challenging physical problem. I saw the similarity between the cathedral and the accelerator. The one structure was intended to reach a soaring height in space; the other is intended to reach a comparable height in energy.

ROBERT WILSON, in Philip Hiltz, "Robert Wilson: Lord of the Rings," *A Passion to Know: 20 Profiles in Science*, 1985.

SUCCESS FOUR FLIGHTS THURSDAY MORNING ALL AGAINST TWENTY-ONE MILE WIND STARTED FROM LEVEL WITH ENGINE POWER ALONE AVERAGE SPEED THROUGH AIR THIRTY-ONE MILES LONGEST 59 SECONDS INFORM PRESS HOME CHRISTMAS.

ORVILLE AND WILBUR WRIGHT, telegram to their father from Kitty Hawk, North Carolina, December 17, 1903.

We did not know how to make the theory fit experiment. It was our judgment, however, that the beauty of the idea alone merited attention.

CHEN NING YANG, in Robert Crease and Charles Mann, *The Second Creation: Makers of the Revolution in 20th-Century Physics*, 1985.

COMMUNICATIONS

The computer is only a fast idiot, it has no imagination; it cannot originate action. It is, and will remain, only a tool to man.

AMERICAN LIBRARY ASSOCIATION STATEMENT ON UNIVAC COMPUTER EXHIBITED AT NEW YORK WORLD'S FAIR, 1964.

If arithmetical skill is the measure of intelligence, then computers have been more intelligent than all human beings all along. If the ability to play chess is the measure, then there are computers now in existence that are more intelligent than any but a very few human beings. However, if insight, intuition, creativity, the ability to view a problem as a whole and guess the answer by the "feel" of the situation, is a measure of intelligence, computers are very unintelligent indeed. Nor can we see right now how this deficiency in computers can be easily remedied, since human beings cannot program a computer to be intuitive or creative for the very good reason that we

notes

Paul Sereno, the University of Chicago paleontologist who found the oldest-known dinosaur and the dinosaur with the most primitive characteristics, has racked up another impressive discovery.

In the October 14 issue of *Science*, he and his colleagues describe two new species of dinosaurs from 130-million-year-old remains in the Sahara that show that dinosaur evolution was relatively unaffected by the ancient splitting of the continents.

One of the species, a theropod, is the most complete skeleton of a carnivore from the Cretaceous geological period ever found in Africa. The other is a sauropod—a large, four-legged herbivore—from a lineage of dinosaurs thought to have died out millions of years earlier.

Both species are from lineages that were separated from their South American counterparts after the fragmenting of the supercontinent Pangea 170 million years ago. Paleontologists expected African species after the continental split to look distinctly different from their relatives on other continents. But their close resemblance to more ancient species from North America, Asia, and Europe suggests that they evolved and spread worldwide before the supercontinent completely separated.

Element 106 won't be named seaborgium in honor of Glenn T. Seaborg. The reason: the Nobel laureate is still alive.

An international organization responsible for naming elements rejected recommendations to name the element discovered at the University of California's Lawrence Berkeley Laboratory for Mr. Seaborg, an associate director of the laboratory. The element will instead be named rutherfordium, for the deceased British nuclear physicist Ernest Rutherford.

Two groups of researchers have identified a chromosomal region that they believe contains the gene or genes that are among the chief causes of dyslexia.

In the past, teachers and scientists have noticed that reading difficulties can run in families. Researchers have also found statistical evidence for a strong genetic component for dyslexia.

The two latest studies, reported in a single paper in the journal *Science* last week, are the first to indicate where the actual gene or genes connected with the disorder may be found. The researchers have narrowed the search for the disability's genetic basis to a chromosomal region that could contain anywhere from a dozen genes to a hundred.

"We have gone from looking for a needle in a haystack to looking for a needle in a bale of hay," says David W. Fulk, a professor of psychology at the University of Colorado at Boulder and one of the scientists who worked on the studies.

The Nobels

MEDICINE

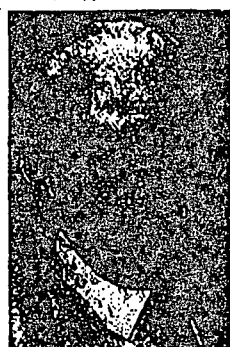


Alfred G. Gilman
U. of Texas
Southwestern
Medical Center



Martin Rodbell
National Institute
of Environmental
Health Sciences

ECONOMICS



John C. Harsanyi
U. of California,
at Berkeley



John F. Nash
Princeton U.

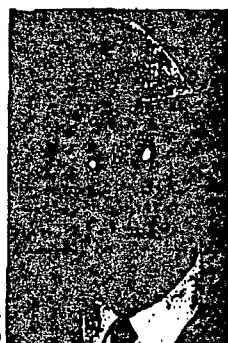


Reinhard Selten
U. of Bonn

PHYSICS



Clifford G. Shull
Massachusetts Institute
of Technology



Bertram N. Brockhouse
McMaster U. (Ontario)

CHEMISTRY



George A. Olah
U. of Southern
California



Kenzaburo Oe

PHOTOGRAPHS BY AGENCE FRANCE PRESSE

1994 prizes awarded
to seven academics
in U.S., Canada, Germany

By Kim A. McDonald

NOBEL PRIZES in science were awarded last week to four American researchers, three of whom are affiliated with U.S. universities, and to a Canadian professor at McMaster University. The prize in economics was shared by two American academics and a German professor at the University of Bonn, while the literature prize went to Kenzaburo Oe, a novelist and essayist in Japan.

Mr. Oe was cited by the Swedish Academy for his "poetic force," which "creates an imagined world, where life and myth condense to form a disconcerting picture of the human predicament today." Among his most influential works is the 1967 novel, *The Silent Cry*.

The Nobel Peace Prize had not yet been awarded when *The Chronicle* went to press, but newspapers in Norway reported last week that the Norwegian Nobel Committee planned to give the award to Prime Minister Yitzhak Rabin of Israel and the P.L.O. chairman Yasir Arafat for the peace accord they signed between Israel and the Palestine Liberation Organization in September 1993.

AN AWARD OF \$900,000

Each of the prizes, which includes a gold medal and diploma for each recipient, carries with it a monetary award this year of seven million Swedish kronor, or \$930,000. That amount will be split equally by those sharing each of this year's prizes.

The Nobel Prize in Physics was awarded to Clifford G. Shull, an emeritus professor of physics at the Massachusetts Institute of Technology, and Bertram N. Brockhouse, a retired professor of physics at McMaster University in Ontario. The two were cited by the Swedish Royal Academy of Sciences for their development of neutron-scattering techniques that have revolutionized the study of materials.

Such techniques have become particularly useful for physicists to see how atoms are arranged and vibrate within solids and to detect their movements within liquids and magnetic material. They are employed in a wide variety of areas of study, from the examination of new high-temperature superconductors to tests of catalytic exhaust cleaning to studies of elastic properties of polymers and the structure of viruses.

THE POSITION OF ATOMS IN CRYSTALS

Mr. Shull developed the neutron-scattering technique, which allowed researchers to determine the position of atoms in crystals from elastically scattered neutrons, using the relatively simple nuclear reactors that became available shortly after World War II. Mr. Brockhouse, meanwhile, concentrated his efforts on the

Continued on Page A26

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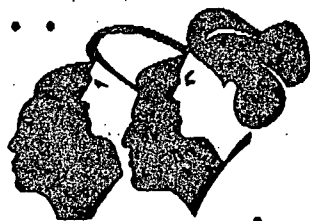
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Nobel Prizes Go to 7 Academics
in U.S., Canada, and Germany

Continued From Page A24

study of inelastically scattered neutrons, developing during the 1950's a technique known as neutron spectroscopy that allowed scientists to study the dynamics of atoms within crystals and liquids.

Using that technique, the academy said, scientists are now able to study "atomic vibrations in crystals, diffusion movements in liquids, and fluctuations in magnetic material."

WORK ON 'CARBOCATIONS'

George A. Olah, a professor of chemistry at the University of Southern California and director of the university's hydrocarbon-research institute, won the Nobel Prize in Chemistry for his contributions to the study of a class of organic compounds known as "carbocations."

In the early 1960's, Mr. Olah and his co-workers discovered that carbocations—positively charged hydrocarbons—could be prepared by using extremely acidic compounds known as "super acids." That discovery, the Royal Swedish Academy of Sciences said in its citation, "completely transformed the sci-

entific study of the elusive carbocations" by allowing the synthesis of a large number of carbocations that have been studied in great detail.

Mr. Olah also demonstrated how knowledge of super acids and carbocations could be used in the synthesis of new and important organic compounds. "His work has resulted," the academy said, "in new methods for the conversion of straight-chain hydrocarbons (when used in combustion engines these have a very low octane number and they are also difficult to degrade biologically) into branched hydrocarbons that have high octane numbers and are more easily biodegradable."

CELL COMMUNICATION

Alfred G. Gilman and Martin Rodbell, the two American winners of the prize for physiology or medicine, were cited for their discovery of "G-proteins"—substances that help cells communicate with their external environment by acting as information switchboards.

The Nobel Assembly at Sweden's Karolinska Institute, which

selects the recipients of the medicine prize, said the discoveries of the two scientists had been of "paramount importance" in understanding how cells transmit information from the outside through their cell membranes.

Mr. Rodbell, a biochemist who retired last summer as head of the signal-transduction laboratory at the National Institute of Environmental Health Sciences in Research Triangle Park, N.C., demonstrated in a set of pioneering experiments at the National Institutes of Health in the late 1960's and early 1970's how chemical signals are transmitted through the cell membrane.

Building on that work, Mr. Gilman attempted in experiments at the University of Virginia to unravel the chemical nature of that interaction. In those experiments, Mr. Gilman, who is now chairman of the pharmacology department at the University of Texas Southwestern Medical Center, managed to isolate the first G-protein, so named because it interacts with a nucleotide called guanosine triphosphate, or GTP.

Scientists have since discovered more than 300 receptors on cells for G-proteins. This has "opened up a new and rapidly expanding area of knowledge," the institute said, by allowing researchers to un-

MIT Pokes Fun at Science With the 'Ig Nobel' Prizes

CAMBRIDGE, MASS. A NUMBER of prestigious scientific awards recognize achievement in fields or activities that cannot receive Nobel Prizes.

But few researchers are anxious to win one alternative to the Nobel that is given each October by the museum at the Massachusetts Institute of Technology here.

Called the "Ig Nobel Prizes," the awards poke fun at science and some of its practitioners by honoring people and organizations

whose achievements "cannot or should not be reproduced."

This year's physics prize, for instance, was given to the Japanese Meteorological Agency "for its seven-year study of whether earthquakes are caused by catfish wiggling their tails," according to a citation from M.I.T.

The peace prize went to John Hagelin of Maharishi International University and the Institute of Science, Technology and Public Policy, both of which are located in Fairfield, Iowa, "for his experi-

mental conclusion that 4,000 trained meditators caused an 18-percent decrease in violent crime in Washington."

Robert A. Lopez, a veterinarian in Westport, N.Y., won the entomology award "for his series of experiments in obtaining ear mites from cats, inserting them into his own ear, and carefully observing and analyzing the results."

A TOTAL OF 10 PRIZES

The mathematics prize was bestowed on the Southern Baptist Church of Alabama for its "county-by-county estimate of how many Alabama citizens will go to Hell if they don't repent."

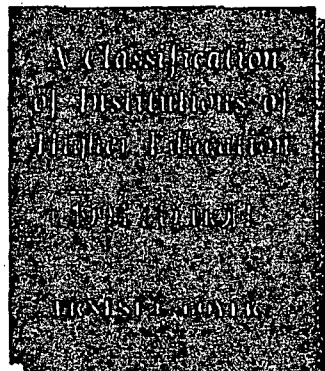
In all, 10 prizes were given this year, the fourth consecutive year in which the awards were given. They were handed out at a ceremony at M.I.T. by three Nobel laureates—Dudley Herschbach, who shared the 1986 Nobel Prize in Chemistry; William N. Lipscomb, winner of the 1976 chemistry prize; and Richard Roberts, co-winner of the 1993 prize in physiology or medicine. The Nobel Prize winners took part in the public ribbing before an audience of 1,200 hecklers, many of whom dressed for the occasion in laboratory coats, bathrobes, or old computer equipment.

Surprisingly, many of the recipients show up in person to claim their prize, which consists of a replica of half a brain mounted on a pedestal, a lunch box, a pair of brown socks, an "eye-glass repair kit" that consists of a piece of tape, and a clip-on bow tie.

"Either they love it and rush right down," says Kathleen Thurston-Lightly, a spokeswoman for the M.I.T. museum, when recipients

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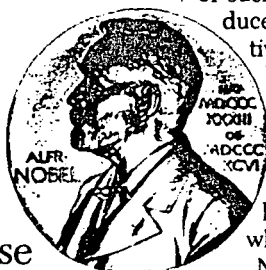
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■ NOBEL PRIZES

Bittersweet Honors

Behind the awards: tales of pain, lost promise and recognition too long deferred



THE MYTH IS SIMPLE AND SATISFYING: genius labors long and hard, achieves brilliant success, wins Nobel Prize, basks in glory. But prizewinners' stories are rarely so straightforward. This year's controversial Peace Prize, for example, which was shared by Yasser Arafat, Yitzhak Rabin and Shimon Peres, has triggered as much controversy as celebration. And for some of the other laureates, there are, behind the Nobel Committee's glowing citations, tales of recognition too long deferred, of promise lost, of pain and tragedy.

ECONOMICS Often the winner of a Nobel Prize is an obscure academic, noticed by few in his community until he is thrust into the spotlight. But when photographs of John Nash appeared in the press last week, a common reaction in and around Princeton, New Jersey, was a shock of recognition: "Oh, my gosh, it's him!" Nash, who shared the Economics Prize with John Harsanyi of the Haas School of Business at the University of California, Berkeley, and Reinhard Selten of the University of Bonn, is a familiar eccentric in the university town—a quiet, detached man who frequently spends his time riding the local "Dinky" train on its short hop between Princeton and Princeton Junction, reading newspapers discarded by other passengers. Some knew him as the author of the enormously complicated mathematical equations that appeared on classroom blackboards from time to time—the product of a splendid but troubled mind working out his thoughts when no one was around.

The work that earned Nash his prize was largely completed by 1950 when, at age 22, he submitted the Princeton Ph.D. thesis that has been described as the rock on which the

mathematics of game theory is based. Game theory tries to explain economic behavior by analyzing the strategies "players" in the marketplace use to maximize their winnings. Nash, drawing on the dynamics of such games as poker and chess, introduced the distinction between cooperative games, in which players form binding agreements, and non-cooperative ones, in which they don't. His "Nash Equilibrium" has been used by generations of corporate and military strategists to help decide when to hold 'em and when to fold 'em.

Nash taught in the '50s at the Massachusetts Institute of Technology, but his career there was reportedly interrupted by bouts of mental illness. He returned to Princeton, where he became increasingly withdrawn. Eventually, the mathematics department appointed him a "visiting research collaborator," a post that has allowed the man a university press officer describes as "incredibly brilliant and eccentric" to roam his beloved campus freely for the past 25 years, using its computers whenever he likes, and occasionally its blackboards.

MEDICINE Recognition came a few months too late to save co-winner Martin Rodbell from the budget ax. He retired in June from the National Institute of Environmental Health Sciences after funding dried up for

his research into how the billions of cells that make up the body communicate with one another. Working independently, Rodbell and Dr. Alfred G. Gilman of the University of Texas Southwestern Medical Center in Dallas discovered that the cells employ a kind of molecular switchboard to sort out incoming chemical and hormonal messages. The switches in this biological telephone system, molecules called G proteins, have since been implicated in everything from diabetes to alcoholism to whooping cough.

PHYSICS Shoot neutrons through a liquid or solid, and these subatomic particles will bounce off the atoms inside. The angles at which the quantum bullets ricochet tell scientists how the target atoms are arranged. That knowledge has already led to advances in semiconductors and may someday explain the bizarre phenomenon of high-temperature superconductivity. Clifford Shull, now retired from M.I.T., and Bertram Brockhouse from McMaster University in Ontario, Canada, helped perfect neutron-scattering techniques in the 1940s and '50s. Today, nearly a half-century later, they have Nobels to show for it. Ironically, the man who did the pioneering work in the field, Shull's mentor Ernest Wollan, died in 1984. By Nobel rules, the prize is never awarded posthumously.

CHEMISTRY Oil refining, coal liquefaction and other related industrial processes depend on chemists' being able to manipulate the complex molecules known as hydrocarbons. George Olah of the University of Southern California discovered in the 1960s how to slow down—and thus control—hydrocarbon reactions by supercooling them. His work led directly to the development of higher-octane gasoline—and earned him this year's Chemistry Prize.

LITERATURE Kenzaburo Oe was a child of 10 when World War II ended; occupying foreigners, ruins, humiliations and guilt filled the Japanese landscape of his adolescence. His early fiction and essays were unusually intense by Japanese standards, tinged with pessimism and despair. After 1963, when his first son was born brain damaged, Oe's work became even more personal; a helpless or deformed child figure recurs, suggesting both implacable fate and the possibility of redemption. Compared with the four previous laureates—Octavio Paz, Nadine Gordimer, Derek Walcott and Toni Morrison—Oe is little known but, thanks to the Swedish Academy, not for long.



BRILLIANT ECCENTRIC: Nash completed his prizewinning work by age 22 and has lived a troubled life ever since

LEVEL 1 - 35 OF 61 STORIES

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October 11, 1994; Tuesday R 05:38 Eastern Time

LENGTH: 294 words

HEADLINE: Literature Prize Announcement Thursday

DATELINE: STOCKHOLM, Sweden

BODY:

The winner of the 1994 Nobel Literature Prize will be announced Thursday, the Swedish Academy said Tuesday.

The prize is worth 7 million kronor (dlrs 930,000). Last year's winner was American writer Toni Morrison.

All six Nobel prizes are being awarded this week, ending with the announcement of the Nobel Peace prize in Oslo, Norway, on Friday.

The Nobel Memorial Prize in Economic Science is due to be announced Tuesday. The Nobel prizes in physics and in chemistry both will be awarded Wednesday.

On Monday, Americans Alfred Gilman and Martin Rodbell won the medicine prize for revealing how human cells take orders and run rampant in diseases like cholera and diabetes.

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(PROFILE

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LANGUAGE: ENGLISH

LOAD-DATE-MDC: October 11, 1994

LEVEL 1 - 25 OF 61 STORIES

The Associated Press

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October 12, 1994, Wednesday, AM cycle

SECTION: International News

LENGTH: 265 words

HEADLINE: Excerpts From Nobel Chemistry Prize Announcement

BYLINE: By The Associated Press

BODY:

Excerpts from the announcement in Stockholm, Sweden, awarding the Nobel Prize in chemistry to George A. Olah.

The citation:

For his contributions to carbocation chemistry.

The announcement:

Hydrocarbons constitute a very large and important group of organic compounds - for example most products from natural mineral oil are hydrocarbons. Although some hydrocarbons prepared by chemists around the turn of the century were thought to be ionic - e.g., a group of compounds formed from benzene and methane ("triarylmethane derivatives") these were largely regarded as curiosities.

When some chemists in Britain (Ingold and Hughes) and Germany (Meerwein) in the 1920s and 1930s started detailed studies of how chemical reactions between organic molecules took place it, however, became apparent that positively charged hydrocarbons - what chemists call "carbocations" - actually could occur as very shortlived (lifetimes of microseconds to nanoseconds) intermediates in the reactions.

Since these postulated "carbocation intermediates" were likely to be not only very shortlived but also very reactive, it was generally assumed that one would never be able to prepare them in some quantities. Nor be able to study their properties with different physical techniques - e.g., NMR and infrared (IR) spectroscopy or X-ray diffraction - like one could do with normal unchanged hydrocarbons. But the direction of this field did change completely through the original and imaginative work by this year's Nobel Prize laureate in chemistry Professor George A. Olah.

LANGUAGE: ENGLISH

Literature prize

LEVEL 1 - 1 OF 61 STORIES

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The Daily Yomiuri

October 28, 1994, Friday

SECTION: Pg. 2

LENGTH: 201 words

HEADLINE: Oe declines award by home prefecture

BYLINE: Yomiuri Shimbun

DATELINE: MATSUYAMA

BODY:

(CH-01)

Kenzaburo Oe, who was named this year's recipient of the Nobel Prize in Literature earlier this month, has declined to accept an award by the Ehime prefectural government, The Yomiuri Shimbun learned Thursday.

After the Oct. 13 announcement of the Nobel prize laureates, the Ehime prefectural government considered including Oe, a native of the prefecture, in the list of nominees for an award to be given to people from the prefecture with distinguished achievements.

An official at the prefectural government's Tokyo office visited Oe's home in Tokyo Oct. 15 to ask whether he would accept the award if chosen.

Oe's wife told the official that Oe would not accept it because he had already declined to receive the central government's Order of Culture award.

Based on his wife's answer, the prefecture decided not to include Oe in the list of nominees.

Masatomo Takagi, deputy governor of Ehime Prefecture and chairman of the committee to choose award recipients, declined to comment on the issue to The Yomiuri Shimbun, saying they "had never officially nominated him."

Eight people were officially nominated for the prefectural award and three will receive it Nov. 3, Culture Day.

LOAD-DATE-MDC: October 28, 1994

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Information Bank Abstracts
PHILADELPHIA INQUIRER

October 15, 1994, Saturday

SECTION: Section A; Page 1, Column 6

LENGTH: 179 words

HEADLINE: RABIN, PERES AND ARAFAT WIN NOBEL

BYLINE: ;FRED BARBASH

JOURNAL-CODE: PHI

ABSTRACT:

Palestinian leader Yasir Arafat and two Israelis--Prime Minister Yitzhak Rabin and Foreign Minister Shimon Peres--are named recipients of this year's Nobel Peace Prize; announcement leads one of Nobel Prize Committee members to resign in protest; Kaare Kristiansen says his colleagues chose wrong man in Arafat--whom he describes as 'too tainted by violence, terror and torture'--and the wrong time to honor the 'uncertain' peace between Israelis and Palestinians; photos (L)

GRAPHIC: Photograph

LANGUAGE: ENGLISH

LOAD-DATE-MDC: October 18, 1994

Science and Technology

See also **American Society; Dreams and Ideals—Change, Risk; Ethics and Morality; The Human Condition—Creativity, Imagination, Ingenuity; Religion and Spirituality—Science and Religion; War and Peace; Work—Scientists**

That which today calls itself science gives us more and more information, an indigestible glut of information, and less and less understanding.

EDWARD ABBEY, "Down the River with Henry Thoreau," *Words From the Land*, 1981.

If the human race wants to go to hell in a basket, technology can help it get there by jet. It won't change the desire or the direction, but it can greatly speed the passage.

CHARLES M. ALLEN, speech, "Unity in a University," Wake Forest University, Winston-Salem, North Carolina, April 25, 1967.

The machine [herded] men into towns and cities, the age of the factory....Men all began to dress alike, eat the same foods, read the same kind of newspapers and books. Minds began to be standardized as were the clothes men wore.

SHERWOOD ANDERSON, 1926, in Lois and Alan Gordon, *American Chronicle*, 1987.

Every answer given arouses new questions. The progress of science is matched by an increase in the hidden and mysterious.

LEO BAECK, *Judaism and Science*, 1949.

It is not clear to anyone, least of all the practitioners, how science and technology in their headlong course do or should influence ethics and law, education and government, art and social philosophy, religion and the life of the affections. Yet science is an all-pervasive energy, for it is at once a mode of thought, a source of strong emotion, and a faith as fanatical as any in history.

JACQUES BARZUN, *Science: The Glorious Entertainment*, 1964.

For the educated, the authority of science rested on the strictness of its method; for the mass, it rested on its powers of explanation.

JACQUES BARZUN, *Science: The Glorious Entertainment*, 1964.

Once regarded as the herald of enlightenment in all spheres of knowledge, science is now increasingly seen as a strictly instrumental system of control. Its use as a means of social manipulation and its role in restricting human freedom now parallel in every detail its use as a means of natural manipulation.

MURRAY BOOKCHIN, *The Ecology of Freedom*, 1982.

Just as the American's love affair with his land produced pioneering adventures and unceasing excitement in the conquest of the continent, so too his latter-day romance with the Machine produced pioneering adventures—of a new kind...there were no boundaries to a machine-made world.

DANIEL BOORSTIN, *Hidden History*, 1987.

Consider the wheelbarrow. It may lack the grace of an airplane, the speed of an automobile, the initial capacity of a freight car, but its humble wheel marked out the path of what civilization we still have. Particularly that phase of civilization which leads down Main Street, through the front gate, around the house and into the back garden.

HAL BORLAND, *New York Times*, April 27, 1947.

DNA was the first three-dimensional Xerox machine.

KENNETH BOULDING, "Energy and the Environment," *Beasts, Ballads, and Bouldingisms*, 1976.

We have grasped the mystery of the atom and rejected the Sermon on the Mount.

OMAR BRADLEY, speech, Boston, Massachusetts, November 10, 1948.

That is the essence of science: ask an impertinent question, and you are on the way to the pertinent answer.

JACOB BRONOWSKI, *The Ascent of Man*, 1973.

We landed on the Sea of Tranquility, in the cool of the early lunar morning, when the long shadows would aid our perception.

The sun was only ten degrees above the horizon, while the earth turned through nearly a full day during our stay. The sun at Tranquility Base rose barely eleven degrees—a small fraction of the monthlong lunar day. There was a peculiar sensation of the duality of time—the swift rush of events that characterizes all our lives—and the ponderous parade which makes the aging of the universe.

Both kinds of time were evident—the first by the routine events of the flight—whose planning and execution were detailed to fractions of a second—the latter by rocks around us, unchanged throughout the history of man—whose three-billion-year-old secrets made them the treasures we sought.

The plaque on the "Eagle" which summarized our hopes bears this message:

Here men from the planet Earth first set foot upon the moon July 1969 A.D.

We came in peace for all mankind whose nineteen hundred and sixty-nine years had constituted the majority of the ages of Pisces—a twelfth of the great year that is measured by the thousand generations the precession of the earth's axis requires to scribe a giant circle in the heavens.

In the next twenty centuries, the age of Aquarius of the great year, the age for which our young people have such high hopes, humanity may begin to understand its most baffling mystery—where are we going? The earth is, in fact, traveling many thousands of miles per hour in the direction of the constellation Hercules—to some unknown destination in the cosmos. Man must understand his universe in order to understand his destiny.

Mystery, however, is a very necessary ingredient in our lives.

Mystery creates wonder and wonder is the basis for man's desire to understand. Who knows what mysteries will be solved in our lifetime, and what new riddles will become the challenge of the new generations? Science has not mastered prophesy. We predict too much for next year yet far too little for the next ten. Responding to challenge is one of democracy's great strengths.

Our successes in space lead us to hope that this strength can be used in the next decade in the solution of many of our planet's problems.

Several weeks ago I enjoyed the warmth of reflection on the true meaning of the spirit of Apollo.

I stood in the highlands of this nation, near the Continental Divide, introducing to my sons the wonders of nature, and pleasures of looking for deer and elk.

In their enthusiasm for the view they frequently stumbled on the rocky trails. But when they looked only to their footing, they did not see the elk. To those of you who have advocated looking high we owe our sincere gratitude, for you have granted us the opportunity to see some of the grandest views of the Creator.

To those of you who have been our honest critics, we also thank, for you have reminded us that we dare not forget to watch the trail. We carried on Apollo 11 two flags of this Union that had flown over the Capitol, one over the House of Representatives, one over the Senate.

It is our privilege to return them now in these halls which exemplify man's highest purpose—to serve one's fellow man.

We thank you, on behalf of all the men of Apollo, for giving us the privilege of joining you in serving—for all mankind.

Neil A. Armstrong, speech to Congress, September 16, 1969.

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Why does this magnificent applied science which saves work and makes life easier bring us so little happiness? The simple answer runs: Because we have not yet learned to make sensible use of it.

ALBERT EINSTEIN, speech, California Institute of Technology, February, 1931.

The whole of science is nothing more than a refinement of everyday thinking.

ALBERT EINSTEIN, "Physics and Reality," 1936.

Concern for man himself and his fate must always form the chief interest of all technical endeavors....Never forget this in the midst of your diagrams and equations.

ALBERT EINSTEIN, in Robert S. Lynd, *Knowledge for What?*, 1939.

Science can only ascertain what *is*, but not what *should be*, and outside of its domain value judgments of all kinds remain necessary.

ALBERT EINSTEIN, *Out of My Later Years*, 1950.

In the end, science as we know it has two basic types of practitioners. One is the educated man who still has a controlled sense of wonder before the universal mystery, whether it hides in a snail's eye or within the light that impinges on that delicate organ. The second kind of observer is the extreme reductionist who is so busy stripping things apart that the tremendous mystery has been reduced to a trifle, to intangibles not worth troubling one's head about.

LOREN EISELEY, "Science and the Sense of the Holy," *The Star Thrower*, 1978.

Science, in the very act of solving problems, creates more of them.

ABRAHAM FLEXNER, *Universities*, 1930.

The danger of the past was that men became slaves. The danger of the future is that men may become robots.

ERICH FROMM, *The Sane Society*, 1955.

Science has radically changed the conditions of human life on earth. It has expanded our knowledge and our power but not our capacity to use them with wisdom.

J. WILLIAM FULBRIGHT, *Old Myths and New Realities*, 1964.

It is a commonplace of modern technology that problems have solutions before there is knowledge of how they are to be solved.

JOHN KENNETH GALBRAITH, *The New Industrial State*, 1967.

[By 1940] the relativity theory will be considered a joke.

GEORGE FRANCIS GILLETTE, in Martin Gardner, *Fads and Fallacies in the Name of Science*, 1929.

Once upon a time we were just plain people. But that was before we began having relationships with mechanical systems. Get involved with a machine and sooner or later you are reduced to a factor.

ELLEN GOODMAN, "The Human Factor," *Washington Post*, January, 1987.

In all human activities, it is not ideas or machines that dominate; it is people. I have heard people speak of "the effect of personality on science." But this is a backward thought. Rather, we should talk about the effect of science on personalities. Science is not the dispassionate analysis of impartial data. It is the human, and thus passionate, exercise of skill and sense on such data. Science is not an exercise in objectivity, but, more accurately, an exercise in which objectivity is prized.

PHILIP HILTS, *Scientific Temperaments: Three Lives in Contemporary Science*, 1982.

As children we all possess a natural, uninhibited curiosity, a hunger for explanation, which seems to die slowly as we age—suppressed, I suppose, by the high value we place on conformity and by the need not to appear ignorant. It betokens a conviction that somehow science is innately incomprehensible. It precludes reaching deeper, thereby denying the profound truth that understanding enriches experience, that explanation vastly enhances the beauty of the natural world in the eye of the beholder.

MAHLON HOAGLAND, *Toward the Habit of Truth*, 1990.

It is often the scientist's experience that he senses the nearness of truth when...connections are envisioned. A connection is a step toward simplification, unification. Simplicity is indeed often the sign of truth and a criterion of beauty.

MAHLON HOAGLAND, *Toward the Habit of Truth*, 1990.

One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man.

ELBERT HUBBARD, *The Roycroft Dictionary and Book of Epigrams*, 1923.

Equipped with his five senses, man explores the universe around him and calls the adventure Science.

EDWIN POWELL HUBBLE, *The Nature of Science*, 1954.

Modern technology was made in America.

THOMAS HUGHES, *American Genesis: A Century of Invention and Technological Enthusiasm*, 1989.

By 1900 [Americans] had reached the promised land of the technological world, the world as artifact. In doing so they had acquired traits that have become characteristically American. A nation of machine makers and system builders, they became imbued with a drive for order, system, and control.

THOMAS HUGHES, *American Genesis: A Century of Invention and Technological Enthusiasm*, 1989.

It's as important an event as would be the transfer of the Vatican from Rome to the New World. The Pope of Physics has moved and the United States will now become the center of the natural sciences.

PAUL LANGEVIN, on Albert Einstein's move to Princeton, New Jersey, from Germany in 1933, in Robert Jungk, *Brighter than a Thousand Suns*, 1958.

Without meaning to belittle the wonders of science, I do not think they can absolve mankind of suffering, desire, madness, and death.

LEWIS H. LAPHAM, speech, "The Senior Practitioner," Northwestern Medical School, June, 1987.

It is a curious paradox that aversion of future harm seems more important than the promise of future benefit. That was not always true. Those who are unwilling to invent in the future haven't earned one.

H.W. LEWIS, *Technological Risk*, 1990.

The machine that frees a man's back of drudgery does not thereby make his spirit free. Technology has made us more productive, but it does not necessarily enrich our lives. Engineers can build us great dams, but only great people make a valley great. There is no technology of goodness. Men must make themselves spiritually free.

DAVID E. LILIENTHAL, *TVA: Democracy on the March*, 1944.

You cannot endow even the best machine with initiative; the jolliest steamroller will not plant flowers.

WALTER LIPPMANN, "Routinier and Inventor," *A Preface to Politics*, 1914.

The history of America is a history of gigantic engineering feats and colossal mechanical construction.

LOUIS LOZOWICK, in Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm*, 1989.

Significant advances in science often have a peculiar quality: they contradict obvious, commonsense opinions.

S.E. LURIA, *A Slot Machine, A Broken Test Tube: An Autobiography*, 1984.

Everyone knows that in research there are no final answers, only insights that allow one to formulate new questions.

S.E. LURIA, *A Slot Machine, A Broken Test Tube: An Autobiography*, 1984.

[T]he world of science may be the only existing participatory democracy.

S.E. LURIA, *A Slot Machine, A Broken Test Tube: An Autobiography*, 1984.

Science, at bottom, is really anti-intellectual. It always distrusts pure reason, and demands the production of objective fact.

H.L. MENCKEN, *Minority Report: Notebooks*, 1956.

Isn't it strange that as technology advances, the quality of life frequently declines?

HARVEY MILK, speech, fund-raising meeting, 1977.

By his very success in inventing labor-saving devices, modern man has manufactured an abyss of boredom that only the privileged classes in earlier civilizations have ever fathomed.

LEWIS MUMFORD, "The Challenge to Renewal," *The Conduct of Life*, 1951.

What it is important to realize is that automation... is an attempt to exercise control, not only of the mechanical process itself, but of the human being who once directed it: turning him from an active to a passive agent, and finally eliminating him altogether.

LEWIS MUMFORD, "The Myth of the Machine," *The Pentagon of Power*, 1970.

For those of us who have thrown off the myth of the machine, the next move is ours: for the gates of the technocratic prison will open automatically, despite their rusty ancient hinges, as soon as we choose to walk out.

LEWIS MUMFORD, "The Myth of the Machine," *The Pentagon of Power*, 1970.

Modern technology has lost its magic. No longer do people stand in awe, thrilled by the onward rush of science; the promise of a new day. Instead, the new is suspect. It arouses our hostility as much as it used to excite our fancy. With each breakthrough there are recurrent fears and suspicion. How will the advance further pollute our lives; modern technology is not merely