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THE WHITE HOUSE

WASHINGTON

February 20, 1990

INFORMATION

MEMORANDUM FOR THE PRESIDENT

THROUGH: CHRISS WINSTON (w)

FROM: EDWARD McNALLY

SUBJECT: JOHNS HOPKINS UNIVERSITY SPEECH

I. SUMMARY

Attached are draft remarks for your speech at Johns Hopkins University's Commemoration Day ceremonies on February 22, 1990 in Baltimore, Md.

II. DISCUSSION

At 3:05 p.m. on Friday, February 22, 1990, you are scheduled to arrive onstage in Shriver Auditorium at Johns Hopkins University to address an audience of approximately 1,100 faculty and guests, including medical faculty. Few, if any, students will attend. You will speak after receiving an honorary Doctor of Humane Letters at approximately 3:45 p.m.

The speech (15 minutes, Teleprompter) discusses some current health issues, and acknowledges the role of Johns Hopkins as the first "modern" school of medicine in America. (Hopkins Hospital is currently celebrating its 100th anniversary.)

A note on the second joke on Page 1: You will be wearing an academic cap and gown.

McNally/Simon
February 21, 1990
Draft Four (E:HOP2)

PRESIDENTIAL REMARKS: JOHNS HOPKINS MEDICINE CENTENNIAL
SHRIVER AUDITORIUM, BALTIMORE, MD.
THURSDAY, FEB. 22, 1990, 3:45 P.M.

Thank you President Steven Muller [MULL-er]. \\ Just before coming out, Steven asked me to get one thing right. \\

The name of the University. \\\ It's **JOHNS** Hopkins. \\

He was given his great-grandmother's last name, as his first name. I told Steven: **"You don't need to explain family names to somebody called George Herbert Walker Bush."** \\\\

It's always good to see Governor Schaefer and Mayor Schmoke. Maryland's great Congresswoman -- my great friend -- Helen Bentley. And of course my fellow honorees, so many distinguished scholars and guests, here to honor both the founding of this outstanding, historic institution and the 100th anniversary of Johns Hopkins Medical Institutions. \\\

I'm pleased to be here. Although I was a bit nervous when I heard I'd be in a gown before a group of doctors. At least this one buttons in the front. \\\\\

Gathered in this auditorium are some of the best health care professionals in America. **And best in America means best in the world.**

You know, sometimes when we talk about "the best" of anything -- we add the phrase "that money can buy." But in medicine, it doesn't quite fit. There's an unease in the health care community that for all this nation's wealth, for all the

money put into the system, American medicine still faces unprecedented problems.

Medical malpractice. Uninsured families. An aging population. Cancer, heart disease, AIDS, drug addiction, Alzheimer's, mental illness. The price tag is staggering. Today, twelve percent of our gross national product goes to health care, and we rank number one in the world in per capita health care expenditures. Yet, we remain behind other industrialized countries in life expectancy. And in the developed world, we rank 22nd in infant mortality rates. \\

Clearly, we have our work cut out for us. And yet, because of institutions like Johns Hopkins, we can face these challenges with a sense of optimism and confidence. Those who think our medical problems today are unsolvable or solvable only by money ought to understand how far we've come.

For example, 19th Century hospitals were not so much centers of healing as of horror. And medical schools of the 1880's were deplorable and dangerous places. No labs. No patients. No questions permitted. Rookies became doctors after just 18 months, often without ever seeing the inside of a hospital.

Today's date marks Washington's birthday, but some scholars here today may recall his death: Diagnosed with a sore throat, the doctors bled him four times before he succumbed to its effects, thus depriving our young Nation of perhaps years of service from its most revered statesman.

In the primitive days of early medicine, change did come slowly. Until Johns Hopkins revolutionized the way medicine was taught for all time -- and launched a movement that brought America from medical backwater to world leader.

Hopkins' influence was completely out of proportion to its age or resources. It found its wealth at the source of America's wealth -- **in its ideas, in its people.**

New and powerful ideas. Dedicated and far-sighted people. Linking a medical school with a hospital. Teaching at the bedside. Bringing scientific research to medicine. Seeing what works.

In the final decade of the century, the Hopkins revolution in methodology helped lick the great killers of the last hundred years: Cholera. Tuberculosis. Smallpox. The list goes on.

Johns Hopkins demonstrates what one biomedical research establishment can do to change and improve health care in thousands of hospitals for millions of people.

Yet, in our country today, there is a growing sense of urgency ... a growing awareness that to make this country as healthy as it can be, all of us must accept a share of the responsibility: government, the health care profession and the American people themselves.

First, the federal government. In my State of the Union address, I asked Secretary of Health and Human Services Louis Sullivan to lead a Domestic Policy Council review of options on the accessibility, cost, and quality of America's health care

system. We are committed to health care policies that improve health care quality while restraining costs. For example, last December, I signed into law significant new Medicare physician payment reform; and we recently announced the first large-scale program to study medical treatment effectiveness.

But better, more affordable health care must also be more accessible. Expanded efforts to reduce infant mortality and expanded Medicaid eligibility to cover more women and infants are just two of the steps we are taking to help.

Yet, if American medicine is to continue to do the job, we must maintain our world leadership in medical research and development. **It was Hopkins that first isolated a substance that American government and medicine can always use: Adrenaline.** The clock is ticking. **And medical breakthroughs tomorrow depend on action today.** We must encourage basic biomedical research and develop new technologies that prevent disease and avoid the expense of long-term treatment. A good example of this was developed right here at Johns Hopkins, where the discovery of three types of polio virus made the polio vaccine possible. Ultimately, this "high-tech" solution -- the vaccine -- cost only a few cents per patient -- versus the tens of thousands of dollars that might be required for a lifetime of care in the old iron lungs.

This Administration has committed itself and this nation to the largest R and D budget in our history, including the biggest amount ever proposed for biomedical research. We want to double

the budget of the National Science Foundation and make the Research and Experimentation Tax Credit permanent. And we want to significantly increase the Eisenhower Math and Science Education Grants.

Of course, here at Hopkins you are the leading recipient of federal research dollars -- more than $500 million in the last fiscal year. You won that support the Johns Hopkins way -- the American way -- the same way your lacrosse team always makes the rankings: **By being the best**. By beating the competition in the marketplace of excellence, the marketplace of ideas.

But to keep American medicine the best in the world, individual health care professionals and institutions have an obligation to make our medical system both responsive and responsible.

You are the guardians of your profession -- its ethics and its quality. Your standards must be high and they must be enforced. The same sense of fiscal discipline that we must apply to government you must also apply to the medical world in a time of rising costs.

And I ask you, today, to avoid the understandable urge to practice "protective medicine" where the fear of litigation too often dictates treatment that is unnecessary. Where the threat of lawsuits threatens the very research that is so desperately needed today to save lives. In return, we've got to restore common sense and fairness to America's medical malpractice system. ///

I have directed the Domestic Policy Council to determine steps the federal government can take to help alleviate this serious situation. We've got to remember a simple truth: Not every unfortunate medical outcome is the result of poor medicine. You cannot make life risk-free. No risk means no progress. And that's not the American way.

One of Hopkins founders, Dr. William Halsted, was the gifted surgeon who introduced rubber gloves. In an age of surgical slashing, he used his scalpel carefully. Reducing shock and trauma. **A "kinder, gentler" surgeon, if you will.** \\\

But he was not without boldness. Halsted conceived and perfected a daring feat of surgery -- the radical mastectomy -- that to this day saves the lives of thousands of women afflicted with breast cancer. The procedure was unprecedented in its time. Yet in today's atmosphere of fear of malpractice -- probably would never even have been attempted.

This fear has not only hurt medical innovation and treatment. It's also hurt medical volunteerism. Many doctors used to give a day a week to the needy. And I'm convinced that, if not for the liability issue, many more would donate time today.

I also worry that the fear of malpractice limits the access of too many Americans in our rural areas to quality medical care -- particularly those with high risk cases. Often in America, whenever anything goes wrong, the response is automatic: "Someone's got to pay." And far too often, that "someone" is

determined by who has the resources, rather than by who has the responsibility. Tort reform is critical to solving the malpractice liability crisis.

But government and health care professionals alone cannot make this the healthy and productive country we want it to be. **America's health care system will be the best in the world only when every American cares about their own health.**

It is estimated that 40 to 70 percent of the causes of premature death in America are preventable deaths -- unnecessary deaths. Common sense tells us what that means. It's not complicated. Eat sensibly. Exercise. Wear seatbelts. Don't smoke and if you do smoke ... **stop.** Don't abuse alcohol -- and don't use illegal drugs.

We're not talking about lifestyle. We're talking about life. **And the best prescription for better health in America is a strong, daily dose of individual responsibility.**

This sense of responsibility is nothing new. Not far from here is the famous John Singer Sargent painting of the Founding Fathers of Johns Hopkins medicine. Sargent began by painting the four doctors, but wasn't satisfied with the composition. Something, he said, was missing. It came as an inspiration -- and he knocked down a studio wall to get the new props in. He added a huge Victorian globe, and above the globe a painting within a painting -- St. Martin giving his cloak to a beggar.

Sometime late at night, sometime during their tenure here, I suppose every weary Resident must pause before that canvas in the library, peering at the faces of these giants.

The globe should remind us of the global responsibilities of American medicine -- reaching out to relieve the terrible suffering of innocents like the AIDS babies in Romania, or the children of famine in Africa. And St. Martin's gesture should remind us of the special responsibilities of the medical community to reach out to those most in need -- to children, the disabled, the elderly and our poor.

We live in an age of miracles. Medical miracles as dramatic as the artificial heart. Everyday miracles as commonplace as the healing power of love.

I believe in miracles, and that wondrous accomplishments, wondrous breakthroughs, wondrous days are ahead. And I am privileged to be honored at one of the places where those wonders will continue to unfold.

Thank you for your warm greeting and this great honor. Godspeed you in your work. And God bless the United States of America.

# # #

McNally/Simon
February 16, 1990
Draft Three (B:HOPKINS)

PRESIDENTIAL REMARKS: JOHNS HOPKINS MEDICINE CENTENNIAL
SHRIVER AUDITORIUM, BALTIMORE, MD.
THURSDAY, FEB. 22, 1990, 3:30 P.M.

Thank you President Steven Muller. \\ Just before coming out, Steven asked me to get one thing right. \\

The name of the University. \\\ It's **JOHNS** Hopkins. \\

He was given his great-grandmother's last name, as his first name. I told Steven: **"You don't need to explain family names to a man named George Herbert Walker Bush."** \\\\

It's always good to see Governor Schaefer and Mayor Schmoke. Maryland's great Congresswoman -- my great friend -- Helen Bentley. And of course my fellow honorees, so many distinguished scholars and guests, here to honor both the founding of this outstanding, historic institution and the 100th anniversary of Johns Hopkins Medicine. \\\

I'm pleased to be here. Although I was a bit nervous when I heard I'd be in a gown before a group of doctors. At least this one buttons in the front. \\\\\

Gathered in this auditorium are some of the best doctors in America. **And best in America means best in the world.**

You know, sometimes when we talk about "the best" of anything -- we add the phrase "that money can buy." But in medicine, it doesn't quite fit. Increasingly, relentlessly, the role of money in health care has become less and less part of the solution -- and more and more part of the problem.

Medical malpractice. Uninsured families. An aging population. Cancer, heart disease, AIDS, drug addiction, Alzheimer's, mental illness. The price tag is staggering. Eleven percent of our gross national product goes to health care -- a figure that is ~~skyrocketing~~ increasing at a rate that neither the American family nor the American people can long afford.

1989 Stat. Abstract

HHS-HEFA George Sheeber 301-966-6507

Harry Rosenberg NCHS 301-436-8884

And it's not paying off. We rank number one in the world in per capita health care expenditures. But behind other industrialized countries in life expectancy. And just ~~18th~~ 22nd in the world in infant mortality rates. \\

And yet -- here at Johns Hopkins -- we can face these challenges with a sense of optimism and confidence.

Because those who think our medical problems today are insolvable -- or solvable only by money -- ought to understand how far we've come.

Hopkins Medical News 6/89 p. 33

For example, medical schools of the 1880's were deplorable, dismal, dangerous places. No labs. No patients. No questions permitted. Rookies became doctors after just 18 months, often without ever seeing the inside of a hospital. And hospitals were not so much centers of healing as of horror: 19th century medical treatment was often as likely to maim you as save you.

Reminds me of the frustrated administrator in the movie "Hospital" who finally bellows to his staff, "**Get this patient out of here before we kill him.**"

complete Book of US Presidents see file

Today's date marks Washington's birthday, but today's debate recalls his death: Diagnosed with a sore throat, the doctors bled him four times before he succumbed to its effects.

Change came slowly. Until Johns Hopkins burst upon the scene and changed the way medicine was taught for all time -- and launched a movement that brought America from medical backwater to world leader.

Hopkins' influence was completely out of proportion to its age or resources. It found its wealth at the source of America's greatest wealth -- **in its ideas, in its people.**

New and powerful ideas. Young and far-sighted people. Linking a medical school with a hospital. Teaching at bedside. Bringing scientific research to medicine. Seeing what works.

Here at Hopkins, in the final decade of the century, a revolution was launched that helped lick the great killers of the last hundred years: Cholera. Tuberculosis. Measles. Smallpox. Diphtheria. Typhoid and scarlet fever.

And here at Hopkins, in the final decade of this century, you can help launch a new revolution, a revolution that completes the promise of the American experiment -- equal opportunity for health and prosperity for all Americans.

A new revolution -- but many of the old rules still apply. One is that not every great medical innovation needs to cost a lot of money -- or even any money at all. C.P.R. -- Cardio-Pulmonary Resuscitation -- was developed at Hopkins when an electrical engineer made a chance observation. They say the

JHU fact sheet

Hopkins paper on C.P.R. may have saved more lives than any other medical manuscript in the past 100 years. C.P.R.'s simple and it's cheap, and it requires just two things: **Your hands**.

Today, some of the most expensive problems are some of the cheapest to prevent. Having defeated some of the world's most vicious diseases -- as one observer noted -- "We've killed all the wolves in the forest, and now the termites are eating us."

PHS 245-6867 Jim Brown

It is estimated that 50 to 70 percent of the causes of premature death in America are preventable deaths -- unnecessary deaths. Washington can't save you. But you can.

see article by Louis Sullivan

Common sense tells us what that means. It's not complicated. Eat sensibly. Exercise. Wear seatbelts. Don't smoke or abuse alcohol -- and don't use illegal drugs.

We're not talking about lifestyle. We're talking about life. **And the first prescription for better health in America is a strong, daily dose of individual responsibility.**

Often in America, whenever anything goes wrong, the response is automatic: "Someone's got to pay." **And far too often, that "someone" is determined by who has the resources, rather than by who has the responsibility.**

For example, we've got to restore common sense and fairness in America's medical malpractice system. Doctors who practice medicine according to their medical malpractice risk are victims just like their patients -- just like the taxpayer who foots the bill for escalating health care costs. And we've got to remember some simple truths: You cannot compensate every loss with money.

You cannot make life risk-free. No risk means no progress. And that's not the American way.

One of Hopkins founders, Dr. William Halsted, was the gifted and conservative surgeon who introduced rubber gloves. In an age of surgical slashing, he used his scalpel carefully. Reducing shock and trauma. Controlling bleeding. **A "<u>kinder</u>, <u>gentler</u>" surgeon, if you will.** \\\

<u>But he was not without boldness</u>. Halsted conceived and perfected a daring feat of surgery -- the radical mastectomy -- that to this day saves the lives of thousands of women afflicted with breast cancer. The procedure was unprecedented in its time. And in today's atmosphere of fear and malpractice -- probably would never even have been attempted.

This fear hasn't only hurt medical <u>innovation and treatment</u>. It's also hurt medical <u>volunteerism</u>. Many doctors used to give a day a week to the needy. And I'm convinced that, if not for the liability issue, many more would donate time today.

And I also worry that some of our neediest individuals don't have access to quality medical care -- particularly those in rural areas. In my State of the Union address, I asked Secretary of Health and Human Services Louis Sullivan to lead a Domestic Policy Council review of options on the accessibility, cost, and quality of America's health care system.

Individual responsibility and tort reform are two basic ways America can reduce costs and improve its leadership in the health care revolution. **Another way is equally <u>basic</u> -- encouraging**

basic biomedical research. To develop new, preventative technologies that will spare the expense of long-term treatment.

JHU fact sheet see file

A good example of this was developed right here at Johns Hopkins, where the discovery of three types of polio virus made the polio vaccine possible. Ultimately, this "high-tech" solution -- the vaccine -- cost only a few cents per patient -- versus the tens of thousands of dollars that might be required for a lifetime of care in the old iron lungs.

Dr. Henderson JHU 301-955-3540

Johns Hopkins demonstrates what one biomedical research establishment can do to change and improve health care in thousands of hospitals, using high-tech to replace high costs.

Facts about Hopkins brochure

On several fronts, there is a growing sense of urgency. **It was Hopkins that first isolated a substance American medicine needs a little more of today: Adrenaline.** The clock is ticking. **And breakthroughs tomorrow depend on action today.** That's why our Administration has called for prompt Congressional action on our proposals for investing in education -- investing in our children -- and investing in intellectual capital. Reforming product liability laws. Doubling the budget of the National Science Foundation. A record ~~increase~~ high in funds for R & D. Making the Research and Experimentation Tax Credit permanent. And the Eisenhower Education Grants for math and science would grow by 70 percent, to $230 million.

FY91 Budget p. 93-95

FY91 Budget p. 67-69

FY91 Budget p. 88

And of course, here at Hopkins you are the leading recipient of federal research dollars -- more than ~~$600~~ 500 million in the ~~current~~ last fiscal year. You won that support the Johns Hopkins way

Chronicle of Higher Ed. 11-29-89

JHU sport booklet

-- the American way -- the same way your lacrosse team always makes the rankings: **By being the best**. By beating the competition in the marketplace of excellence, the marketplace of ideas.

J.A.M.A. 6-2-89 p. 3060

Yes, our commitment is based on a new sense of urgency -- but also an old sense of responsibility. Not far from here is the famous John Singer Sargent painting of the Founding Fathers of Johns Hopkins medicine. Sargent began by painting the four doctors, but wasn't satisfied with the composition. Something, he said, was missing. It came as an inspiration -- and he knocked down a studio wall to get the new props in. He added a huge Victorian globe, and above the globe a painting within a painting -- St. Martin giving his cloak to a beggar.

Sometime late at night, sometime during their tenure here, I suppose every weary Resident must pause before that canvas in the library, peering at the faces of these giants.

The globe should remind us of the global responsibilities of American medicine -- reaching out to relieve the terrible suffering of innocents like the AIDS babies in Romania, or the children of famine in Africa. And St. Martin's gesture should remind us of the special responsibilities of the medical community to reach out to those most in need -- to children, women, minorities and our poor.

Newsweek 2-19-90 p. 63

Before closing, I'd like to note one other exciting development. In less than two months, a new shuttle flight will

carry the Hubble Space Telescope into orbit. The ground center for this mission is on this campus.

It's been called "the world's most extraordinary looking glass" -- 50 times the power of the largest telescope on Earth. **In its first minutes of operation, it will catapult the vision of humankind faster and farther than any leap since Galileo first gazed into the heavens. Back, perhaps, to the very beginnings of time. Forward, perhaps, to the very ends of the Universe.**

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I believe in miracles, and in the miracle of America. Wondrous accomplishments, wondrous breakthroughs, wondrous days are ahead. And I am privileged to be honored at one of the places where those wonders will continue to unfold.

Thank you for your warm greeting and this great honor. Godspeed you in your work. And God bless the United States of America.

# # #

McNally/Simon
February 15, 1990
Draft Two (B:HOPKINS)

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Sherry Gill JHU 301-338-7157

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I'm pleased to be here. Although I was a bit nervous when your invitation first arrived. **When I heard I'd be appearing before a group of doctors in a gown, I was relieved to find out it wasn't the kind they make you put on in the hospital.** \\\\

Gathered in this auditorium are some of the best doctors in America. **And best in America means best in the world.** The best -- deservedly the best -- that money can buy.

But increasingly, relentlessly, the role of money in health care has become less and less part of the solution -- and more and more part of the problem.

Medical malpractice. Uninsured families. An aging population. Cancer, heart disease, AIDS, drug addiction, Alzheimer's, mental illness. The price tag is staggering. Eleven percent of our gross national product goes to health care -- a figure that is skyrocketing at a rate that neither the American family nor the American people can long afford.

And it's not paying off. We rank number one in the world in per capita health care expenditures. But far behind other industrialized countries in life expectancy. Just 18th in the world in infant mortality rates. \\

And yet -- here at Johns Hopkins -- it's easy to face these challenges with a sense of optimism and confidence.

Because those who think our medical problems today are insolvable -- or solvable only by money -- ought to look back a mere 100 years.

Medical schools of the 1880's were deplorable, dismal, dangerous places. No labs. No patients. No questions permitted. Rookies became doctors after just 18 months, often without ever seeing the inside of a hospital. And hospitals were not so much centers of healing as of horror: 19th century medical treatment was often as likely to kill you as save you.

Complete book of U.S. Presidents see file

Today's date marks Washington's birthday, but today's debate recalls his death: Diagnosed with a sore throat, the doctors bled him four times before he succumbed to its effects.

Geo. Washington died 1799

Change came slowly. Until 90 years later, when Johns Hopkins burst upon the scene and changed the way medicine was

Hopkins Hospital founded 1889

taught for all time -- and launched a movement that brought America from medical backwater to world leader.

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It is estimated that 50 to 70 percent of the causes of premature death in America are preventable deaths -- unnecessary deaths. Washington can't save you. But you can.

Our grandmothers knew what that means. It's not complicated. Eat sensibly. Exercise. Wear seatbelts. Don't abuse tobacco or alcohol -- and don't use illegal drugs.

We're not talking about a lifestyle. We're talking about a life. **And the best prescription for better health in America is a strong, daily dose of individual responsibility.**

It's ironic to note the lunacy of those young Americans who work out, eat granola, check food labels to guard against artificial ingredients -- and then voluntarily ingest powerful, impure and illegal chemicals.

If a doctor prescribed a drug, even a legal drug, that was as impure and as debilitating as cocaine, they'd probably sue for malpractice.

And yes, medical malpractice is another problem that requires a fundamental change in attitude. Too often in America, whenever anything goes wrong, the response is automatic: "Someone's got to pay." **And far too often, that "someone" is determined by who has the resources, rather than by who has the responsibility.**

We've got to restore common sense and fairness in America's medical malpractice system. And we've got to remember some simple truths: You cannot compensate every loss with money. You cannot make life risk-free. No risk means no progress. And that's not the American way.

JHU fact sheet see file

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Our malpractice system hasn't only hurt medical <u>innovation</u>. It's also hurt medical <u>volunteerism</u>. Many doctors used to give a day a week to the needy. And I'm convinced that, if not for the liability issue, many more would donate time today.

And I also worry about the reduced access to medical care -- particularly in rural areas -- that excessive malpractice awards have caused.

Individual responsibility and tort reform are two basic ways America can reduce costs and improve its leadership in the health care revolution. **Another way is equally <u>basic</u> -- encouraging**

basic biomedical research. To develop new, preventative technologies that will spare the expense of long-term treatment.

A good example of this was developed right here at Johns Hopkins, where the discovery of three types of polio virus made the polio vaccine possible. Ultimately, this "high-tech" solution -- the vaccine -- cost only a few cents per patient -- versus the tens of thousands of dollars that might be required for a lifetime of care in the old iron lungs.

That's why we must invest in the future -- and use high-tech to replace high costs. And Johns Hopkins is a great example of what one biomedical research establishment can do to change and improve health care in thousands of hospitals.

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current fiscal year. You won that support the Johns Hopkins way -- the American way -- the same way your lacrosse team always wins: **By being the best**. By beating the competition in the marketplace of excellence, the marketplace of ideas.

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# # #

News and Information Services

The Johns Hopkins University
Whitehead Hall
Baltimore, Maryland 21218
(301) 338-7160

February 8, 1990

Mr. Bob Simon
Room 111
The White House
Washington, D.C. 20500

Dear Bob,

I understand from Sherry Gill, our director of special events, that you have already been provided with a wealth of background material on the Centennial of Johns Hopkins Medicine--which is appropriate given the theme of this year's Commemoration Day observances. However, as you plan the President's speech, you should be aware that Hopkins is distinguished internationally in a variety of other fields--and that mentions of some of these other highlights would be very well received by the Commemoration Day audience.

They are:

The University's historic role. Johns Hopkins opened its doors in 1876 as the first American university founded on the model of the great European--specifically German--universities. It was, therefore, the first true research university in America, concentrating on the advance of scholarship and the training of graduate students along with the provision of collegiate education to undergraduates. Today, the University has eight academic divisions, including the Schools of Arts and Sciences and Engineering, which are the principal undergraduate divisions, and the Peabody Conservatory of Music. For a full list see the blue brochure and the Facts booklet.

The University's research stature. Hopkins is the leading recipient of federal research dollars--more than $639 million in FY89. More than $175 million of that total supports research in the School of Medicine and the School of Public Health.

The University's international outreach. Our Paul H. Nitze School of Advanced International Studies in Washington supports a highly regarded center for European studies in Bologna, Italy, and a cooperative venture known as the Hopkins-Nanjing Center for Chinese and American Studies in Nanjing, China. The latter is persisting in a unique residential program at Nanjing University despite the massacre in Tiananmen Square of last June.

The University's space interests. Hopkins is known worldwide for space science research. This spring, our scientists will be heavily involved in two important missions. On April 19, a shuttle flight will carry the Hubble Space Telescope into orbit. The ground center for this mission--the Space Telescope Science Institute--is on this campus, along with a group of more than 100 PhD astronomers from the U.S. and Europe who are in charge of scheduling, collecting, storing, and analyzing data beamed back from the telescope. While there is, properly speaking, no center of the Universe, Baltimore will become

the world center of astronomy following this launch. (NOTE: I understand this Sunday's New York Times Magazine will have a gorgeous cover story on this enterprise. Please look for it.)

A subsequent shuttle mission in May will carry with it the Hopkins Ultraviolet Telescope, which detects UV rays normally screened by the atmosphere. Most excitingly for us, this mission will also include a Hopkins astronaut, research scientist Sam Durrance, who will deploy and operate the telescope as the shuttle zips around the earth. Unlike Hubble, HUT will come back with the shuttle.

The University's athletic teams. Along with medicine, Hopkins is probably best known for prowess in lacrosse, the ancient American Indian sport. Our campus is the home of the Lacrosse Hall of Fame, and the Hopkins "Blue Jays" have won more national lacrosse titles than any other school--seven since 1972. For the past three years, we have been a leader in exporting lacrosse to Japan, where it has become quite chic. We have had Japanese college-age youths on our campus each of the past two Augusts for lacrosse clinics. Johns Hopkins bumper stickers have sprouted in the streets of Tokyo.

In June of 1988, our men's baseball team--which is very competitive on a Division III level--played the first American-Soviet collegiate baseball game in Russia. The game coincided with the Reagan-Gorbachev summit and got a tremendous amount of international publicity. In October the Soviet team, from the Mendeleyev Institute of Chemical Technology, visited our campus in Baltimore and played the first Soviet-American baseball games here. That also was extremely well covered nationally and internationally.

The University's interests in public education. Hopkins supports several research enterprises that focus on improving the nation's schools. Our researchers study innovative ways of restructuring classrooms and enhancing students' performances. We are also well known for our Center for Talented Youth, which conducts annual searches to identify and nurture the nation's most gifted teenagers.

Enclosed is a tremendous wealth of material on Hopkins, probably more than you need, including our official history, Portrait of a University, our standard facts brochure, and press releases on most of the above topics. I am also enclosing copies of all the honorary degree citations including President Bush's, copies of the citations for this year's Society of Scholars inductees, and a copy of the Commemoration Day program in its current form. Please call if you need anything more. We look forward to working with you to make this speech a hit!

Sincerely,

Ron Sauder

Ron Sauder
Director

xc: Sherry Gill
Ross Jones

News and Information Services

The Johns Hopkins University
Whitehead Hall
Baltimore, Maryland 21218

Memorandum

to: Bob Simon / The White House BY FAX (202) ~~539-6095~~ 456-6218

from: Ron Sauder (301) 338-7160 Ron

date: 2/20/90

re: JHU Research Ranking

Here is a table from Chronicle of Higher Education that I think will provide ample documentation for you.

Please call if you need anything more.

The Chronicle of Higher Education

November 29, 1989 •

Fed Funding 5

FACT FILE: The Top 100 Institutions in Total Research-and-Development Spending for Fiscal 1988

	U.S. funds for research & development		Total funds for research & development	
	Amount	Rank	Amount	Rank
Johns Hopkins U. *	$509,009,000	1	$557,016,000	1
Stanford U. †	232,572,000	2	277,504,000	2
Cornell U. †	153,662,000	8	271,659,000	3
U. of Wisconsin, Madison	162,384,000	4	271,418,000	4
Massachusetts Inst. of Technology †	210,419,000	3	270,584,000	5
U. of Minnesota	119,789,000	14	252,027,000	6
U. of Michigan	160,854,000	5	250,169,000	7
Texas A&M U.	90,163,000	22	231,161,000	8
U. of California, Los Angeles	146,946,000	9	209,338,000	9
U. of California, San Diego †	159,778,000	7	200,472,000	10
U. of Illinois, Urbana-Champaign	109,633,000	18	197,393,000	11
U. of California, San Francisco	137,747,000	11	193,289,000	12
U. of Washington	160,261,000	6	190,735,000	13
Harvard U.	133,003,000	12	190,429,000	14
Pennsylvania State U.	106,020,000	19	188,444,000	15
U. of California, Berkeley	116,565,000	15	186,372,000	16
U. of Texas, Austin	89,982,000	23	172,608,000	17
Yale U.	132,952,000	13	162,188,000	18
Columbia U.	139,558,000	10	160,976,000	19
U. of Pennsylvania	115,080,000	16	159,218,000	20
U. of Arizona	73,309,000	31	155,464,000	21
U. of California, Davis	63,435,000	36	154,655,000	22
Ohio State U.	69,135,000	33	154,652,000	23
U. of Southern California	112,615,000	17	150,009,000	24
U. of Georgia	39,703,000	66	137,692,000	25
U. of Maryland, College Park	55,365,000	44	135,531,000	26
Georgia Institute of Technology	78,798,000	29	132,051,000	27
U. of Colorado	95,041,000	20	128,015,000	28
Purdue U.	64,163,000	35	118,797,000	29
Washington U.	88,843,000	24	117,829,000	30
Michigan State U.	49,771,000	51	116,320,000	31
North Carolina State U.	34,256,000	75	115,440,000	32
Louisiana State U.	35,578,000	72	114,698,000	33
U. of Rochester †	92,533,000	21	114,061,000	34
Duke U.	86,240,000	25	113,968,000	35
U. of Florida	54,785,000	45	107,177,000	36
U. of North Carolina, Chapel Hill	82,723,000	26	107,039,000	37
Baylor College of Medicine	60,825,000	39	106,814,000	38
Rutgers U.	29,204,000	81	105,150,000	39
Northwestern U.	54,245,000	46	102,755,000	40
U. of Tennessee System	43,108,000	62	101,869,000	41
New York U.	77,746,000	30	100,872,000	42
U. of Pittsburgh	72,462,000	32	98,609,000	43
U. of Chicago †	80,967,000	27	98,541,000	44
Carnegie Mellon U.	63,009,000	37	94,051,000	45
California Institute of Technology †	79,570,000	28	93,351,000	46
U. of Massachusetts	52,139,000	49	93,117,000	47
U. of Iowa	64,370,000	34	93,113,000	48
Virginia Polytechnic Inst. and State U.	33,771,000	76	89,955,000	49
U. of Connecticut	38,953,000	67	89,630,000	50
Oregon State U.	48,877,000	54	88,953,000	51
State U. of New York, Buffalo	60,097,000	40	87,635,000	52
Iowa State U. †	23,306,000	94	86,726,000	53
U. of Alabama, Birmingham	$62,369,000	38	$85,030,000	54
State U. of New York, Stony Brook	54,017,000	47	79,410,000	55
Case Western Reserve U.	59,078,000	41	77,303,000	56
Princeton U.	47,245,000	57	76,891,000	57
U. of Illinois, Chicago	40,260,000	65	75,922,000	58
U. of Utah	57,383,000	43	75,789,000	59
U. of Texas System Cancer Center	27,129,000	85	75,642,000	60
Yeshiva U.	58,823,000	42	75,383,000	61
U. of Virginia	47,482,000	56	74,572,000	62
Indiana U.	52,498,000	48	73,526,000	63
U. of Miami	48,971,000	53	70,783,000	64
U. of Texas Southwestern Medical Center Dallas	48,357,000	55	70,392,000	65
U. of Kentucky	27,724,000	82	69,003,000	66
Rockefeller U.	37,452,000	69	68,588,000	67
U. of Missouri, Columbia	20,170,000	101	66,365,000	68
U. of Hawaii, Manoa	38,560,000	68	64,278,000	69
Boston U.	51,918,000	50	61,505,000	70
New Mexico State U.	43,481,000	61	61,001,000	71
Emory U.	43,668,000	60	60,896,000	72
U. of Nebraska, Lincoln	25,448,000	89	60,786,000	73
Vanderbilt U.	44,646,000	58	60,591,000	74
U. of Cincinnati	35,986,000	71	60,479,000	75
U. of California, Irvine	42,894,000	63	60,100,000	76
Colorado State U.	44,600,000	59	59,369,000	77
Utah State U.	34,763,000	74	59,273,000	78
Woods Hole Oceanographic Institute	49,400,000	52	58,700,000	79
U. of Maryland, Baltimore	33,102,000	77	58,649,000	80
Oklahoma State U.	12,850,000	129	56,636,000	81
Tufts U.	41,953,000	64	54,225,000	82
U. of California, Riverside	16,672,000	112	52,983,000	83
Auburn U.	18,243,000	108	52,737,000	84
U. of Kansas	24,880,000	90	51,723,000	85
Washington State U.	21,361,000	100	51,319,000	86
Florida State U.	24,027,000	92	50,679,000	87
Wayne State U.	22,716,000	97	50,509,000	88
U. of Oklahoma	16,326,000	113	50,047,000	89
City U. of New York, Mount Sinai School of Medicine	32,852,000	78	49,727,000	90
Clemson U.	13,148,000	127	49,375,000	91
U. of California, Santa Barbara	36,205,000	70	46,598,000	92
Mississippi State U.	13,556,000	125	45,005,000	93
Georgetown U.	30,666,000	80	44,783,000	94
U. of New Mexico ‡	24,862,000	91	43,527,000	95
U. of Texas Health Science Center Houston	27,658,000	83	43,345,000	96
Kansas State U.	14,294,000	120	43,174,000	97
Virginia Commonwealth U.	31,150,000	79	42,951,000	98
Tulane U.	23,727,000	93	42,619,000	99
U. of Medicine & Dentistry of New Jersey	21,849,000	99	42,027,000	100
Total, 100 institutions	**$6,892,738,000**		**$11,101,756,000**	
Total, all institutions	**$8,164,801,000**		**$13,422,137,000**	

Note: Figures cover only research-and-development expenditures in science and engineering, and exclude spending in such disciplines as the arts, education, the humanities, law, and physical education.
Because some institutions have developed new methods to report their research expenditures more accurately, comparisons with earlier years may not be appropriate.

* Includes the Applied Physics Laboratory with $364 million in total and $360 million in federally financed research and development expenditures.
† Excludes research expenditures at university-associated federally funded research-and-development centers.
‡ Estimate.

SOURCE: NATIONAL SCIENCE FOUNDATION

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
OFFICE OF THE ASSISTANT SECRETARY FOR HEALTH

OFFICE OF COMMUNICATIONS
NEWS DIVISION
DIRECTOR: JIM BROWN
TELEPHONE: 202-245-6867
FAX NUMBER: 202 245-6608

DATE: 2/20/90

TRANSMISSION TO: Bob Simon (___ CALL FOR PICKUP AT: _____)

FAX NUMBER: 456-6218

FROM: Jim Brown

Number of pages: 4 + transmittal sheet

COMMENTS:

regarded as superficial. Its high points include a concise review of the epidemiology of malignant lymphomas that does not gloss over the inherent problems of epidemiologic studies and a difficult but mind-expanding presentation of the immune system in relation to lymphomas, based largely on the concept of the immune network described by Jerne. There are a very clear, linear exposition of the genetic and chromosomal aberrations relevant to malignant lymphomas and a detailed account of the histopathology and immunopathology of low-grade lymphomas, problematic only in the seemingly necessary use of mixed terminology that is confusing to the noninitiate. Included are a discourse on the biology of T-lymphocytic cancers and discussions of relatively recent concepts, such as Ki-1–positive lymphoma, lymphoma of mucosa-associated lymphoid tissue, and histiocytic cancers. The histopathology of large-cell lymphomas and the pathobiologic intricacies of Hodgkin's disease are not substantially addressed. Nevertheless, this book will be provocative for those at least slightly knowledgeable about the malignant lymphomas who wish to have a good "think" through the various intertwining fields that pertain to the study of these complex neoplasms. It is therefore unfortunate that the book contains a disturbing number of typographical errors, a few of which garble the meaning of the authors.

Douglas R. Schneider, M.D.
St. Elizabeth's Hospital
Boston, MA 02135

NOTICES

Notices submitted for publication should contain a mailing address and phone number of a contact person or department. We regret we are unable to publish all Notices received.

UNIVERSITY OF NEBRASKA MEDICAL CENTER

The following courses will be offered in Omaha, unless otherwise noted: "Cardiovascular Disease Prevention" (Snowmass, Colo., July 30–Aug. 2); "Current Controversies and Techniques in Congenital Heart Surgery" (Baltimore, Sept. 8 and 9); "Smith, Kline and French Digestive Diseases Symposium" (Sept. 20); and "Emergency Medicine Review" (Sept. 25–30).

Contact Univ. of Nebraska Medical Ctr., Cont Educ., 42nd and Dewey Ave., Omaha, NE 68105-1065; or call (402) 559-4152.

HEALTH POLICY ISSUES AFFECTING MEDICAL EDUCATION

The conference will be held in Chicago on Sept. 22. Deadline for registration is Aug. 10.

Contact American Board of Medical Specialties, 1 Rotary Ctr., Suite 805, Evanston, IL 60201-4889; or call (312) 491-9091.

AMERICAN ACADEMY OF FAMILY PHYSICIANS

The 41st annual scientific assembly will be held in Los Angeles, Sept. 18–21. Deadline for registration is Aug. 11.

Contact AAFP, 8880 Ward Pky., Kansas City, MO 64114-2797; or call (800) 274-2237 (natl.) or (816) 333-9700 (Mo.).

INTERNATIONAL SOCIETY OF LYMPHOLOGY

A symposium, entitled "AIDS, Other Immunodeficiency Disorders, and the Lymphatic System: Pathophysiology, Diagnosis, and Immunotherapy," will be held in Tokyo on Aug. 30.

Contact Dr. Marlys H. Witte, Univ. of Arizona Coll. of Med., 1501 N. Campbell Ave., Tucson, AZ 85724; or call (602) 626-6118.

BIOLOGY OF HEMATOPOIESIS

The international symposium will take place in Cambridge, Mass., Oct. 15–20. Deadline for registration is Sept. 1.

Contact Bernadette Stohlman-Trenholm, Stohlman Fdn., 736 Cambridge St., Boston, MA 02135; or call (617) 789-2494.

COOK COUNTY GRADUATE SCHOOL OF MEDICINE

The following courses will be offered in Chicago: "Specialty Review in Cardiovascular Disease" (Sept. 11–15); "Specialty Review in Endocrinology and Metabolism" (Sept. 11–15); "Specialty Review in Gastroenterology" (Sept. 18–22); "Specialty Review in Dermatology" (Sept. 18–22); and "Specialty Review in Critical Care Internal Medicine" (Sept. 25–29).

Contact the School, 707 S. Wood St., Chicago, IL 60612; or call (800) 621-6651 (natl.), (800) 621-6649 (Ill.), or (312) 633-2600 (local).

ROBERT WOOD JOHNSON FOUNDATION

Proposals for research, evaluation, and demonstration projects are now being accepted for "Changes in Health Care Financing and Organization"; the projects will examine major changes in the financing and organization of health services and will assess the impact of these changes on health care costs, quality, and access. Grant periods are flexible.

Applications are also being accepted for the "Program for Faculty Fellowships in Health Care Finance 1990." Application deadline is Sept. 20.

Contact RWJ Fdn., College Rd., P.O. Box 2316, Princeton, NJ 08543-2316; or call (609) 452-8701.

SPECIAL REPORT

SHATTUCK LECTURE — THE HEALTH CARE PRIORITIES OF THE BUSH ADMINISTRATION*

The timing of this lecture is appropriate. The nation has a new president and a new secretary of health and human services. Therefore, it is important to articulate the direction of the Bush administration's health care policies. Because the quality and cost of health care have become more visible and complex national issues, the challenges and opportunities facing the Department of Health and Human Services deserve careful scrutiny as never before.

In this lecture I would like to discuss five priorities of immediate concern. Undoubtedly, there are others of importance. But these five concerns present national health care challenges and opportunities for significant progress. The priorities are as follows: confronting the challenging problems of human immunodeficiency virus (HIV) infection in our population, finding ways to end illicit-drug abuse, ensuring access to high-quality health care for the poor and our minority citizens, restraining the escalating costs of health care, and developing financially feasible methods of providing long-term care for our elderly and infirm citizens. I know that these issues are of concern to you also.

HIV Infection

Let me turn first to the problem of HIV infection. The spread of this virus continues to take its toll on our nation. As of April 1, 1989, the Centers for Disease Control had reported that an estimated 1 to 1½ million Americans have been infected with the virus, more than 90,000 of our citizens have received a diagnosis of the acquired immunodeficiency syndrome

*Presented as the 100th Shattuck Lecture to the Annual Meeting of the Massachusetts Medical Society on May 6, 1989.

(AIDS), and more than 32,000 have already died. The Public Health Service warns that by the end of 1992 more than 360,000 Americans will have received a diagnosis of AIDS, and more than 260,000 will have died.

I wonder if we can adequately visualize that last figure. The tragedy of infection, illness, and death from this virus has already had a crushing impact on our national consciousness. In the next 3½ years the numbers will more than quadruple.

We have seen much progress in our programs of research, prevention, and education. Generally, the American people now know about the nature of the virus and how it is transmitted. However, despite an intense American and worldwide effort, there is still no vaccine and no cure. We cannot be satisfied until we have solved the puzzle of this virus. Our frustration may be described by the words of Herodotus: "Of all men's miseries, the bitterest is this — to know so much and to have control over nothing." Until a vaccine or a cure is discovered, we must continue to develop appropriate programs for education, prevention, and treatment. Potentially useful pharmaceuticals and vital information must be forthcoming.

As you know, the Food and Drug Administration has recently taken an important step to help Americans with HIV infection by allowing expanded distribution of the aerosol version of pentamidine. This drug, helpful in the prevention of life-threatening *Pneumocystis carinii* pneumonia, has not been formally approved by the FDA. However, we have allowed wider distribution in order to permit physicians and patients to assess the risks on a case-by-case basis.

During my tenure at the Department of Health and Human Services, we shall look for additional measures to ease the suffering and despair. I want our citizens with HIV infection to know that we are in this fight with them all the way. We are on their side, doing everything we can. We will not turn our backs.

Also, our commitment extends beyond those with AIDS. We must prevent the further spread of the virus. We have worked with the media and the entertainment industry to present the facts as we know them: we have presented messages in every medium — newspapers, magazines, comic strips, radio, television, and film. A brochure entitled *Understanding AIDS* was mailed to every home in the United States in an unprecedented action.

We must continue our efforts. One barrier that must be overcome is denial — the belief that "it can't happen to me." Infection can happen to anyone who engages in risky behavior.

We must target preventive programs to those in our society whose behavior exposes them to an increased risk of infection, including men with homosexual or bisexual contacts, who represent 62 percent of the total number of AIDS cases reported by the Centers for Disease Control, and men and women with a history of intravenous drug use, who represent 20 percent of the cases reported to date.

We must also ensure the development, dissemination, and evaluation of culturally relevant and sensitive programs of prevention that address the special problem of AIDS in blacks, who represent 26 percent of the adult AIDS cases and 53 percent of the pediatric cases, and Hispanic Americans, who account for 15 percent of the adult cases and 23 percent of the pediatric cases.

In addition, we should work to keep the issue of HIV infection from becoming politicized. The political process must be used to build a consensus that will keep the focus on public health and not let the discussion degenerate into a referendum on lifestyles, or separate along partisan divisions. We should remember that the HIV epidemic is a public health issue.

Discrimination against those infected with the virus is unacceptable. HIV infection cannot be spread by casual contact. There is no justified medical reason for discrimination. Fear and ignorance must be overcome, not accommodated.

Drug Abuse

Second, we must keep up our efforts to curb illicit-drug abuse. During the past eight years, we have made progress in generating awareness and resolve. President Bush will continue this fight.

But the cost of any attempt to reduce the demand for or the supply of illicit drugs will be staggering. There are no simple solutions, and the numbers are overwhelming — over 70 million Americans have tried illicit drugs, and some 6.5 million need treatment for drug abuse.

These figures do not give the complete picture. Illicit drugs are a direct threat to the health of the user. The use of marijuana, cocaine, and other drugs has been shown to result in disorientation, reduced motor functions, impaired memory, tachycardia, cardiac arrest, stroke, and many other health problems.

Besides, the user is not the only one involved. Illicit-drug use is not a victimless crime. Behind each person using illicit drugs we find a family threatened. We discover drug dealers, dishonest financiers, and other social parasites. Our homes, schools, and neighborhoods are terrorized. In the nation's capital and elsewhere, the death toll mounts as drug dealers literally battle for control of markets and turf.

The users and dealers will be with us for as long as we tolerate illicit-drug use. Too many in our society use drugs, and too many look the other way when family members, friends, coworkers, and neighbors use drugs. Intolerance and the end of social acceptance are vital components of any successful antidrug efforts in the future.

One important action is to increase the number of treatment slots available for drug users. The availability of treatment is vital for those who want to say no but cannot. The Department of Health and Human Services recently announced $75 million in grants to help drug treatment facilities expand their services in order to reduce or eliminate waiting lists. But we will

not have enough treatment slots unless we all pitch in. Increasing the availability of treatment will require a joint effort and financial support from the federal government, states, municipalities, and the private sector. We must work to eliminate state and local zoning restrictions that reduce the number of sites available for treatment centers.

We must devote more time and attention to the dangers of alcohol abuse and alcoholism. The price we pay in lives lost and economic costs is avoidable and unnecessary.

Consider the lives lost: in 1983, the most recent year for which complete statistics are available, 28,000 Americans died of cirrhosis of the liver, at least 50 percent of which was alcohol-related. Alcoholism and alcohol abuse have also been linked to cancer of the pharynx, larynx, and esophagus, to structural brain damage and loss of memory, and to fetal alcohol syndrome. At least one half of all homicides and a high proportion of accidental deaths and suicides are alcohol-related. Over 100,000 Americans lost their lives in alcohol-related fatalities from 1979 to 1983, and thousands more suffered serious, often permanent, injuries. The economic costs are also overwhelming: in 1983, alcoholism and alcohol abuse cost Americans an estimated $117 billion.

Certainly, we must focus more attention on the problem of alcoholism and alcohol abuse. Public tolerance for such problems must end. Alcoholism must be confronted and treated.

Health Problems of the Poor and Minorities

Third, we need to devote more financial support and attention to the health problems confronting blacks, other minorities, and the poor. Recently, Dr. Robert Blendon and a team of researchers at the Harvard School of Public Health, using data provided by the Department of Health and Human Services, found that blacks have on average a death rate 1½ times higher than that of whites. They found that blacks generally have less access to care, regardless of economic circumstances. The researchers cited many factors that may explain this difference, such as lifestyle, economic considerations, the availability of Medicaid, family circumstances, and an inadequate supply of black physicians.

Another disturbing report recently came across my desk. The department each year publishes *Health United States*, a compilation of health statistics. In our 1988 issue, we have just released the latest available figures on life expectancy. The good news is that in 1986 average life expectancy at birth was up to 74.8 years for the population as a whole. But for the second year in a row the life expectancy of black Americans declined, falling to 69.4 years in 1986, from 69.5 in 1985 and 69.7 in 1984.

In almost every category of mortality listed, the minority death rate is higher than that of the white population. Rates of infant deaths, neonatal deaths, and postnatal deaths are all twice as high among blacks as among whites. A greater percentage of minority members die of heart disease, cerebrovascular disease, and cancer as compared with the white population.

These issues must be addressed. One answer is an increased emphasis on health education and preventive care. Every dollar spent on immunizing small children against common infectious diseases can save up to $10 in medical treatment later on, and avoid needless illness and death.

Early detection and intervention, immunization, and behavioral change could significantly reduce the incidence of many of the leading causes of death and disability. It has been estimated that we could eliminate 45 percent of deaths from cardiovascular disease, 23 percent of deaths from cancer, and more than 50 percent of the disabling complications of diabetes.

Better control of fewer than 10 risk factors — such as poor diet, infrequent exercise, the use of tobacco, and alcohol and drug abuse — could prevent between 40 and 70 percent of all premature deaths, a third of all cases of acute disability, and two thirds of all cases of chronic disability.

We need to focus on homicide among youths, the second leading cause of death among all 15-to-24-year-olds in the United States. Homicide is the leading cause of death among black youths, and the rate of homicide among black men in this age group is seven times the overall national rate. This high rate of homicide is an intolerable health problem. It is clear that we need to develop programs to prevent this risk and to intervene wherever necessary.

The High Cost of Health Care

We all know that the high cost of health care is unacceptable. In 1987 health care cost the American people more than $500 billion — 11 percent of our gross national product. Some estimate that these costs will be over $600 billion in 1989.

Rising health care costs simply must be brought under control. As costs increase, more people are squeezed out of the health care market. For example, more than 37 million Americans are not covered by health insurance, mostly because of the high cost of the premiums. In addition, the more than 160 million Americans dependent on employer-sponsored health-insurance plans are also threatened by rising costs. Employers are finding that health care costs consume a large proportion of their gross income — more than 10 percent of gross income for some companies.

The repercussions are obvious. These rising costs make it difficult for companies to provide a health care plan. Their market share, competitiveness, and profits suffer. Many companies have reacted by cutting benefits and increasing the proportion paid by employee contributions. Some companies have even instituted preemployment screening programs.

There is some evidence that a large percentage of what we spend for health care does not buy needed

care or provide an increased measure of quality. Some have estimated that more than 25 percent of the money Americans spend on health care is wasted.

There are no easy answers to the problem of escalating health care costs. But the federal government can create counter-pressures for cost containment. This has worked in the past. The prospective payment system, implemented in 1983 together with diagnosis-related groups, demonstrated that costs could be contained if the proper incentives were offered. For instance, in the year before the introduction of diagnosis-related groups, the medical care component of the consumer price index was rising at an annual rate of about 8.7 percent. But by 1987 the medical care component was down to about 6.6 percent.

The success of health maintenance organizations has also demonstrated that competition and case management help to restrain the rate of inflation of health care costs. As a result of reforms introduced during the past eight years, over 1 million Medicare beneficiaries have chosen membership in health maintenance organizations.

Competition can help to preserve and even enhance the quality of care. Since 1983, a number of studies have shown that the quality of care in hospitals has not declined. A report in March 1989 by the Prospective Payment Assessment Commission, an independent panel established by Congress, found that there is no evidence of "substantial or systematic changes in the quality of care received by Medicare hospitalized patients since the implementation of [the prospective payment system]."

I realize that this conclusion must be greeted with some caution. There is much discussion and disagreement about the factors that should be analyzed in an evaluation of the quality of care. However, I join with those who argue for an expanded effort to judge the quality of medical care. As Secretary Otis Bowen noted in the Shattuck Lecture two years ago, "To measure quality, we must first be able to recognize it when we see it."

If there is any demonstration that the quality of care is diminished, we will take whatever steps are necessary to protect our citizens. Preservation and improvement of the quality of health care is a top priority.

Both Canada and the United Kingdom are confronting very serious and complex problems in the quality of their health care and in providing affordable access to care. Both health care systems are looking to the United States for expertise and solutions. A reasonable amount of competition and choice may offer them the best opportunity to preserve high-quality care.

Long-Term Care and Health Care for the Uninsured and Underinsured

Finally, we need to focus on the long-term care needs of our senior citizens. There will be 30 million more Americans over the age of 65 by the year 2030. About one fifth of those over 65 now require long-term care at some point during the year. If that percentage holds, the number requiring such care will triple by 2030.

Who will pay for this care? How shall we pay for this care? In 1985 the cost of institutional care was more than $35 billion. Over 50 percent of that cost was borne by individual patients and their families, and 43 percent by Medicaid. Only a small percentage was covered by private insurance.

Many have argued that this is primarily a federal responsibility. However, if that were the case, some estimates indicate that the cost to the federal government in the next few years could be between $30 billion and $50 billion.

Clearly, several options must be carefully explored. One possibility is for insurance companies to offer policies that can help people pay for this enormous expense.

Also, the private sector, including employers, insurance companies, nonprofit groups, and others must work in partnership with federal, state, and local governments to explore alternative and creative avenues for payment. Such a partnership would allow government to focus on its traditional role, helping those most in need, who have no resources to pay for private care.

In addition, care for the indigent must receive more careful study and a plan of action. As I have noted, more than 37 million Americans lack health insurance. More than 11 million of them make less than $10,000 a year. Federal, state, and local governments, insurance companies, and nonprofit groups must work together to find solutions.

Conclusion

During the Bush administration, the Department of Health and Human Services will address a wide variety of health and economic issues. Today I have mentioned five priorities: addressing HIV infection, stopping the use of illicit drugs, improving the quality of care for the poor and our minority citizens, restraining the escalating costs of health care, and providing more affordable long-term care for the elderly.

But these priorities do not exist in a vacuum. Rather, our work at the Department of Health and Human Services must complement and stimulate your own efforts. My discussion tells only part of the story. In Massachusetts and elsewhere, local and state governments, private organizations, state medical societies, churches, and many other groups are all trying to improve the human condition. I welcome your assistance. Together, we can make the words of Ralph Ellison come alive: "America is woven of many strands. . . . Our fate is to become one, and yet many."

Department of Health and Human Services
Washington, DC 20201

Louis W. Sullivan, M.D.

REMARKS BY

LOUIS W. SULLIVAN, M.D.

SECRETARY OF HEALTH AND HUMAN SERVICES

JOHNS HOPKINS CENTENNIAL

JUNE 7, 1989

BALTIMORE, MARYLAND

Mr Simon,

Bill Schambra asked me to forward these to you. Let me know if you need anything else.

Suzanne Callaway
245-7470

Dr. Muller, Dr. Heyssel, Dean Ross, Senator, Governor Schaefer, Mayor Schmoke, members of the Board of Trustees, members of the faculty, students, distinguished guests, ladies and gentlemen. Thank you for the honor and recognition you have given me with the award of an honorary degree from this outstanding, historic institution. I will treasure it always.

I bring you a special greeting from President Bush and our first lady, and his congratulations on this occasion of the centennial celebrations of Johns Hopkins University.

100 years ago a woman, Victoria, was queen of England and a Republican, Benjamin Harrison, was President of the United States. Today, a woman, Elizabeth, is queen of England and a Republican, George Bush, is President of the United States -- and the Johns Hopkins' tradition of excellence in the "synergistic balance of research, teaching, and patient care," as my friend and academic colleague, Dick Ross has stated it, continues.

Steve, it is an honor for me to participate in these centennial celebrations, to be with you and the many other friends and professional colleagues I have here at Johns Hopkins. My relationship with your institution goes back some thirty years to the Spring of 1959, when I was interviewed by Dr. Ivan Bennett, who was then chairman of the pathology department at Hopkins and who offered me a residency position here. I was a brash, young physician in the midst of making a decision between Boston and Baltimore for my residency training. I did not come to Johns Hopkins then, but that interview was the beginning of a relationship that has continued throughout my professional career as physician, researcher and educator. Today I have finally made it to Baltimore, to Johns Hopkins.

It would be remiss of me not to mention my deep personal and professional respect for Dr. C. Lockard Conley, former director of hematology; Dr. Samuel Charache, also a hematologist and professor of medicine; and Dr. Victor Mckusick whose genetic studies have been so important in advancing our understanding of many heritable disorders. Bob Heyssel, the President of the Johns Hopkins' health systems, is also an old friend and like me, is a former hematologist who has, in recent years, devoted himself to medical administration and policy, where he has become a leader for the nation.

But we have not gathered today, to sing the praises of my friends. As special as they are; as competent and bright as they are; they are among many who have contributed to the illustrious history of Johns Hopkins University and its medical institutions. We are here to celebrate 100 years of a special center of scholarship. And for 100 years Johns Hopkins has been able to attract and produce those elegant qualities of professional competence, care and service to one's fellow man that are demonstrated today through Muller, Heyssel, Ross, Conley, Charache, Mckusick, and the oncoming generation of physician-scientists here who are making their mark, such as Ben Carson, Levi Watkins and many more like them.

We have heard today, of the men and women who have made the name Johns Hopkins synonymous with excellence in health care, research and education. They were extraordinary people, committed, dedicated to their calling. So profoundly did they change the concepts of medical education in their day, that their ideas, their "synergistic balance" of research, teaching, and patient care, became the model for modern medical education.

Abraham Flexner released his classic study, "Medical Education in the United States and Canada," in 1910, only 21 years after the founding of the Johns Hopkins hospital. In his examination of the 148 medical schools in the United States and Canada, he found only one he could praise without reservation -- Johns Hopkins medical school.

Flexner's report had such a major impact that by 1925, the number of medical schools in this country had decreased to 80. In my home of Atlanta, there existed 5 medical schools when the Flexner report was issued. Between 1910 and 1915, three of those schools closed, the fourth merged with the fifth, and in 1915 it became affiliated with Emory University where it is today. The founders of Johns Hopkins had changed the face of medical education in the United States, forever.

The "Big Four", Drs. Osler, Welch, Halsted and Kelly rode across the landscape of medicine with the same authority and success as the "Four Horsemen of Notre Dame" displayed on the football field in South Bend. The "Four Horsemen of Johns Hopkins" may not live in the lore of the Irish bars of South Chicago, but their work, their dedication and commitment have saved the lives of thousands. They set standards of excellence in patient care, research and teaching for all physicians and scientists for years to come.

And then there was Vivian Thomas, who labored unceasingly as a research technician in the laboratories of Dr. Alfred Blalock, initially at Vanderbilt and later at Johns Hopkins. Vivian Thomas was Black. He had no degree. All he had was a mind of shining brilliance, dedication and commitment. With the assistance of Vivian Thomas, Alfred Blalock and Helen Taussig changed the field of surgery on the heart forever.

100 years of achievement, of dedication and commitment, this is the standard of Johns Hopkins. This is the standard of the institution which receives more federal dollars than any other university in the nation. Not by statute, but in the marketplace of competition for ideas, for research grants and contracts, through excellence, through quality. These awards are a tribute to the continued academic strength of Johns Hopkins university.

But where do we go from here? What will be the role of Johns Hopkins for the next 100 years?

How do we cope with this period of rapid change, of great stress and great tension we find in medicine and biology, in our health care system.

As a nation, we rank number one in the world in per capita expenditures for health care. Those expenditures consume more than 11 percent of our gross national product, and they continue to rise at an unsustainable rate, during a period of great pressure on our federal budget.

Yet, the United States lags far behind other industrialized countries in some basic health indices -- average life expectancy and maternal mortality. We have an infant mortality rate of 10.4 deaths per thousand live births, which ranks the U.S. 19th in the world by this measure.

Certain segments of our population lag unconscionably in health status and in access to health care. I refer, of course, to residents of our inner cities and some rural areas, to Blacks, to Hispanics, to Native Americans, and others who are not yet full participants in the American dream of equal opportunity and unlimited horizons.

A common thread we find running through all these groups is poverty, and all the baggage that goes with it -- low income, low educational attainment, high rates of illiteracy, crime, drug abuse, a growing AIDS epidemic and family disintegration. This adds up to limited opportunities and limited horizons for the children who grow up in such circumstances. These children are our future. Their limitations become the limitations of this country among the nations of the world.

What has this to do with Johns Hopkins today -- as you begin the celebration of your glorious centennial? Well, these are the complex and compelling issues with which we must deal as a society, today and tomorrow. These issues are an inextricable part of the fabric of our society. These issues must be our focus if we are to meet the challenges posed by our health care system, and realize the full potential of the American dream, the American creed.

The founders of this great medical center knew, the "Big Four" knew, that the activities of the health professions do not occur in a vacuum. They are influenced, for better or for worse, by a great many factors in our nation's environment and on our nation's social agenda. If the health professions are to continue their leadership role in our society, we must work together to find solutions to these corrosive problems which cloud our future as a nation and our productivity as a society.

Most of you here know the excitement, the challenge -- and the potential -- of the new biology, including the efforts to map the human genome, gene splicing for the development of new vaccines and other biologicals. You know of the many other marvels of our modern technology. You have contributed to many of our advances through your laboratory and clinical discoveries and the pre-eminence of your scientists.

We have the most powerful computers ever, for collecting the massive data coming out of clinics and laboratories, for organizing and analyzing it, storing it for later use, developing molecular models, operating our diagnostic and therapeutic instruments, even examining the physiological phenomena accompanying the thought processes in the human brain.

The magnificent imaging machines of our laboratories and clinics are giving us ever more detailed data of human biology and pathology. With these instruments, laboratory scientists and clinical investigators have set out on an exciting study of man and those beings with which he shares the planet earth.

Inspite of these great and wonderful biomedical discoveries which have advanced our scientific capabilities and our medical technology, we have not yet developed an effective strategy for bring the fruits of these efforts to the health problems of our entire population.

We must find ways to improve our efforts for health promotion and disease prevention; to keep people well, independent and productive. We must take these health maintenance messages to the poor, to our minority citizens and to the medically underserved in our rural areas and our inner cities. We must make our themes relevant by being culturally appropriate and sensitive to the ethnic and socioeconomic diversity in our population.

We must first stress the individual's increasing power and primary responsibility for maintaining his or her own health, through health promotion and disease prevention strategies. This will require greatly expanded efforts by the health professions in health education, health promotion and disease prevention. It will also require an active partnership with community-based organizations, with businesses, state and local governments and private organizations.

It has been estimated that some 50% to 70% of the causes of premature death in our nation could be avoided by successful implementation of health promotion and disease prevention programs.

Secondly, through research on the effectiveness of medical procedures in our therapeutic armamentarium, we must find out what works and discard that which does not. Our efforts to eliminate inappropriate utilization of medical procedures must continue, to avoid exposing our patients to unnecessary risks, discomfort and inconvenience, and to avoid wasteful spending. We must seek greater efficiencies from the health care system, which will affect hospitals, physicians and other professionals. The improvement in our medical practice standards will be impressive, and many billions of health care dollars will be saved annually.

As part of our cost containment efforts, we need to find ways to greatly decrease the waste of our health care dollars in malpractice litigation and the costly, defensive medical practices which this engenders. We must husband more of our health dollars for serving people rather than our bloated legal system.

Thirdly, as a compassionate society, we must address the disparate health status of the poor and our minority citizens, to which we previously alluded. We need better strategies to provide adequate, effective health services in our medically under-served inner cities and rural areas and to our poor and minority citizens. We are compelled to find ways to strengthen the family, to combat illiteracy, to prevent the disintegration of families and of our communities, which results in homelessness, crime, drug abuse, violence and other social ills.

These, too, adversely affect the health status of our citizens.

Fourthly, we must work together to find affordable ways to provide health insurance for our 37 million uninsured citizens. This will require the participation of federal, state and local governments, and the private sector, including businesses, philanthropic organizations and individuals. We need to encompass a diversity of approaches, with emphasis on local leadership to fit local conditions.

Finally, at the Department of Health and Human Services we are committed to maintaining and strengthening our biomedical research enterprize to find better treatment and/or cures for cancer, heart disease, AIDS, drug addiction, alzheimer's disease, diabetes, mental illness and the many other afflictions which still encumber us. Funds spent for research are an investment in a better future for man. Funds invested in research lead to dividends in improved health and in cost savings from our future health care budget. This has been powerfully demonstrated by the near eradication of poliomyelitis in the United States and by the elimination of smallpox from the world -- the latter project by the world health organization, in which your own Dr. Henderson had a leadership role.

This is a major challenge, a significant agenda for our nation's health care system and our health professions educational institutions. But for 100 years this university has been successfully meeting major challenges. For 100 years Johns Hopkins has led the way, has established benchmarks, has solved problems, has changed the face of medicine.

So when our challenges for the future are placed in proper framework, here in Baltimore, it isn't really so difficult or profound. Keep the "Synergistic balance", do what you have always done. Continue to be what this nation and the world know you to be, Johns Hopkins university a symbol of excellence, a setter of standards, a fountain of learning and a citadel of service to man.

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The HCFA's *Health Care Financing Review, Health Care Financing Program Statistics* and *Notes* series present data for hospitals and nursing homes as well as extended care facilities and home health agencies. These data are based on records of the Medicare program and differ from those of other sources because they are limited to facilities meeting Federal eligibility standards for participation in Medicare.

Data on patients in hospitals for the mentally ill and on mental health facilities are collected by the National Institute of Mental Health (NIMH) and appear in *Mental Health, U.S.,* the *Mental Health Statistics* reports, (series CN), and the Mental Health Statistical Note series.

Disability and illness.—General health statistics, including morbidity, disability, injuries, preventive care, and findings from physiological testing, are collected by NCHS in its National Health Interview Survey and its National Health and Nutrition Examination Surveys and appear in *Vital and Health Statistics,* series 10 and 11, respectively. The Department of Labor compiles statistics on industrial injuries (see Section 13). Annual incidence data on notifiable diseases are compiled by the Public Health Service (PHS) at its Centers for Disease Control in Atlanta, Georgia, and are published as a supplement to its *Morbidity and Mortality Weekly Report.* The list of diseases is revised annually and includes those which, by mutual agreement of the States and PHS, are communicable diseases of national importance.

Nutrition.—Statistics on annual per capita consumption of food and its nutrient value are estimated by the U.S. Department of Agriculture and published quarterly in *National Food Review.* Historical data can be found in *Food Consumption, Prices, and Expenditures,* issued annually.

Statistical reliability.—For discussion of statistical collection, estimation, and sampling procedures and measures of statistical reliability applicable to data from NCHS and HCFA, see Appendix III.

Historical statistics.—Tabular headnotes provide cross-references, where applicable, to *Historical Statistics of the United States, Colonial Times to 1970.* See Appendix IV.

NO. 135. NATIONAL HEALTH EXPENDITURES: 1970 TO 1986

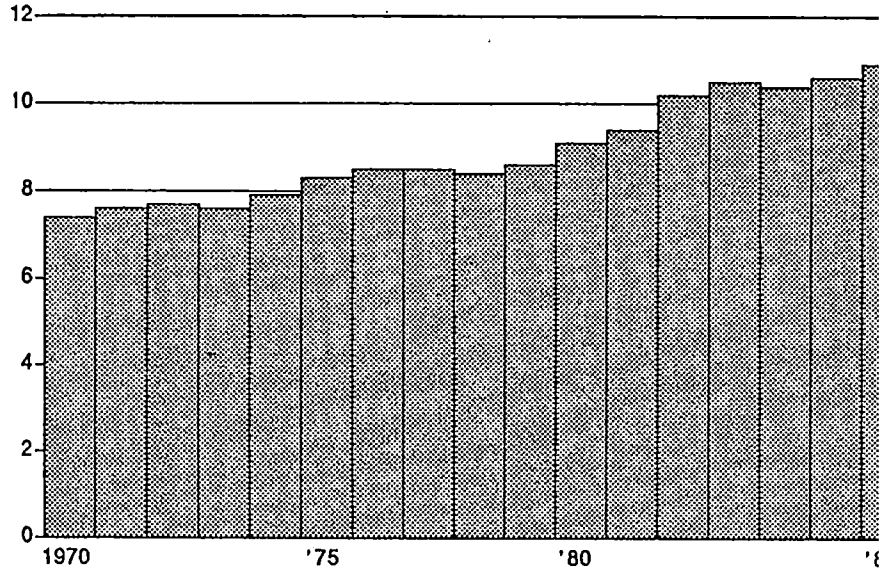
[Includes Puerto Rico and outlying areas]

YEAR	TOTAL [1]			HEALTH SERVICES AND SUPPLIES							
				Private				Public			
					Direct patient payments		Insurance premiums [4] (bil. dol.)	Total [5]		Medical payments	
	Total (bil. dol.)	Per capita (dol.)	Percent of GNP [2]	Total [3] (bil. dol.)	Total (bil. dol.)	Percent of total private		Total (bil. dol.)	Percent of total health exp.	Medicare (bil. dol.)	Public assistance (bil. dol.)
1970	75.0	349	7.4	44.7	26.5	59.3	16.9	24.9	33.2	7.5	6.3
1971	83.5	384	7.6	48.9	28.1	57.4	19.3	28.4	34.0	8.3	8.1
1972	94.0	428	7.7	55.3	30.6	55.4	22.2	32.1	34.1	9.1	9.1
1973	103.4	467	7.6	60.7	33.3	54.8	24.7	35.8	34.6	10.1	10.3
1974	116.1	521	7.9	65.8	36.2	55.0	27.9	42.9	36.9	13.1	12.1
1975	132.7	590	8.3	73.0	38.1	52.2	33.2	51.3	38.6	16.3	15.1
1976	150.8	665	8.5	84.5	42.0	49.8	40.4	57.3	38.0	19.3	16.9
1977	169.9	743	8.5	96.7	46.4	48.1	48.0	64.0	37.7	22.5	18.9
1978	189.7	822	8.4	106.6	50.7	47.6	53.6	73.3	38.7	25.9	21.1
1979	214.7	921	8.6	120.4	55.8	46.4	62.0	83.8	39.0	30.3	24.3
1980	248.1	1,054	9.1	138.7	63.0	45.5	72.6	97.5	39.3	36.8	28.1
1981	287.0	1,207	9.4	160.6	72.6	45.2	84.4	113.2	39.4	44.8	32.3
1982	323.6	1,348	10.2	182.2	79.6	43.7	98.7	127.1	39.3	52.4	34.9
1983	357.2	1,473	10.5	202.8	86.7	43.7	109.7	138.9	38.9	58.9	37.7
1984	391.1	1,597	10.4	224.7	98.4	43.8	121.5	150.8	38.6	64.4	38.3
1985	422.6	1,710	10.6	240.7	105.3	43.7	130.1	166.5	39.4	72.3	42.2
1986	458.2	1,837	10.9	262.5	116.1	44.2	140.7	179.5	39.2	77.7	45.8

[1] Includes medical research and medical facilities construction. [2] GNP=Gross national product; see table 688. [3] Includes other sources of funds not shown separately. [4] See footnote 3, table 136. [5] Includes other programs, not shown separately.

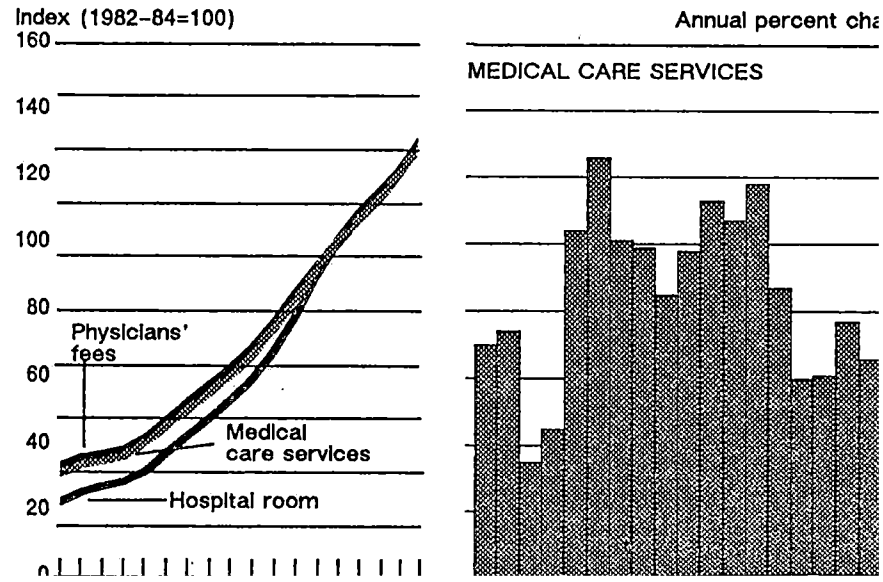
Source: U.S. Health Care Financing Administration, *Health Care Financing Review,* Summer 1987.

Figure 3.1
National Health Expenditures as Percent of Gross National Product: 1970 to 1986



Source: Chart prepared by U.S. Bureau of the Census. For data see table 135.

Figure 3.2
Indexes of Medical Care Prices: 1970 to 1987



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REMARKS

The attached is sent per a request from Shannon Calloway, HHS' Office of Public Affairs.

Health spending as a percent of the GNP is found on page 112.

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Health Care Financing Trends

The 1987 national health expenditure estimates are examined from different perspectives in the following two articles. In the first article, revised expenditure estimates for 1984-87 are presented. A breakdown of the type of services and products purchased is included, as well as the source of funds used to finance health care. In the second article, health care expenditure estimates are used to explore marginal analysis as a policy tool for understanding health spending in relation to our Nation's ability to finance that spending. The concept of marginal analysis is also used to examine selected periods that were relevant to health policy and the timing of public and private changes in health policy in the past.

National health expenditures, 1987

by Suzanne W. Letsch, Katharine R. Levit, and Daniel R. Waldo

Highlights

The Nation's health care bill topped $500 billion in 1987, an increase of 9.8 percent from 1986. Per capita spending increased to a level of $1,987, almost ten times the per capita spending of 1965. National health expenditures (NHE), as a share of the gross national product, continued its upward climb to 11.1 percent in 1987, increasing from 10.7 percent in 1986 and nearly double what it was in 1965 (Table 1).

Most of the growth in 1987 NHE was concentrated in spending for professional services. Expenditures for physicians', dental, and other professional services grew at rates faster than overall spending. Spending for the institutional services of hospital and nursing home care grew at slower than overall rates, reflecting the success of public and private hospital cost-control initiatives implemented in the early part of this decade.

National health expenditures

National health expenditures are divided into two parts: health services and supplies (expenditures related to current health care) and research and construction of medical facilities (expenditures related to future health care). Health services and supplies can be disaggregated into personal health care (the direct provision of care), program administration and the net cost of health insurance, and government public health activities.

Personal health care

Personal health care expenditures grew 10.2 percent to reach a level of $443 billion in 1987 (Table 2). This translates to an average of $1,758 per person. Personal health care includes hospital and nursing home care, services of physicians, dentists and other professionals, and miscellaneous other personal health care services, as well as purchases of prescription and nonprescription drugs and durable medical products.

Hospital and nursing home services which combine to represent institutional services, were the slowest growing personal health care expenditure categories during the last 4 years. Growth rates for hospital care spending reached a low of 6.3 percent in 1984, and have steadily increased to a rate of 9.1 percent in 1987. During this period, hospital care spending grew at a slower pace than total spending, reversing the trend of the period 1978-82 when hospital growth exceeded total spending growth.

Hospital care accounted for the largest share of personal health spending—$195 billion in hospital revenues representing 44 percent of personal health expenditures. Estimates of expenditures for hospital care include spending for both inpatient and outpatient hospital services. Spending for drugs and other services and supplies associated with hospital care, including services of hospital-salaried physicians, are also included in the hospital care category.

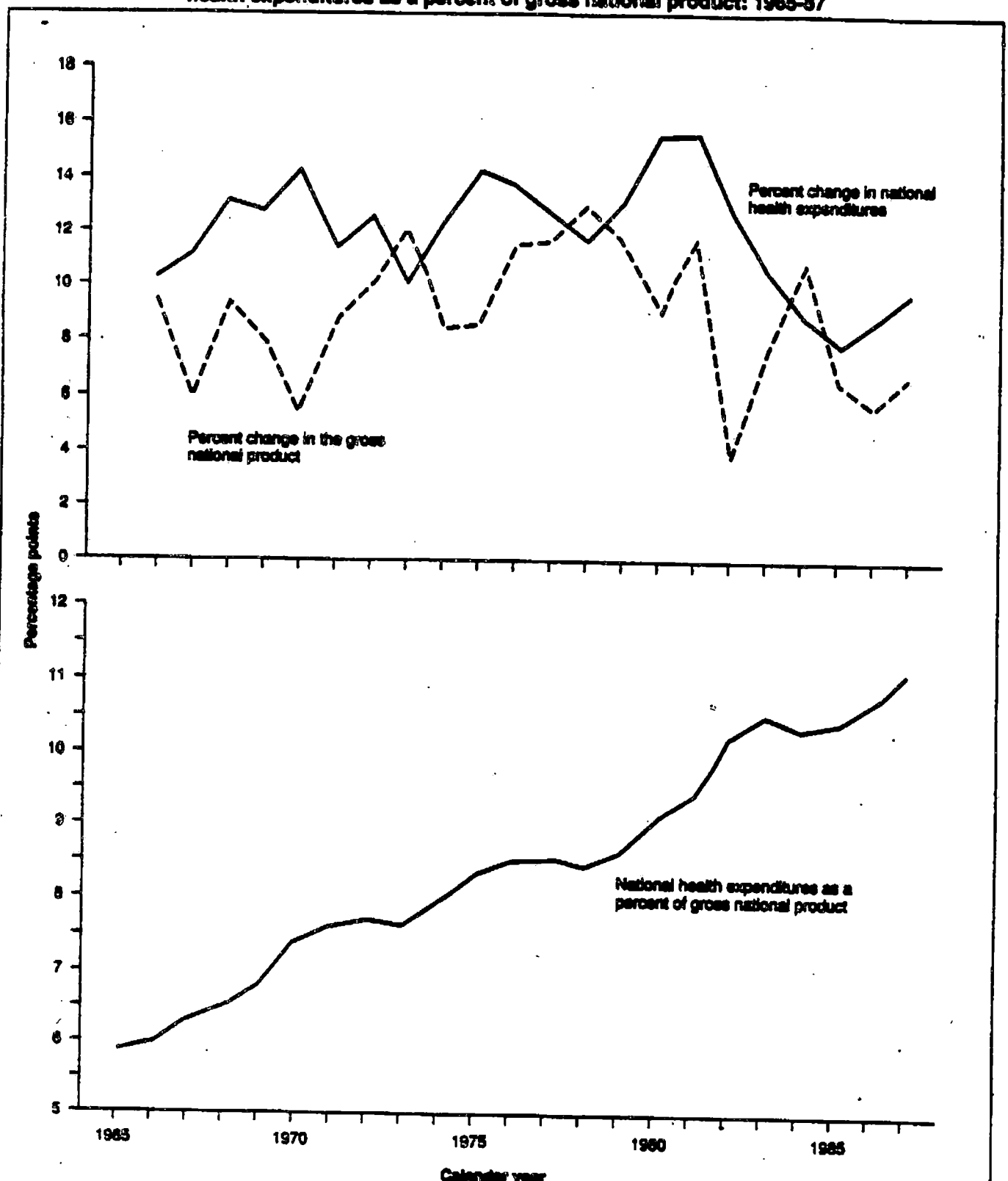
Nursing home care, the other component of institutional care, showed slower growth than personal health care during 3 of the last 4 years. Expenditures for nursing home care were $41 billion and accounted for 9 percent of personal health care spending. Spending increased only 8.6 percent from 1986, which was the slowest growth rate among all types of service.

While institutional spending showed the slowest growth in 1987, spending for the professional services of physicians, dentists, and other professionals showed the highest growth rates among types of service. In a trend opposite from hospital spending, growth in spending for physicians' services has outpaced that of health care since 1984. Expenditures for physicians' services, representing 23 percent of personal health spending, is the second largest personal health category. In 1987, $103 billion was spent for physicians' services, increasing 12.2 percent from 1986.

Spending for other professional services grew faster than any other type of service in 1987—as it has in every year since 1980. At a level of $16 billion, this category accounted for 4 percent of personal health care spending. Home health agency services are included in other professional services and account for much of the growth in this category. Also included are services rendered by chiropractors, private duty nurses, optometrists, podiatrists, among others.

Reprint requests: Carol Pearson, LI, 1705 Equitable Building, 6325 Security Boulevard, Baltimore, Maryland 21207.

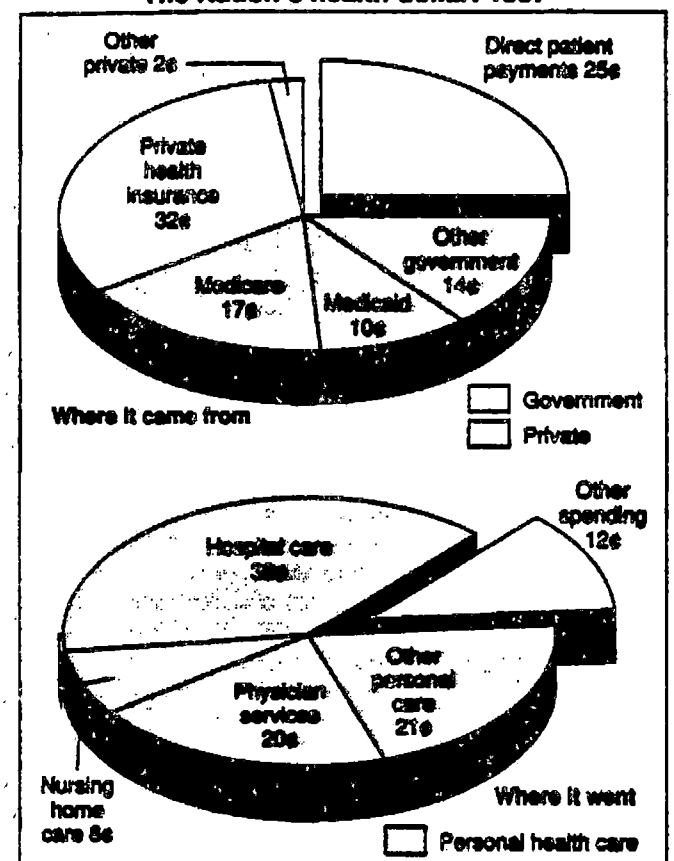
Figure 1
Percent change in national health expenditures and gross national product, and national health expenditures as a percent of gross national product: 1965-87



SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the Office of National Cost Estimates.

Spending for health generally has increased faster than has the gross national product (GNP), so that health expenditures are rising as a share of GNP.

Figure 2
The Nation's health dollar: 1987



SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the Office of National Cost Estimates.

During 1987, 75 percent of all health expenditures were paid by third parties—government, private health insurance, philanthropy, and business—and 88 percent of the spending went for personal health care.

Spending for dentists' services was $33 billion in 1987, increasing 11.1 percent from 1986. This category accounted for 7 percent of personal health spending.

The remaining 13 percent of the personal health care dollar was spent on drugs and medical sundries, eyeglasses and appliances, and other personal health care. Expenditures for drugs and medical sundries were $34 billion, increasing 8.9 percent from 1986. Expenditures for eyeglasses and appliances were $9 billion, increasing 9.3 percent from 1986. Other personal health care includes health care spending that does not clearly fit in any other category or is unspecified. This category is comprised mostly of public expenditures—the only private expenditures are for the operation of industrial onsite health services (industrial inplant). Other personal health care expenditures were $12 billion in 1987, increasing 12.2 percent from 1986.

Other health services and supplies

Program administration and the net cost of private health insurance (the difference between premiums earned and benefits incurred) amounted to $26 billion. This accounted for 5 percent of total spending, increasing 8.4 percent from 1986. Government public health activities amounted to $15 billion in 1987, increasing 7 percent from 1986. Public health activities are those functions carried out by Federal, State, and local governments to support community health, as opposed to care delivered to individuals.

Other national health expenditures

Expenditures for research were $9 billion in 1987, and include all spending for biomedical research and research in the delivery of health care by both private and public agencies. Research expenditures of drug and medical supply companies are not included in this category, but are included implicitly in the expenditure class in which the product falls. Spending for the construction of medical facilities was $8 billion in 1987, increasing 2.8 percent from 1986. The previous 3 years showed a decline in this category, which was a reaction to falling occupancy rates and overcapacity in community hospitals.

Financing personal health care

Third parties, through private health insurance plans and government programs, financed almost three-quarters of total personal health care in 1987. The remaining 28 percent was paid by direct patient payments in the form of coinsurance and deductibles, as well as out-of-pocket payments for uncovered services.

Within the general category of personal health, the share funded by third parties varied a great deal by type of care. The third-party share ranged from a high of 90 percent for hospital care to a low of 25 percent for drugs and medical sundries. Third parties paid for 74 percent of physician's services, 39 percent of dentists' services, and 51 percent of nursing home care.

Private health insurance plans paid an estimated $139 billion in benefits in 1987, which accounted for 31 percent of all personal health spending (Table 3). A large share of the spending for hospital care and physicians' services was paid for by private health insurance—37 percent of spending for hospital care and 43 percent of spending for physicians' services. The "other private" category of expenditures includes philanthropy and industrial inplant services and amounted to $5 billion in 1987.

Government programs spent $175 billion for personal health care services in 1987 (Table 4). Public programs financed 40 percent of all personal health care expenditures including 52 percent of all hospital care (Table 5), 31 percent of all physicians' services (Table 6), and 49 percent of all nursing home care

Table 1

National health expenditures aggregate, per capita, percent distribution, and annual percent change, by source of funds: Selected calendar years 1965-87

Item	1965	1970	1975	1980	1983	1984	1985	1986	1987
					Amount in billions				
National health expenditures	$41.9	$75.0	$132.7	$248.1	$357.2	$388.5	$419.0	$455.7	$500.3
Private	30.9	47.2	78.4	142.9	209.7	228.8	244.0	266.8	293.0
Public	11.0	27.8	56.3	105.2	147.5	159.6	175.0	188.9	207.3
Federal	5.5	17.7	37.0	71.0	102.7	112.0	123.1	132.8	144.7
State and local	5.5	10.1	19.3	34.2	44.8	47.7	52.0	56.1	62.7
					Per capita amount				
National health expenditures	$206	$349	$591	$1,055	$1,473	$1,587	$1,696	$1,827	$1,987
Private	152	220	340	608	865	936	987	1,069	1,164
Public	54	129	251	447	609	652	708	757	824
Federal	27	82	166	302	424	458	498	532	575
State and local	27	47	86	145	185	195	210	225	249
					Percent distribution				
National health expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Private	73.8	63.0	57.5	57.6	58.7	58.9	58.2	58.5	58.6
Public	26.2	37.0	42.5	42.4	41.3	41.1	41.8	41.5	41.4
Federal	13.2	23.6	27.9	28.6	28.8	28.8	29.4	29.1	28.9
State and local	13.0	13.5	14.5	13.8	12.5	12.3	12.4	12.3	12.5
					Average annual percent change from previous year shown				
U.S. population	—	1.0	0.9	0.9	1.0	1.0	1.0	0.9	0.9
Gross national product	—	7.8	9.5	11.3	7.6	10.8	8.4	5.8	6.8
National health expenditures	—	12.3	12.1	13.3	12.9	8.8	7.9	8.7	9.8
Private	—	8.8	10.1	13.4	13.6	9.1	6.6	9.3	9.8
Public	—	20.4	15.2	13.3	11.9	8.2	9.6	7.9	9.8
Federal	—	26.1	16.0	13.9	13.1	9.0	9.9	7.9	8.9
State and local	—	13.1	13.6	12.1	9.4	6.4	9.1	8.0	11.7
					Number in millions				
U.S. population[1]	204.0	214.8	224.7	235.2	242.4	244.8	247.1	249.5	251.8
					Amount in billions				
Gross national product	$706	$1,015	$1,598	$2,732	$3,406	$3,772	$4,015	$4,240	$4,527
					Percent of gross national product				
National health expenditures	5.9	7.4	8.3	9.1	10.5	10.3	10.4	10.7	11.1

[1]July 1 social security area population estimates.

SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the Office of National Cost Estimates.

(Table 7), and 20 percent of all remaining other personal health care services (Table 8).

Medicare, the largest public financer of health care, provided $81 billion in health care services to 32.4 million aged and disabled enrollees in 1987 (Table 9). The majority of Medicare benefits, 66 percent, purchased hospital care; another 27 percent bought physicians' services.

During the last 14 years with only one exception, Medicare spending for physicians' care grew 15 to 26 percent per year. Medicare expenditures for hospital care experienced similar growth rates for 1974-82, but that growth has slowed considerably in the last few years because of the implementation of the prospective payment system (PPS). As a result, Medicare's share of expenditures for physicians' services grew from 13 percent in 1974 to 22 percent in 1987; its share of expenditures for hospital care increased from 20 to 27 percent during the same period.

In 1987, the Medicaid program spent $49 billion, 11 percent of all personal health care, on behalf of low-income and medically indigent individuals. This program is jointly funded by Federal and State and local governments. Medicaid is heavily weighted towards institutional care: Program funds are evenly split (36 percent each) between hospital and nursing home care. The share Medicaid paid for nursing home care has decreased from 48 percent in 1980 to 44 percent in 1987; the out-of-pocket share for nursing home care has increased from 44 percent in 1980 to 49 percent in 1987.

Besides Medicare and Medicaid, there are many other public sources of financing for health care services. In 1987, these other programs paid $45 billion in personal health benefits, and represent 10 percent of personal health spending. This category includes such programs as the Veterans' Administration, Department of Defense, Indian Health Service, worker's compensation, and maternal and child health.

Financing other health expenditures

Of the $26 billion spent on program administration and the net cost of private health insurance, 25 percent was for public programs and the remainder for private programs (mainly private health

Table 2

National health expenditures aggregate and average annual percent change, by type of expenditure: Selected calendar years 1965-87

Type of expenditure	1965	1970	1975	1980	1983	1984	1985	1986	1987
	Amount in billions								
National health expenditures	$41.9	$75.0	$132.7	$248.1	$357.2	$388.5	$419.0	$455.7	$500.3
Health services and supplies	38.4	69.6	124.3	236.2	341.8	372.7	403.4	439.3	483.2
Personal health care	35.9	65.4	117.1	219.7	314.7	340.1	368.3	401.6	442.6
Hospital care	14.0	28.0	52.4	101.6	146.8	156.1	166.7	178.4	194.7
Physicians' services	6.5	14.3	24.9	46.8	68.4	74.4	81.4	91.6	102.7
Dentists' services	2.8	4.7	8.2	15.4	21.7	24.6	27.1	29.6	32.8
Other professional services	1.0	1.6	2.6	5.7	9.3	10.8	12.4	14.1	16.2
Drugs and medical sundries	5.2	8.0	11.9	18.8	24.5	26.5	28.5	31.3	34.0
Eyeglasses and appliances	1.2	1.9	3.2	5.1	6.2	7.0	7.8	8.7	9.5
Nursing home care	2.1	4.7	10.1	20.4	29.4	31.6	34.7	37.4	40.6
Other personal health care	1.1	2.1	3.6	5.9	8.3	9.0	9.8	10.7	12.0
Program administration and net cost of private health insurance	1.7	2.6	4.0	9.2	17.1	21.7	22.6	23.9	25.9
Government public health activities	0.8	1.4	3.2	7.3	9.9	11.0	12.5	13.8	14.7
Research and construction	3.5	5.4	8.4	11.9	15.4	15.8	15.6	16.4	17.1
Research[1]	1.5	2.0	3.3	5.4	6.2	6.9	7.5	8.3	8.8
Construction	2.0	3.4	5.1	6.5	9.2	8.9	8.1	8.0	8.3
	Average annual percent change from previous year shown								
National health expenditures	—	12.3	12.1	13.3	12.9	8.8	7.9	8.7	9.8
Health services and supplies	—	12.6	12.3	13.7	13.1	9.0	8.2	8.9	10.0
Personal health care	—	12.8	12.4	13.4	12.7	8.1	8.3	9.0	10.2
Hospital care	—	14.9	13.4	14.2	13.0	6.3	6.8	7.0	9.1
Physicians' services	—	11.1	11.7	13.4	13.5	8.8	9.3	12.6	12.2
Dentists' services	—	11.1	11.6	13.3	12.1	13.4	10.2	9.0	11.1
Other professional services	—	9.1	10.4	16.8	17.9	16.0	14.6	13.4	15.2
Drugs and medical sundries	—	9.1	8.3	9.4	9.3	8.1	7.6	9.9	8.9
Eyeglasses and appliances	—	10.7	10.1	9.9	7.1	13.0	10.3	11.6	9.3
Nursing home care	—	17.8	16.4	15.2	13.0	7.7	9.6	7.8	8.6
Other personal health care	—	12.5	12.6	9.5	12.1	7.3	9.3	9.5	12.2
Program administration and net cost of private health insurance	—	10.1	7.2	18.1	23.1	26.4	4.1	6.0	8.4
Government public health activities	—	11.9	17.2	18.2	10.9	10.2	14.4	9.6	7.0
Research and construction	—	9.0	9.2	7.3	8.8	2.4	-1.0	4.9	4.5
Research[1]	—	5.4	11.1	10.3	4.2	12.1	9.2	10.4	6.2
Construction	—	11.4	8.1	5.1	12.4	-4.1	-8.9	-0.3	2.8

[1]Research and development expenditures of drug companies and other manufacturers and providers of medical equipment and supplies are excluded from "research expenditures," but they are included in the expenditure class in which the product falls.

SOURCE: Health Care Financing Administration, Office of the Actuary: Data from the Office of National Cost Estimates.

insurance). Government public health activities are financed by Federal (11 percent), and State and local governments (89 percent). An example of Federal government public health would be the Centers for Disease Control in Atlanta that targets diseases rather than beneficiary populations. Activities of State and local health departments comprise most of the State and local public health programs.

The Federal government financed the largest amount for research, with funds totaling $7 billion, most of which was spent by the National Institutes of Health. Of the $8 billion spent on construction of medical facilities in 1987, 32 percent came from public sources, and the remainder was financed by private sources.

Acknowledgments

This article was prepared in the Office of National Cost Estimates under the general supervision of Ross H. Arnett, III, Director. The authors are grateful to members of the office staff who assisted in the assembling of data and the preparation of estimates.

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January 11, 1990

President George Bush
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20501

Dear George:

Bart, Zandy, and I deeply appreciate your wonderful invitation to the White House. We thoroughly enjoyed the visit and the opportunity to see you. And now Sister Jean tells me she saw you again - last Sunday - on the occasion of the David Donald lecture in the White House on Abraham Lincoln.

I do hope we will all see you a third time - in Baltimore - and I am writing on behalf of the Johns Hopkins University (of which I am a Trustee and former Board Chairman) to reissue an invitation to speak.

The date - February 22, 1990 - will be one of the most important in the one hundred year history of the University. It commemorates the 100th Anniversary of the Hopkins Medical School and, of course, medical people - world wide - will assemble for the event.

The time and details for this Commemoration Day occasion are outlined in President Steve Muller's attached invitation - which is being processed by your associates.

But the time is getting close, and it would be helpful for us to know whether there is a 100%, 90%, or a 10% chance.

This is a world event for medicine and for your Eastern Seaboard supporters. And all involved in education and in medicine, all Marylanders, and all the Harveys, do hope you will accept.

With best personal regards,

Sincerely,

Robert D.H. Harvey

RDHH/dh
Encl.

The Johns Hopkins University

Steven Muller
President

July 11, 1989

President George Bush
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20501

Dear Mr. President:

It is my great pleasure and privilege, on behalf of The Johns Hopkins University, to invite you to give the principal address at the University's Commemoration Day Ceremonies in Baltimore on the afternoon of February 22, 1990. Please let me add that it would also be our intention on this occasion to award you the degree of Doctor of Humane Letters honoris causa.

Commemoration Day marks the opening of the University in 1876 -- as you may know, the University was established with the bequest of Mr. Johns Hopkins and was founded as the first true university in the United States in the sense of being committed explicitly to advanced research and the award of the doctorate. The many distinguished colleges that already existed in America -- including Harvard and Yale -- became research universities only after the founding of Johns Hopkins, which also became the model for American medical education.

During the 1989-90 academic year, we are celebrating the Centennial of Johns Hopkins Medicine. As you know, the Medical Institutions are considered to be among the world's premier medical institutions and are credited with such legendary achievements as the first use of rubber gloves in surgery and the discovery of cardiopulmonary resuscitation (CPR). It was also here that medical education, patient care, and research were first united to form the scientific approach to medicine and public health which we take for granted today. In addition, this country's preeminence in biotechnology owes much to Johns Hopkins.

The importance of Johns Hopkins to American medicine and public health is being marked in several ways during this Centennial year. At the Inaugural Ceremony on June 7, Secretary Louis Sullivan gave an extraordinary keynote address which presented a thoughtful vision for this country's future health care needs. On the same occasion, Postmaster General Anthony Frank unveiled a stamp honoring Mr. Johns Hopkins. In addition, the Journal of the American Medical Association accorded us the rare honor of publishing an entire issue devoted to Johns Hopkins.

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All of us were disappointed that it was not possible for you to be present at the Inaugural Ceremony on June 7, and we hope very much that you will agree to deliver the principal address at the Commemoration Day Ceremonies on February 22, 1990. This would be a marvelous opportunity for you to express your support of American health care and medical research as well as to emphasize our country's leadership in medicine and public health.

On behalf of the Trustees of The Johns Hopkins Institutions, please let me say what a great honor it would be to have you join us for the celebration of the founding of The Johns Hopkins University and the Centennial of Johns Hopkins Medicine. We would be truly honored by your presence on February 22, and we hope that this early invitation may win your favor and your affirmative response.

With great respect and high regard,

Sincerely,

Steven Muller

SM/cf

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SPECIAL ISSUE: THE MEDICAL CENTENNIAL

Johns Hopkins

MAGAZINE JUNE 1989 INCORPORATING HOPKINS MEDICAL NEWS

A Healing Vision

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Diverse views are presented and do not necessarily reflect the opinions of the editors or official policies of the university.

EDITORS' NOTE

When American Medicine Changed

Why this centennial matters

The five people on this magazine's cover never posed for a group portrait—as did the "Big Four" original Hopkins physicians—but they should have. For one thing, they represent the institutions and groups that came together 100 years ago to found Johns Hopkins medicine: the university (Daniel Gilman), the hospital (John Shaw Billings), researchers (William Welch), nurses (Isabel Hampton), and doctors (William Osler).

Even more important, they represent some of the most powerful ideas that together distinguished medicine here from anywhere else in this country: linking a medical school with a hospital, reforming nursing education, learning at the bedside, bringing scientific research to medicine, and applying that research to prevent disease. Each of these principles helped shape the others.

Not all of these ideas were original to Hopkins. But never before had they been so successfully combined in research, education, and patient care. Hopkins became a model and training ground for medicine throughout the country.

Even so, is one institution's founding really worth all this attention? Well, it reformed medical education, and therefore practice. It revolutionized medical research, and thus knowledge. It launched a movement that turned America from a medical backwater into a world leader. In short, it made possible many of the miracles of modern medicine that we now take for granted until our lives depend on them.

That's why what happened 100 years ago is significant, and why the centennial is worth celebrating.

It would have been nice to continue the story—to cover all 100 years of Hopkins medicine. To do justice to the early greats, we were able to manage only a tip of the hat to the later ones, plus a modern-day perspective on it all. As our "100 Years Later" boxes tend to show, many in the institution are looking to approach today's problems as the founders would have.

The pieces are presented in mostly chronological order, although they may be read in any. We tried to present these achievements not as the result of grand forces, but of people struggling—frailties, arguments, mistakes, and all. We tried to tell the stories with as much immediacy as possible while still being faithful to the historical record. We hope these rightfully stately figures come alive.

It was only fitting that such a project bring together for their first joint issue two fine publications, *Johns Hopkins Magazine* and *Hopkins Medical News* (silver and bronze medalists in this year's university magazines competition of the Council for the Advancement and Support of Education). This has allowed us to produce a bigger and better magazine than either publication could have done on its own.

But this issue would have been impossible without the help of many others at Hopkins. Elaine Freeman, Joann Rodgers, Ghita Levine, Maria Esquela, and the rest of the Medical Institutions' Office of Public Affairs were there when we needed them. Gary Lees and Ranice Crosby at the Department of Art as Applied to Medicine made possible our piece on Max Broedel. Gerard Shorb, Mary Garofalo, and others helped us do research at the Alan Mason Chesney Medical Archives, to which the photographs used in this magazine belong (unless otherwise noted).

Above all, we are indebted to the authors of the new two-volume history of Hopkins medicine, *A Model of Its Kind*, A. McGehee Harvey, Gert Brieger, Susan Abrams, and Victor McKusick, as well as their publisher, Johns Hopkins University Press. They have freely given advice, advance access to their material, and much of the information and inspiration for this issue.

Our thanks to them all, to the others we have not named, and to the many advertisers who chose to be a part of the centennial and made this special issue possible.

—Alan Sea and
Janet Farrar Worthington



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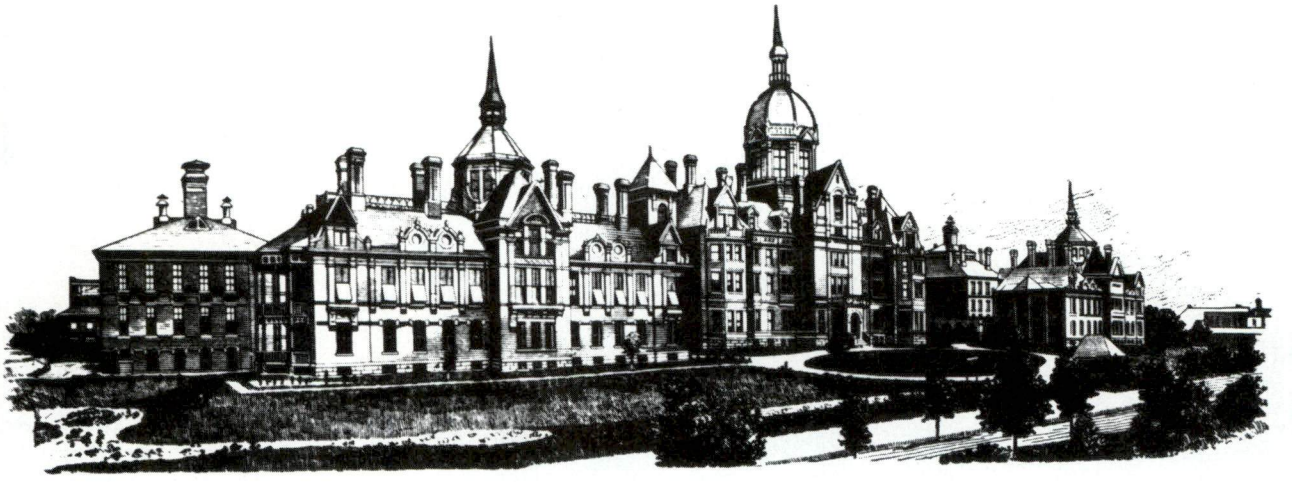
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ESSAY

COVER

Five of the figures who converged at Hopkins a century ago to change the course of American medicine: Standing in the administration building rotunda (from left) are hospital designer John Shaw Billings and nursing superintendent Isabel Hampton. Seated are medical school Dean William Welch, university President Daniel Gilman, and physician-in-chief William Osler. Illustration by Julian Allen.



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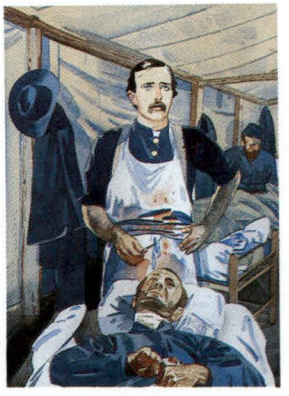
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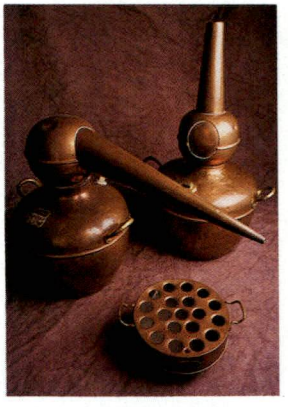
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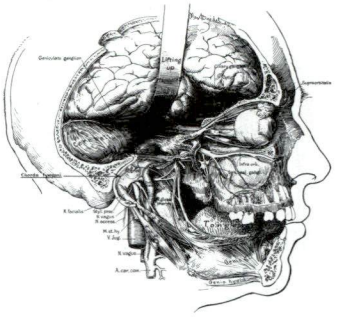
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their lives to enriching
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Another Chinese-born optimist

I enjoyed reading the article "China Lost and Found" by Susan L. Crowley in the April issue. Like Doak Barnett, I was born and raised in Shanghai, which I left in 1950 and returned to in 1972. Since then I have been back to China seven more times for visits to different parts of the country, including the sandy deserts of Urumqi and the windy grasslands of Inner Mongolia that Barnett visited.

China reaped benefits from both "liberation" in 1949, when the People's Republic of China was founded. and "liberalization" in 1979, when the Maoist era ended. Like Barnett, I am optimistic about China's future and believe China's forward momentum into the modern world is unstoppable in spite of the recent ups and downs.

Like her communist neighbor, the Soviet Union, China is undergoing transformation. Unlike Mikhail Gorbachev, who pushed for political reform in Russia, Deng Xiaoping devoted his energy to economic reform in China. In a country like China, where one quarter of the world population lives and works, it is far more important to be economically more prosperous than to be politically more sophisticated. You have to feed the mouth before the brain.

Tsung O. Cheng, MD
PROFESSOR OF MEDICINE
George Washington University

Applause for April

I want to commend you and the rest of the staff on the recent trend toward making the magazine of greater interest to a wider readership. I thought the book review "America's Country Editor," "Dangerous Obsessions" [the profile of writer Steven Dixon], and especially "China Lost & Found" in the April *Johns Hopkins Magazine* were particularly well done. . . . I hope that this trend will continue. . . .

Richard C. Dalsemer
Carmel Valley, California

TAs and tuition

Two items in the February issue caught my eye and, in juxtaposition, raised my ire. On page 50, I read to my amazement that lack of English competency is a serious problem among foreign teaching assistants at Hopkins. I was appalled to learn that there were departments at my alma mater so irresponsible as to put in front of a class anyone so deficient in rudimentary commu-

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It has been said that a drug that helps solve a problem is worth paying for, but one that does not help is of little or no value. As a practical matter, the efficacy of any medical treatment cannot be separated from considerations of cost. A socially responsible manufacturer must care about the patient's pocketbook as well as the patient's health.

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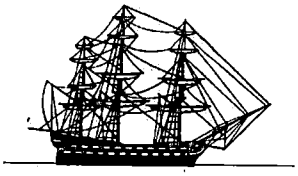
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nication skills. Someone should inform the respective chairmen that undergraduates are at Hopkins to get an education and not merely to serve as a "cash cow" to finance graduate studies.

Two pages further on, I read that tuition at Hopkins is due to rise to $14,000. For that kind of money, instruction in good English is not a privilege, but a fundamental right for the student and a basic obligation of the departments. No teaching assistant should be learning English as part of his on-the-job training.

JOHN GORMAN PHD '67
MIAMI, FLORIDA

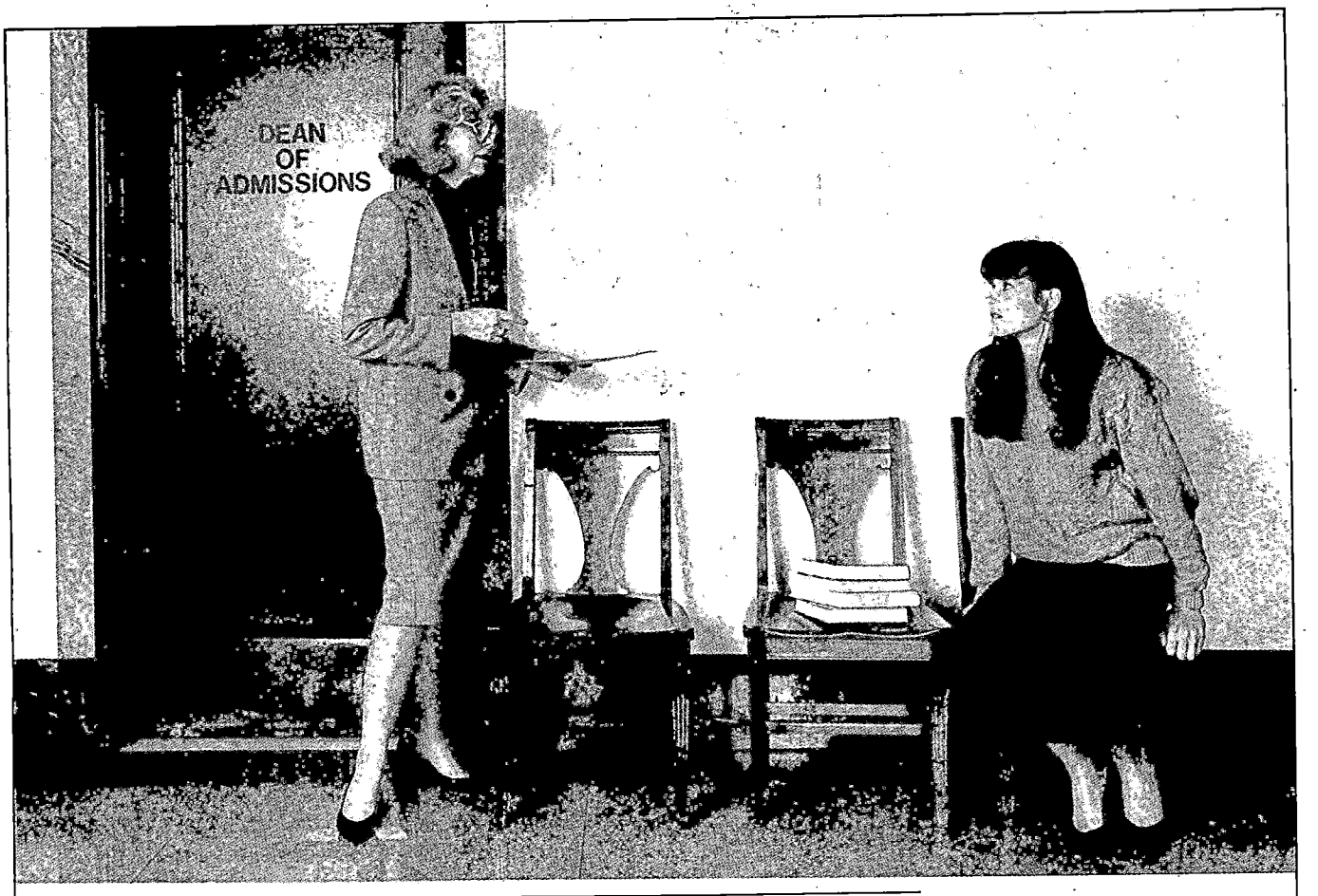
The Yale transplant team

I would like to call attention to a small oversight on page 48 of the February issue of *Johns Hopkins Magazine*. Dennis Spencer, chief of neurosurgery, performed all the cultured fetal cell transplants for the treatment of Parkinsonism at Yale. D. Eugene Redmond is professor of psychiatry and heads the multidepartment effort. Timothy Vollmer acts as liaison for the neurology department.

OGNEN A.C. PETROFF, MD '77
DEPARTMENT OF NEUROLOGY
YALE UNIVERSITY

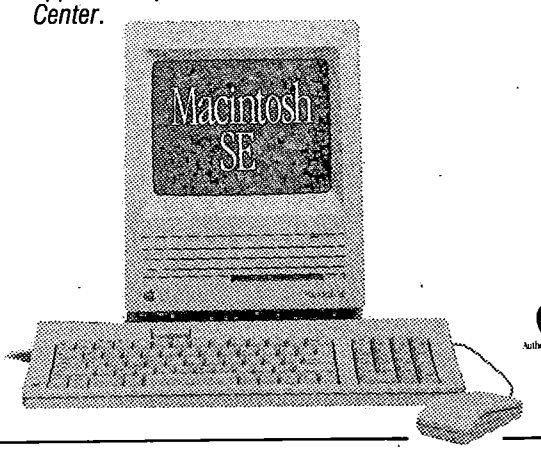
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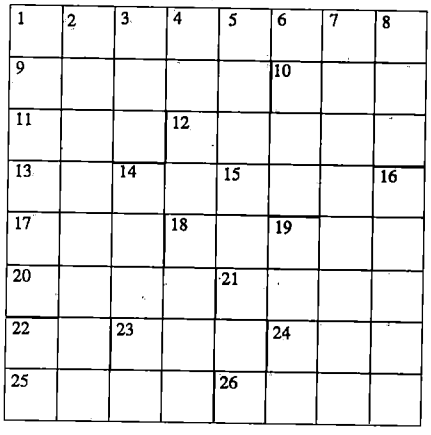
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The British Crossword

Puzzles within a puzzle

The words entered in a typical American crossword puzzle are *defined* for the solver. In the more difficult British puzzles, such as in the *Times* (of London), many other British newspapers and magazines, and a few American magazines, the "rules" for crosswords are quite different. The entries (usually called "lights") are not *defined*, but *clued*, almost always with two clues per entry. Usually one comes close to being a definition, and the second is some form of wordplay: an alternate meaning or reading of the word, an anagram, a homophone, or hints about pieces of the word. The two clues are strung together with punctuation and syntax designed to mislead any solver who takes them seriously. Each entry should be regarded as a challenging puzzle unto itself, with the extra attraction that these puzzles interact.

A good starting strategy is to go through all the clues, looking for one or two that you can decode. Anagrams are often the easiest to spot and are usually highlighted by modifiers like "scrambled" or "bizarrely" next to the word to be rearranged. Clues may suggest removing one or more letters from the beginning, the end, or the middle of a clue word. The entry may be contained in an overlap of two or more clue words. Pieces of the entry may be clued by short words to be entered in reverse order, usually indicated by such expressions as "running back," "rising up," or "backward." When you think you've found an entry, see if you can explain the entire clue, frequently by re-parsing it. If it all fits, you have good confirmation of your solution.



As an introduction to this genre, I've composed a small puzzle (8x8) to let you practice what you've just read. Persistence pays off. Don't be easily discouraged.

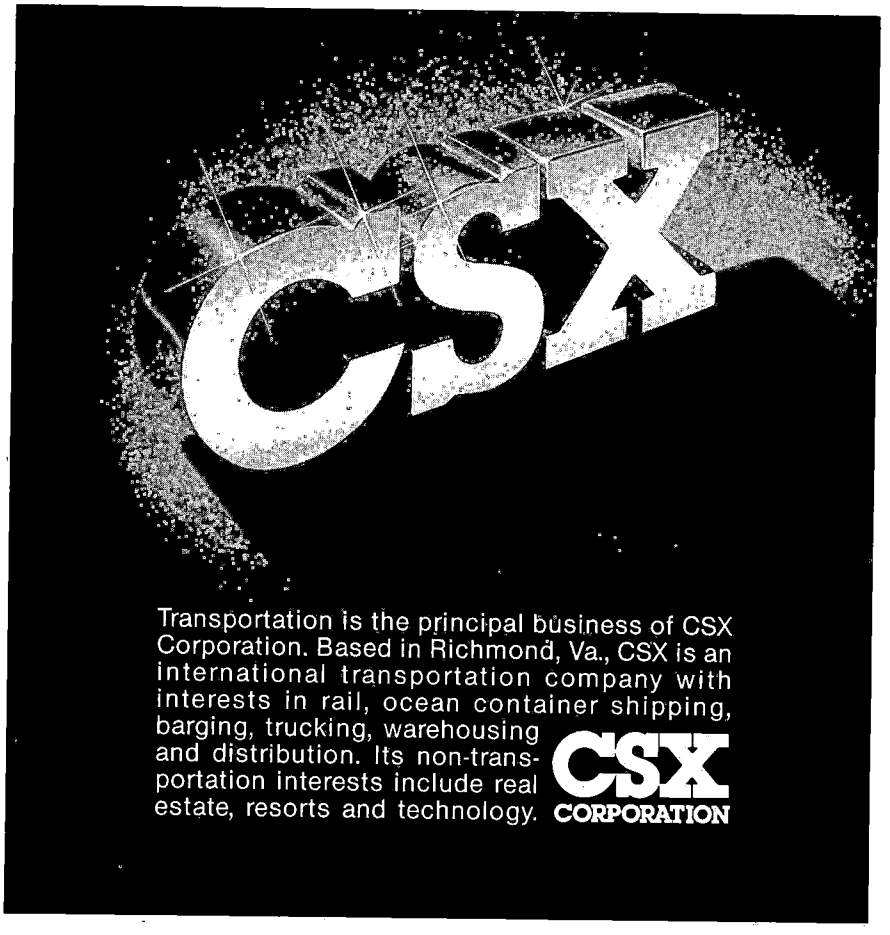
The Clues

ACROSS

1. French pal with wire is friendly (8)
9. Folk singer's wood knots (5)
10. Get-up or Veda (3)
11. Purpose to sue strangely (3)
12. A striking sound mimicry (5)
13. Fake stone is Irish symbol (8)
17. Were headless before (3)
18. Overgrown like 41st president? (5)
20. Soar erratically and surreptitiously after sub (4)
21. Palm in miserable pain (4)
22. Timeless pot flower in Italy (2)
23. With no left, like DDE (3)
24. Incomplete city in reverse twitch (3)
25. Hungarian in bad rime (4)
26. Skunk with potassium deficiency scuttled (4).

DOWN

1. Ruffian will bear us poorly (6)
2. Porridge space for fungus (8)
3. Fired endlessly in anger (3)
4. Baby sheep in pastry at seafood picnic (8)
5. Sap churned a Nile serpent
6. Job riot containing musical zest (4)
7. Critical fastener with nip coming up after





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One of the monuments to American learning and advancement in the 19th century and Baltimore's first major cultural institution, the George Peabody Library was acquired by The Johns Hopkins University in 1982. Not surprisingly, the George Peabody Library and The Johns Hopkins Library collections contained duplicates and it was decided that ten of these would be sold for the benefit of the George Peabody Library.

On June 23 and 24, Sotheby's will auction the plates from complete editions of John James Audubon's two great works, *The Birds of America* and *The Viviparous Quadrupeds of North America.*

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Long considered among the most precious works in the history of American art, *The Birds of America* is composed of 435 hand-colored engravings drawn from John James Audubon's renowned watercolors of American birds. Painstakingly engraved and printed in England, the plates were issued to subscribers between 1827 and 1838. The birds, rendered life-sized and with scientific exactitude, are shown in their habitats, busily engaged in their natural activities. We can imagine the squawking of the squabbling Eiders, admire the complexity of nature's design in the pattern of the Louisiana Heron's plumage and watch the panicked scattering of the Pigeon Hawk's prey. The degree to which wildlife is captured in these compositions of elegance and refinement is the true measure of the success of Audubon's art.

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Audubon's important companion to *The Birds of America, The Viviparous Quadrupeds of North America,* printed between 1845 and 1848, reflected Audubon's lifelong interest in drawing animals of all types. Not content with the usual academic representations of mammals, Audubon, despite his 57 years, traveled to remote places on the virtually unexplored North American continent to find and draw the quadrupeds in their native environments. These 150 hand-colored lithographs were taken from the resulting watercolors. Just like the birds in Audubon's earlier work, the animals are captured in their natural environments engaged in their natural behaviors. Scientifically accurate and life-like, these images of American wildlife are magnificent examples of the great nature painter's artistry.

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Funds raised from the sale of these plates will benefit the endowment of the George Peabody Library of The Johns Hopkins University.

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J.J. Audubon, *Iceland or Jer Falcon* (Plate CCCLXVI), hand-colored engraving with aquatint, from the Havell edition, 1827-1838, 38¼ by 25⅝ inches.

SOTHEBY'S
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mob murder, I hear (8)
8. Incite beggar with bar removed (3)
14. Norse gods arise strangely (5)
15. Oddly nurse these magic verses (5)
16. Packsack sounds like Arctic canoe (5)
19. Rumpled suit within in original place (4)
22. Type jumble is geometric constant (2)

Solution to the British Crossword

Note: It is a common feature of British-style crossword puzzles to have some words that are not clued in the usual way, or not entered in the usual way, or both. In this puzzle, there are eight such words, which appear in the completed puzzle either entirely within other words, or occur oddly, as you will discover when you have found them.

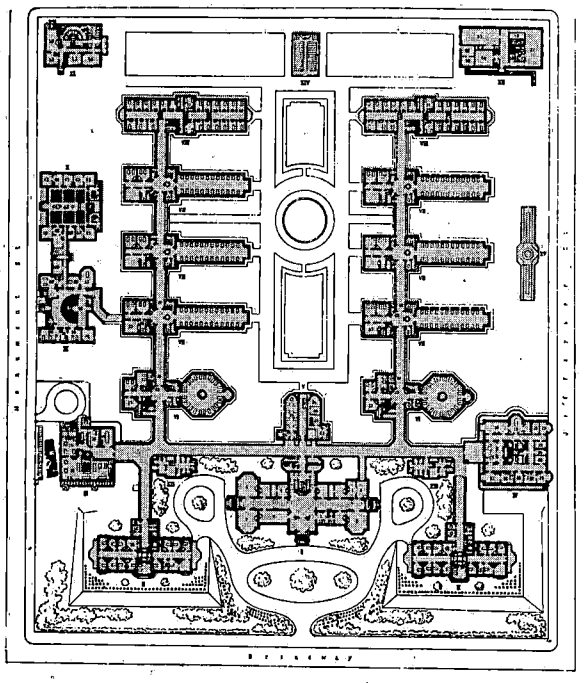
1 A	2 M	3 I	4 C	5 A	6 B	7 L	8 E
9 B	U	R	L	S	10 R	I	G
11 U	S	E	12 A	P	I	N	G
13 S	H	14 A	M	15 R	O	C	16 K
17 E	R	E	18 B	U	19 S	H	Y
20 R	O	S	A	21 N	I	P	A
22 P	O	23 I	K	E	24 T	I	C
25 I	M	R	E	26 S	U	N	K

Across words
a. Isinglass (4)
b. Ocean (3)
c. Passageway to Hades (6)
d. Hawaiian food (3)

Down words
e. Public conveyance (3)
f. Roman bronze (3)
g. Dried fruit (5)
h. Move very slowly (4)

ACROSS
1. AMI + CABLE
9. BURL [IVES]'S
10. RIG-[VEDA]
11. sue (anagram)
12. A PING
13. SHAM + ROCK
17. [W]ERE
18. BUSHY (like Bush?)
20. soar (anagram), [sub-]ROSA
21. pain (anagram)
22. PO[T] = flow-er (river) in Italy
23. [L]IKE = Dwight D. Eisenhower
24. CIT[Y] (reversed)

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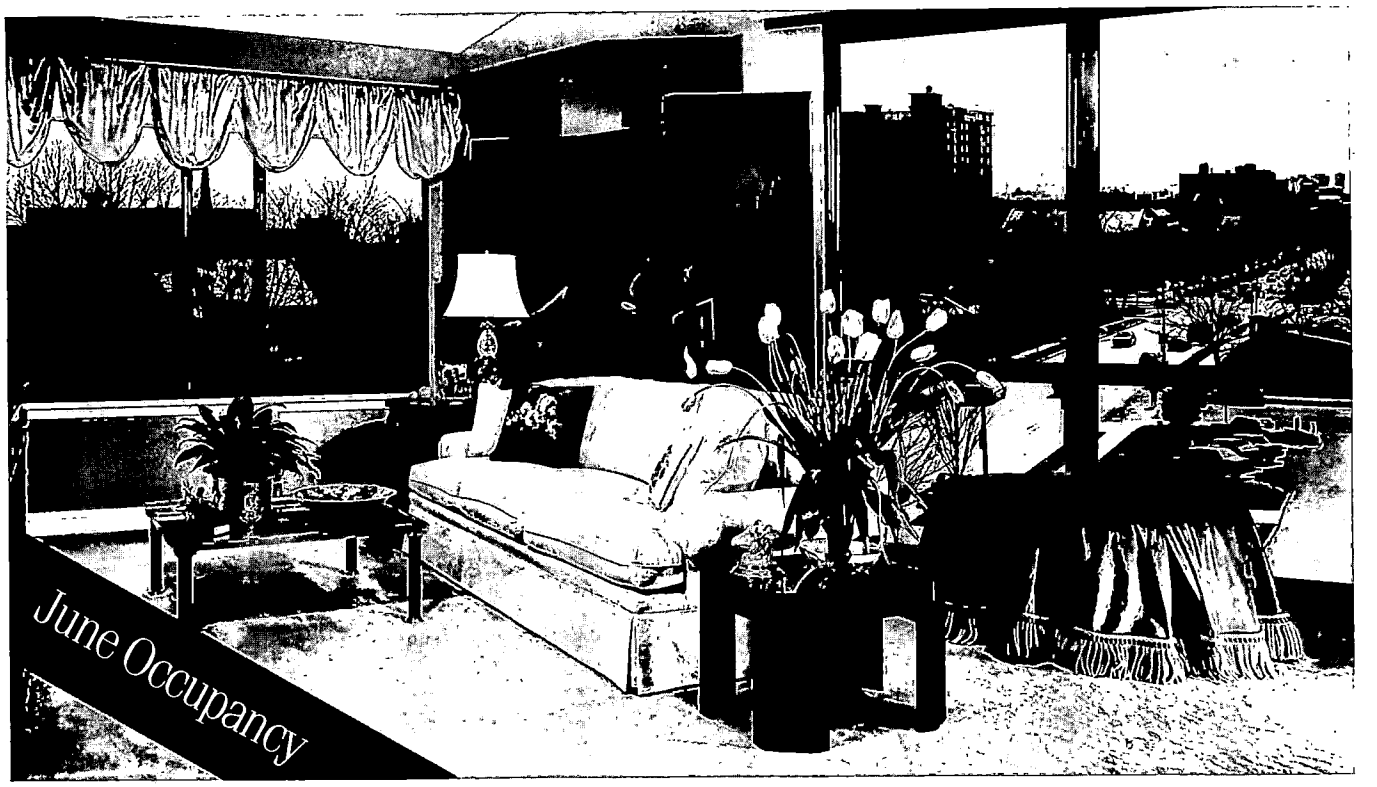
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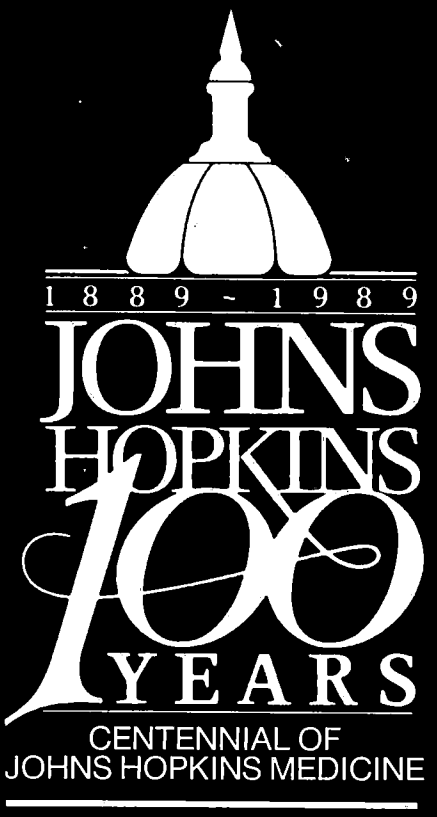
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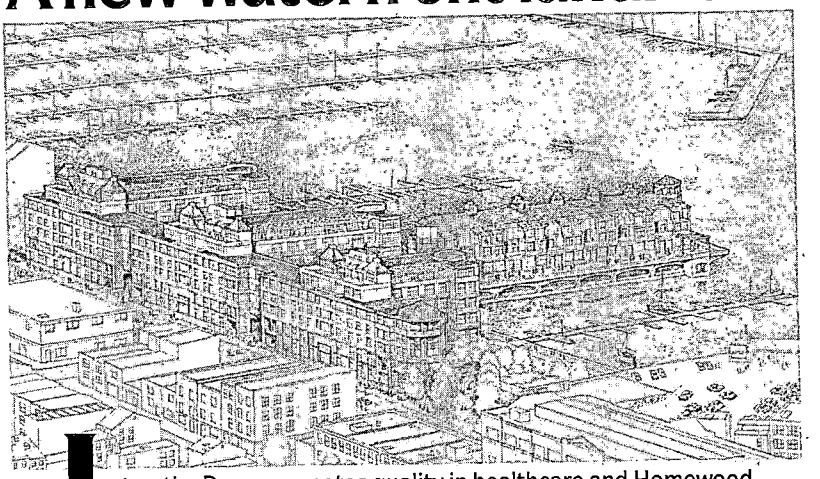
25. rime (anagram)
26. S[K]UNK (K is chem. symbol for potassium)

DOWN
1. bear us (anagram)
2. MUSH + ROOM
3. [F]IRE[D]
4. C{LAMB}AKE
5. sap (anagram)
6. joB RIOt
7. LYNCH homophone + nip (reversed)
8. BEGGAR - BAR = EGG
14. ARISE (anagram); *or* A + RISE *rising*
15. nurse (anagram)
16. KAYAK homophone
19. suit (anagram) with IN = [IN] SITU
22. PI (two meanings)

The eight special words occur *oddly*, i.e., in the odd rows and the odd columbs, as follows:

a. MICA
b. SEA
c. EREBUS
d. POI
e. BUS
f. AES
g. PRUNE
h. INCH

A new waterfront landmark



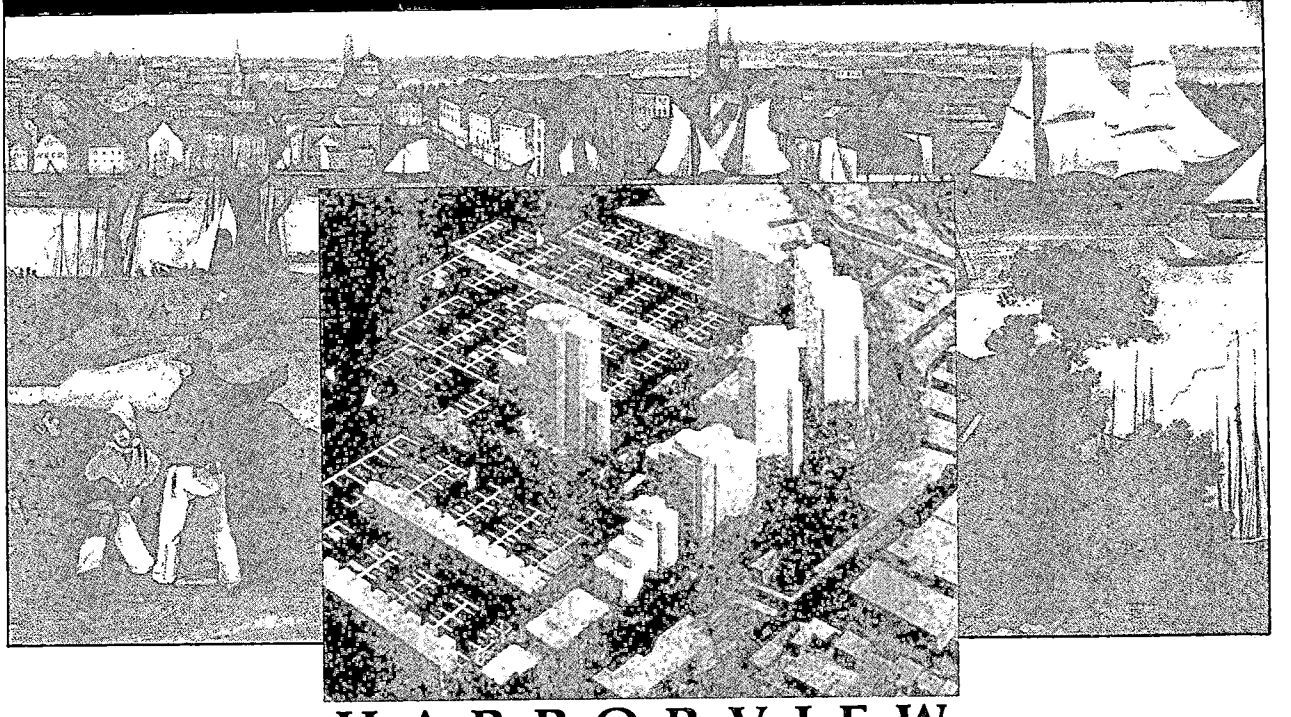
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Findings

A CHILDREN'S EYE TEST ON A CEREAL BOX?

One in every 25 children develops crossed or lazy eyes by age 8 or 9, but most cases are not detected until too late: By the time the condition has been noticed by a parent, the child is doomed to less-than-perfect vision. But two devices developed by researchers at the Wilmer Eye Institute—one simple enough for parents to use at home—may make it possible test both infants and preschool children in time to lessen the impact of these vision problems or even prevent them altogether.

Strabismus, or crossed eyes, and amblyopia—lazy eye—are usually treated with glasses, surgery, or both. Strabismus is second only to fitting for glasses as the most common reason children visit the ophthalmologist. The earlier the condition is diagnosed, the more effective surgery is likely to be. In older children, surgery can correct the cosmetic problem by giving a child normal-looking eyes, but often cannot restore normal vision.

The key to improving vision, doctors believe, is early screening—perhaps as early as an infant's fifth or sixth month of life, when eye muscles and brain signals combine to produce normal, or nearly adult, vision (eye development continues after infancy, but not at this dramatic pace). Kurt Simons, assistant professor of ophthamology, says that all children should be tested by the time they enter school.

To help meet that goal, Simons and associate professor of ophthamology David Guyton have created a plastic card test, simple and inexpensive enough to be mass-marketed. "Testing children in school is too late," Simons says. "But how, when most parents aren't aware of the need for tests, do you catch most children before school? The idea is to have a test you can hand out in McDonald's, a test you can put on cereal boxes—a test simple enough for parents to do themselves."

Their plastic card device is designed to test stereoscopic, or 3-D, vision. (A child with incipient strabismus or amblyopia cannot see in 3-D.) It uses lenticular film, most familiarly seen in novelty toys with pictures that move when you rotate the toy. The cards are covered with blue stars. When one is held a certain way, a circle of stars appears to jump out at the viewer, which a child who cannot see 3-D will not see. Compared with most current tests for preschoolers, the test is cheap: less than a dollar per device. The researchers are hoping a sponsors will come forward to mass-produce the test.



Preventing lazy eye: *Ophthalmologists Kurt Simons (left) and David Guyton (right) hope to test patients at infancy on the haploscope they designed.*

The second device created by Guyton and Simons is at the other end of the cost and technology scale: the remote haploscope. The device also tests for stereoscopic vision, but using expensive optical and computer technology.

The device can test children and even adults, but it was designed primarily to meet the challenge of testing infants. Unlike preschoolers, who can answer questions, infants have no way to indicate what they see. And tracking an infant's vision—or even holding an infant's attention—is no easy matter.

The haploscope tests infants by tracking their eye movements as they look at a picture. If their eyes follow the movement of a 3-D object, then researchers assume they see it. The remote haploscope consists of a computer screen, an infrared tracking camera, and a holographic eyepiece. The computer screen displays a pattern of black and white dots, known as a random dot stereogram. To test vision, blocks of the dots are moved across the screen. To someone with strabismus, or to someone with normal vision using only one eye, the moving dots are invisible. To a child with normal eyes, a pattern of moving rectangles is clearly visible.



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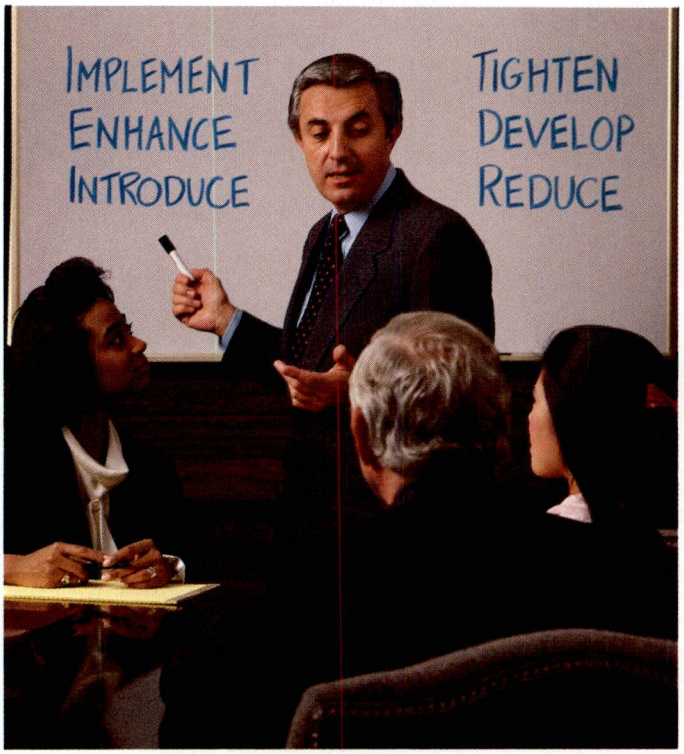
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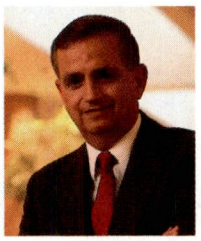
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Although the device has no conventional eyepiece, mirrors and a hologram make one seem to float in space before the screen. (It is so realistic some babies try to touch it, says Simons.) The hologram moves along with the infants' movements to make sure they continue to see the computer screen. Finally, an infrared camera locks in on their pupils and tracks their movement, feeding that information into a computer. Bells, whistles, and images of animated talking faces keep the babies' attention focused on the screen. "This is the most advanced infant test in America," says Simons.

With a price tag of $100,000 or more, the device is not practical for widespread use. But researchers hope to use it to test a large number of infants to determine when strabismus and amblyopia first develop.

"Is it possible to pinpoint strabismus in very young infants?" Simons says. "We don't know. We do know infants see a lot better a lot earlier than anybody ever thought. If we can test them, we may find a way to prevent strabismus entirely."

Guyton and Simons are waiting for funding to begin screening infants through the School of Medicine's pediatrics department. They believe the remote haploscope will allow them to develop a whole battery of computer-directed tests for infant vision.

—Lisa Hooker

TAKING THE TWINKLE OUT OF STARS

Songs and poems to the contrary, stars don't actually twinkle. Twinkling, or the perceived motion of light around stars, is caused by turbulence in Earth's atmosphere as light passes through it. The resulting optical distortions have always been a problem for astronomers; escaping them will be one of the advantages of the orbiting Space Telescope.

But while waiting for that telescope to be launched, Hopkins astronomers have developed a ground instrument that takes the twinkle out of starlight. It is one of the first applications of a new tool called adaptive optics that is expected to revolutionize ground-based astronomy.

The Adaptive Optics Coronagraph corrects for the distortions of turbulence by linking special mirrors with a computer and sensors capable of detecting when an image is fuzzy, says associate research scientist Samuel Durrance.

Durrance (who is in final training for the shuttle mission that will deploy the Hubble Space Telescope) and a team of scientists developed the system. In March, they had

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Johns Hopkins University, 1947

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a chance to test it, attaching it to a 40-meter telescope at Las Campanas, Chile. The team was one of the first to develop a working adaptive optics system. Combined with the coronagraph (a fairly common instrument used to block out the bright light of a star to allow astronomers to view fainter objects nearby), the new system will allow Durrance to study circumstellar discs, the clouds of dust and materials that may be the starting place for planet formation.

To change fuzzy images to crisp ones, the adaptive optics system takes light waves entering a telescope and manipulates them. Initially, light will strike sensors that determine where and how the waves are deformed. The sensors send information to a computer, which activates two mirrors: one "rubber" and one flat. The first, a thin membrane stretched over electrodes, can change the contours of its surface 100 times a second. The flat mirror, controlled by piezoelectric circuits (which translate electrical current into mechanical energy), will wobble 100 times a second. The com-

Results

■ **Calcium clues:** For the first time, a molecular defect may have been identified as the cause of a form of inherited heart disease. Hypertrophic cardiomyopathy (HCM) is marked by an increase in heart muscle mass that sometimes causes heart failure. Tissue samples from 16 people with the somewhat rare disease showed a third more calcium channel receptors—molecular pathways into the cell—than those from patients with other forms of heart disease. Calcium in the right amount is known to be necessary for proper heart function, while too much can disturb it. Neuroscientist Solomon Snyder, assistant medicine professor Harlan Weisman, and other scientists at Hopkins and at the National Heart, Lung and Blood Institute conducted the study, which could lead to improved therapies for heart disease.

■ **A trap for cancer cells:** A form of lung cancer resistant to drugs and radiation may eventually be treated by a new therapy that tricks cancer cells into accepting a substance that eventually stops their growth. Researchers at Hopkins, led by Robert Casero Jr. and Raymond Bergeron of the University of Florida, have developed chemical analogues of spermidine, a type of polyamine. Polyamines are naturally occurring substances needed for cell growth. The analogue actually stops cells from growing by almost completely eliminating the production of polyamine. The researchers say the analogues could be most effective in treating large cell lung cancer, but could be used in other types of cancer that, over time, become less responsive to radiation or chemotherapy.

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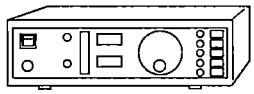
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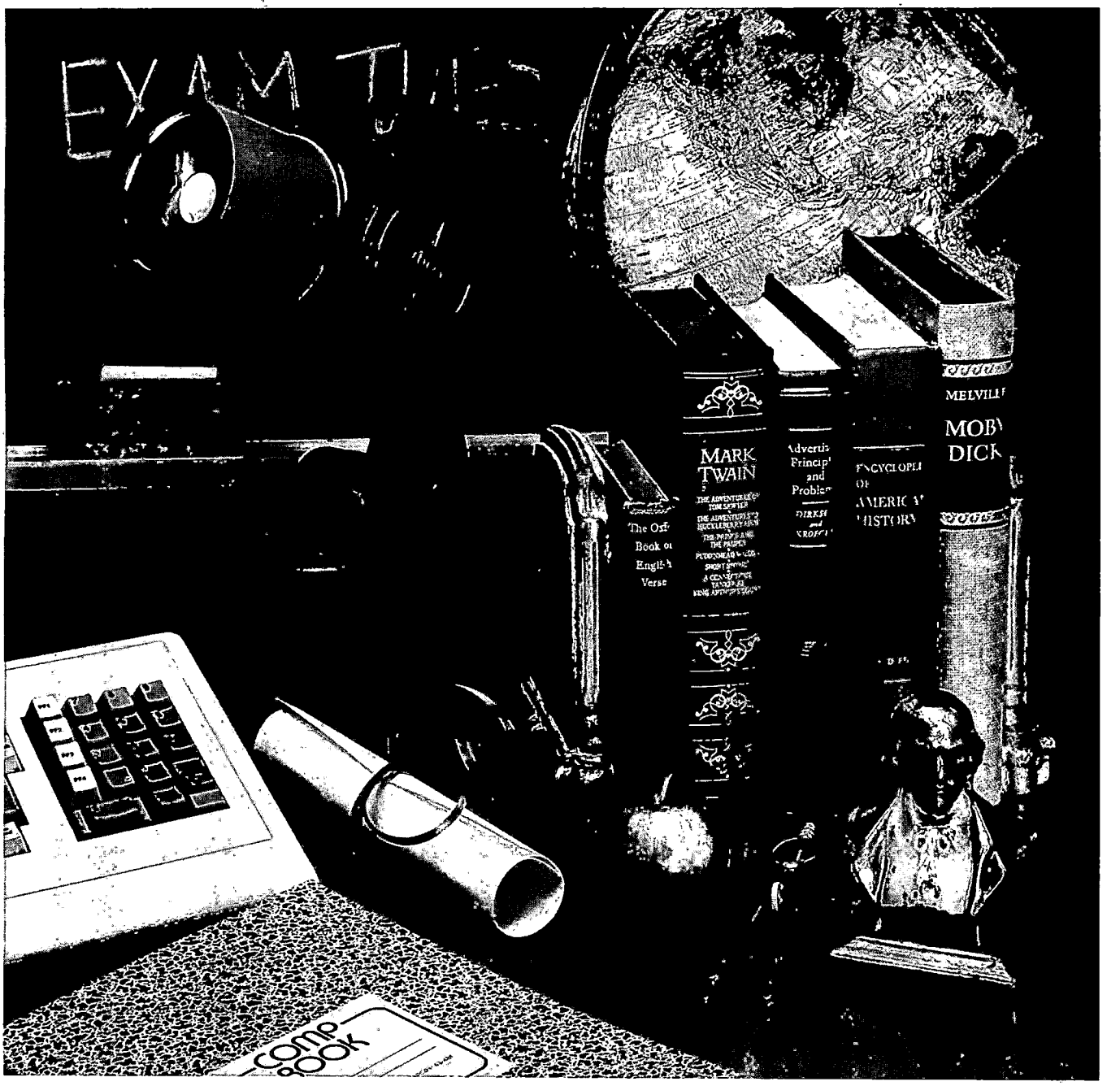
Still waiting for his shuttle mission, Sam Durrance helped test a new device for ground-based telescopes.

puter continuously provides signals that allow the mirrors to respond to light.

The result is an image identical to one produced by undistorted light waves. Initial tests in Chile with only the flat mirror have been promising. The astronomers used the system for 18 observing nights before bringing it back to Hopkins for modifications.

"Eventually, I think every telescope will use adaptive optics," Durrance says. "It has the potential to change the entire field of astronomy." The system should be especially useful in improving the imaging of faint objects. Once the modifications are complete, the astronomers plan to expand the system to include the rubber mirror and transfer it to the 100-meter telescope at Las Campanas. —LISA HOOKER

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"If a little knowledge is dangerous, where is the man who has so much as to be out of danger?"
Thomas Huxley

The truly educated person knows that there's no end to acquiring knowledge, or skills, or abilities. The world continues to offer up new challenges and opportunities, which must be seized and acted upon as they arise, or be lost forever.

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Basically, a healthy lifestyle is made up of rather simple elements.

1. GOOD DIET: a varied diet that includes the proper intake of essential nutrients, particularly proteins, fiber, minerals and vitamins, without excessive salt, sugar and fats.
2. WEIGHT CONTROL: to help prevent illnesses associated with obesity, such as diabetes, hypertension and some cancers. Food intake should be adequate to maintain optimal body weight, and it should be geared to your level of physical activity.
3. EXERCISE: tones the tissue, is good for the heart and blood vessels, and helps bring the proper nutrients to cells throughout the body. Exercise can be any one of many sports: swimming, tennis, bowling, skiing, golf, bicycle riding, jogging, etc. If you cannot afford or do not enjoy such sports, simply walking several miles every day can keep you fit and help you look trim.
4. REST AND RELAXATION: That means rest breaks (both morning and afternoon), a good night's sleep, healthful weekend activities and regular vacations.
5. THINGS TO AVOID: Don't eat foods to which you are allergic or sensitive. Avoid irritants in clothing and in your environment. Whenever possible, avoid situations that are tension and anxiety producing. Above all, avoid excessive smoking and alcohol. Cut down or stop; better yet, don't start.

These are five good Healthy Lifestyle rules, which both you and your family should follow.

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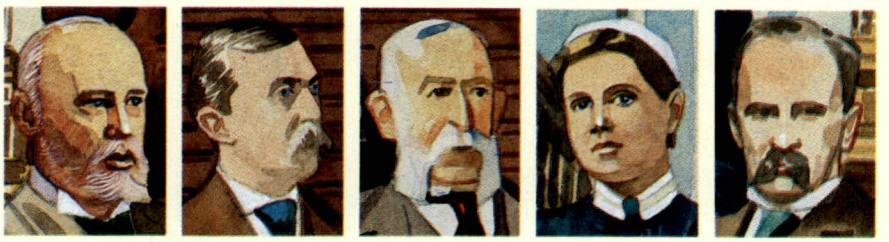
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A HEALING VISION



In this age of federal grants and supercomputers, it's tempting to attribute the wonders of modern medicine to impersonal forces of science and history. But they can be traced to a time when cholera was fought by burning fires in the streets and a hospital was as likely to kill you as save you. A few individuals made a tremendous difference in changing all that. Some of them gathered at Hopkins a century ago, including (from left) William Welch, John Shaw Billings, Daniel Gilman, Isabel Hampton, and William Osler. Gilman brought European-style science to the new Johns Hopkins University. Billings designed a sanitary hospital and combined it with a pathbreaking medical school. Hampton gave nursing students an education, not servitude. Osler taught medicine at the bedside, not in the classroom. And Welch took the lessons of the laboratory to the public to prevent disease. The convergence of these (and others) and their ideas set a powerful example for American medicine.

OPENING DAYS: JOY AND RELIEF

BY JILL JONNES

ONE HUNDRED



The long-awaited opening of Johns Hopkins Hospital—and its closely allied medical school—almost didn't happen. One setback followed another. But they all turned out to work mightily in favor of a new beginning in American medicine.

YEARS AGO

THE MORNING OF



nd mild, a perfect spring day in
ew India silk Easter dress and a
, John Shaw Billings's 16-year-

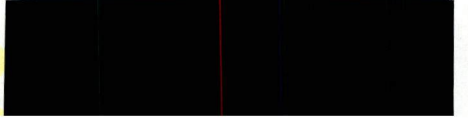
doctors, yellow for public officials), then pressing on into the sea of cane-bottomed seats surrounding the spacious rotunda. All was festive with flowers, flags, draped green ropes of smilax, and floral baskets. Up in the second gallery the Fifth Regiment Band played Chopin and Wagner.

Young Margaret Billings drank in the scene: "Opening off the rotunda were a series of corridors, like the spokes of a wheel, leading to the various wards, operating rooms, etc.—a most impressive sight. And standing at the partially opened door of every ward or room down these vistas was a starchly uniformed trained nurse."

In the rotunda itself, chairs were arrayed around "a raised platform on which notable men of medicine, the Trustees and other distinguished guests were seated. We had 'family seats' just to the right of the platform so close I could plainly see the faces—many of them quite familiar to me—of the speakers. Several had visited our house many times and Father had taken me to their homes. I remember Dr. Osler, Dr. Welch, Dr. Kelly, Dr. Halsted."

Margaret Billings remembered not a word of the speeches ("There were no funny stories"), but easily described the

Decent people in the late 1800s who fell ill preferred to be treated at home. Hospitals were considered to be a last resort, since physicians could do little to combat disease.

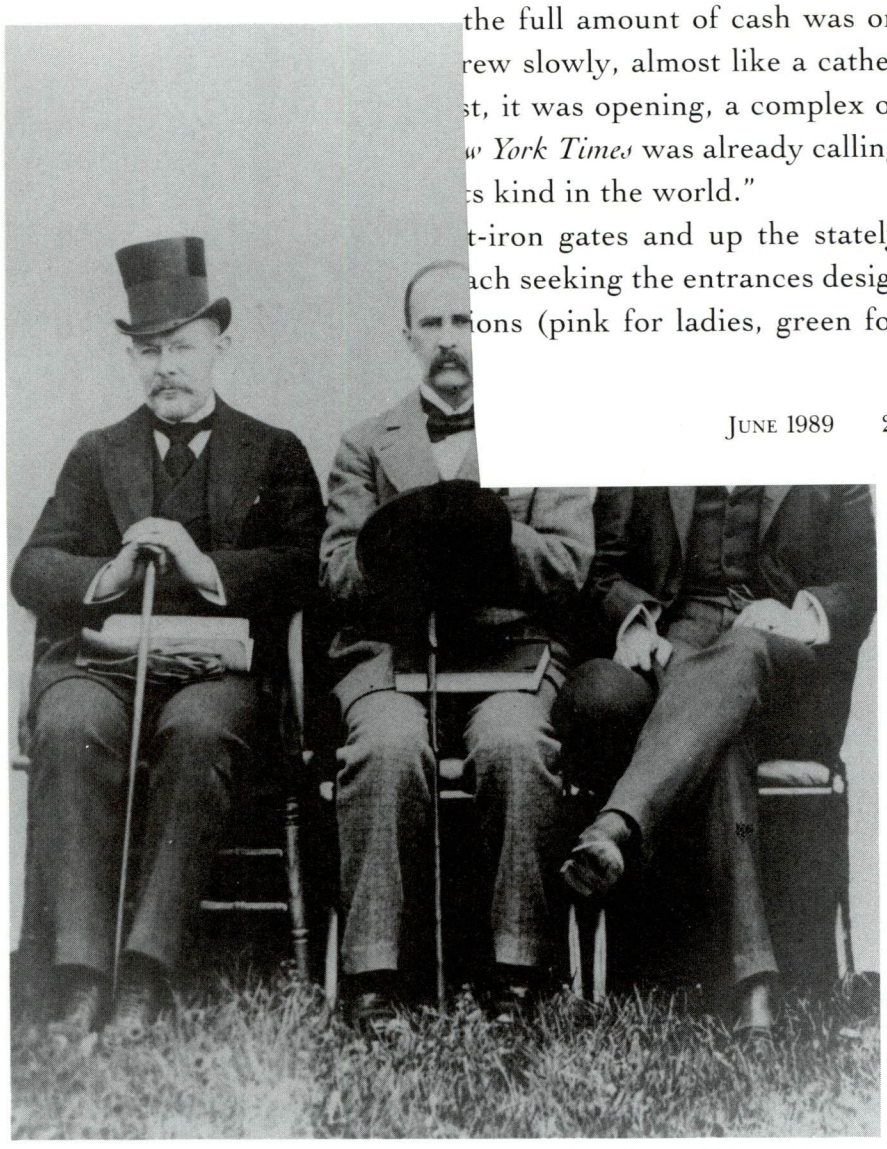


rotunda of the Administration building (whose upper floors provided housing for residents) could have walked straight ahead and then right to visit the female private pay ward, passing the apothecary and nurses' residence enroute. Or headed left, viewing the bath houses providing Turkish, Russian, sulphur, and mercurial baths, before entering onto the main outdoor corridor connecting first the Octagon ward (for surgical patients), then one after another the three separate pavilions housing each of the common (charitable) wards for all other patients, and then the final isolation pavilion. In each pavilion long, tall windows allowed light and sunshine to flood in. To thwart the possible spread of germs from ward to ward no elevators had been allowed, just circular staircases. In total, the hospital had 220 beds.

Fronting on Monument Street was the 280-seat surgical amphitheater and then the dispensary for outpatient care, its large waiting room able to accommodate 400. On the far corner of the lot at Wolfe Street stood the pathology building with the morgue and laboratories. All around were broad, well-tended lawns, which "in an emergency [would] furnish plenty of space



aret felt "almost overcome with
en working on the plans in our
h my childhood years. . . . The
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ach seeking the entrances desig-
ions (pink for ladies, green for



"Respectability, sobriety, godliness in the faces of the young professors!" wrote William Osler around 1900. He is flanked by William Halsted on the left, Howard Kelly on the right.

ognized this when he laid out his ambitious and unorthodox dream of establishing in his adopted city both a great research university—one boasting not only a graduate school of liberal arts and the sciences, but also a medical school—and a new charitable hospital to be linked to the medical school. When he died in 1873, Hopkins left behind the unprecedented sum of $7 million (to be divided equally between the university and the hospital), careful instructions, and determined trustees.

In 1875 the trustees lured east Daniel Coit Gilman, president of the University of California, to plan, build, and run the Johns Hopkins University. The nation's first university with an established graduate program, Hopkins quickly flourished, its commitment to original scholarship attracting a distinguished faculty and high-caliber students. Having spent time on the Continent and at the University of Berlin, Gilman was seeking to replicate at Hopkins the European academic atmosphere of "intellectual freedom in the pursuit of truth."

As Gilman well knew, the field of scientific medicine was surging forward in the great European research centers. Dreaded diseases like tuberculosis, typhoid, cholera, meningitis, and leprosy were beginning to yield up their secrets to a generation of European medical scientists inspired by such giants of the laboratory as Louis Pasteur and Robert Koch. With most of American medicine still in a primitive state in 1876, Gilman recruited Henry Newell Martin from England to train graduate and prospective medical students in the first American biological laboratory. Nine years later, William Henry Welch came from New York to open his pathological laboratory and prepare for the medical school.

But fulfilling the second half of Hopkins's great vision—starting the hospital and medical school—proved considerably more arduous. The trustees selected as the hospital's designer Army surgeon John Shaw Billings, one of the outstanding men of his generation (he would subsequently organize and run the New York Public Library), with the rightful expectation that he would contribute far more than physical plans. He brought Hopkins a great many ideas about how the best of care and research could be united in an American setting, both physically and intellectually.

In 1877 construction commenced at Broadway and Monument Streets (formerly occupied by a state lunatic asylum), with completion on the great medical enterprise expected in 1885. But the trustees would build only as fast as the endowment income paid for, and by 1885, to the dismay of city officials and doctors, the hospital was far from complete. Nearly half of Hopkins's bequest had been in B&O Railroad stock, which he asked the trustees not to sell. But hard times led the railroad to reduce its dividend in 1886 and 1887—and eliminate it entirely the next two years. Under the circumstances, it was fortunate that by early 1889 the great charitable hospital was completed and ready to receive patients.

Ironically, the endless delays had already proven a stroke of good fortune. Had the hospital opened earlier, Welch wrote, "we should probably have missed Mall, Abel, Halsted, Kelly, and, above all, Osler." The three who with Welch came to be known as the Big Four—surgeon William Stewart Halsted, gynecologist Howard Kelly, and physician-in-chief William Osler—would not have been available. Anatomist Franklin Mall (trained in Welch's lab) and chemist John Abel (trained in Martin's lab) would not yet have been steeped in the new scientific medicine.

Osler's first resident, Henri LaFleur,

ised on his practical experience with nitation, ventilation, lighting, and other oblems in [Civil] war hospitals. . . .

superior hospital was still regarded with considerable and understandable skepticism. Before the Civil War, writes Charles Rosenberg in his history of American hos-

would later sum up the freedom this assembled team felt on opening day: "To blaze a perfectly new road, untrammeled by tradition, vested interests, or medical 'deadwood'—best of all, backed by a board of management imbued with a fundamental and abiding respect for scientific opinion . . . what more could the heart of man desire?"

EIGHT HUNDRED GUESTS HAD SETtled into the chairs in the rotunda to listen to the speeches that Margaret Billings couldn't remember. One of the most eloquent speakers was her father, a tall, well-built man with heavy brown moustache and brown hair. In loving detail he described first the impressive bricks and mortar, and then his considerable vision of a more scientific approach to medicine itself. It was the laboratory, he proclaimed, the neglected stepchild of American hospitals, that promised "the saving of many lives, the relief of unspeakable agony, the warding off of pestilence from the city. . . ."

Baltimore, whose Department of Health prided itself on having lower death rates than many other cities of nearly half a million, had in the first months of 1889 suffered bad influenza and measles epidemics. Consumption, pneumonia, typhoid fever, cholera infantum—all were commonplace *(see box, page 22)* among inhabitants of the bustling port city, where lack of a modern sewer system would frustrate for years all serious attempts at better public health. Syphilis, a great scourge everywhere, was the subject of endless debate about proper treatment.

Billings, though, saw beyond the surrounding misery of the day. "We are on the verge of great advances in our knowledge of the causes and methods of disease, and feel sure that these will be only preliminary steps to far greater and better knowledge of how to prevent or to treat them than we now have. . . . These combined institutions will endeavor to produce investigators as well as practitioners, to give to the world men who can not only sail by the old charts, but who can make new and better ones for the use of others."

Gilman, his flowing mutton-chop sideburns and thick moustache now white, expounded upon the new hospital's mission and emphasized that a modern hospital could not function without a group—nurses—so important that the hospital would have its own school and residence. "Not one woman in 10," Billings had asserted, was "fit for the high art of nursing," but she who was properly trained and had the "physical health and strength, sound senses, loving-kindness, patience and tact . . . has the power of doing good and increasing happiness to a degree which few others possess."

Before Hopkins, the majority of American medical students became doctors with no clinical or laboratory experience. Unfortunately for their patients, they learned their skills on the job.

Yet this great moment when the hospital was finally opening, Gilman made clear, this great celebration in all its panoply, was badly marred. Rhetorically he demanded, "Is there anything wanting? Yes, there is still a great want to be supplied, an arch to rest upon these pillars: an institute of medicine and surgery, a college of physicians and surgeons, a medical school."

For it was the unique prospect of a medical school with its own hospital that had attracted the stellar early faculty to Hopkins, specifically a medical school with the unheard-of arrangement that the head of medicine (or gynecology or surgery) in the school would also head that clinical service in the hospital. Thus each chief would have complete control not only of clinical care in his particular domain, but of the relevant medical school curriculum, teaching, residency, and research programs. This ensured a coherence to the whole and allowed students (the raison d'etre of the entire enterprise) to have ready access to laboratories, and ultimately the wards and clinics. But for the moment the medical school remained as it had been when Johns Hopkins first envisioned it: a dream.

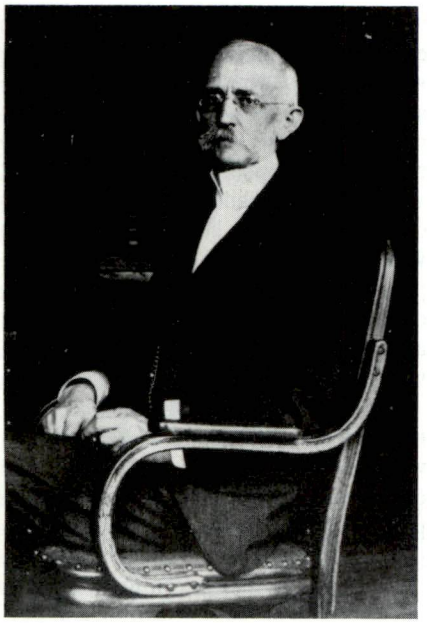
With the hospital at long last up and running, Gilman took a well-earned sabbatical. The hospital's first superintendent, Henry Hurd, prominent psychiatrist and head of the Eastern Michigan Asylum, had arrived to run the show. (Billings had declined the job.) Hurd was not only an excellent administrator, but a fine doctor whose editorial talents were invaluable as the hospital established new publications and societies to disseminate its research.

In his first report as superintendent on January 31, 1890, Hurd noted that the dispensary had had to start charging a dime to all patients who could pay. The hospital beds had been only about half full, and Hurd wrote, "The number of incurable afflictions has been extremely large. . . . This hospital, like many others with a reputation for good work, has undoubtedly had the misfortune to attract to itself a large number of hopeless cases." The major causes of admission in the white medical wards had been malarial fever (29, 1 death); pulmonary tuberculosis (16, 14 dead); and typhoid fever (16, 4 dead); in the black medical ward, pulmonary tuberculosis (9, 6 dead); and typhoid (4, 1 dead).

IN FEBRUARY OF 1893, ALMOST four full years later, Gilman announced: "When our present academic year began the possibility of opening the Johns Hopkins Medical School seemed more remote than it did sixteen years before, when the university began. Darkness preceded dawn." Thanks to the generosity of Mary Garrett and the Women's Fund Committee, "Anxieties and perplexities began to vanish like unpleasant phantoms." But not completely.

Francis King, president of the trustees, had once lamented to Gilman, "Where is the man to endow the Medical School?" It had been not a man, but a group of five women (including four daughters of Hopkins trustees) who had finally raised the needed endowment, and they had insisted upon two unheard-of requirements: First, that women be admitted to the new school on the same basis as men. As Osler said, while he was opposed to coeducation "on principle," he welcomed it warmly "when the ladies came forth with half a million dollars." And second, another bombshell: that every student entering the medical school possess (as well as certain premedical studies) the same qualifications as other Hopkins graduate students: a BA and knowledge of French and German.

At a time when most medical students did not possess even a college degree, this standard was viewed as suicidal: No students would come! Gilman, the trustees, and Welch were horrified. Gilman and the trustees exercised their individual and collective persuasive powers to convince Garrett, who had given the bulk of the money,





FROM JAMA, 36 (1901):1676

Henry Hurd (left), the hospital's first adminstrator, bemoaned the number of hopeless cases it had attracted. Microscopy students (right) discovered important clues for understanding human parasites by studying parasites in birds with malaria.

of the folly of these requirements. But she refused to budge. And so her dicta were accepted. After all, without her money there would be no school at all.

Many catalogues were printed (tuition was $200) and sent forth that June to attract students. But Welch remained doubtful that qualified applicants would materialize, and no opening ceremony was planned.

Instead, on October 2, 1893, the rotund, bearded Welch sat in the Biological Laboratory on North Eutaw Street waiting nervously to see if any of those who had expressed interest would appear. One can imagine his delight when a full 16 students, thirteen men and three women, arrived from Hopkins, Harvard, Yale, Vassar, Smith, Wellesley, Amherst, University of South Carolina, Swarthmore, and the University of Wisconsin. All of them were, well, within reach of the requirements, like Mabel Glover, who lacked organic chemistry and advanced physics. "Much to my surprise," she wrote, "I was admitted. Very few of the students had met all the requirements and they wanted some students." Two more entered a few days later. "In view of our extremely lofty and severe requirements for admission," Welch wrote his stepmother, "this is considered a good beginning." *The New York Times* reported that "unusual interest was given to the school because it is intended to be the highest medical institution in the United States, if not in the world." Osler said to Welch they were lucky to be at Hopkins as professors, for they would not have qualified as students.

From the distance of a century, it is hard to conceive that in those days the vast majority of American physicians completed medical education without ever encountering an actual patient—not to mention a laboratory. As Osler had decried at one meeting of the Maryland Medical and Chirurgical Faculty, so-called doctors were being graduated after 18 months of study, having "never attended a case of labor, utterly ignorant of everyday diseases, never having seen the inside of a hospital ward." Theirs was an education consisting almost entirely of lectures. Practical training, such as it was, came either on the job or by apprenticing with older doctors. The most ambitious traveled to Europe for further study. So Hopkins's vision of an American medical school based heavily on research and clinical training was very advanced for its time.

School began the day after the students were accepted. That first year was devoted largely to the laboratory and dissecting rooms studying anatomy with Mall, physiology with William Howell, and physiological chemistry with Abel.

Mall had an immediate and critical problem: "No cadavers were on hand, nor were the chances in favor of obtaining them good." There were then seven medical schools in Baltimore with 1,200 students, and in the previous year the state had provided but 49 cadavers by "regular" means. Presumably others had been obtained *sub rosa*. Meanwhile, Baltimore was having a scorching fall and Mall worried that even if he got cadavers, they would soon putrefy. Experimenting on dogs, he found carbolic acid an efficient embalming material.

November 15, the date for starting dissection, was fast approaching, and there were still no cadavers. "The students began to worry, for they knew we had no subjects. . . . [W]e postponed work until the 16th, and then the 17th, when, late in the evening, a subject was left in the basement. [A rather vague explanation.] The next day one came from the State, and a few days later another appeared in the basement. This made us safe until Christmas, or until Easter, provided we dissected carefully and preserved the specimens well."

One of that first group, Charles Bardeen (a future dean of the University of Wisconsin medical school), later described Mall's class: "Each student was assigned to a part of a cadaver and told to go to work. Most of us had little idea how to begin. Some were more intelligent or lucky than others in their first attempts at unraveling the secrets of human structure. These students received praise. Others were less fortunate and had the deficiencies of their work more or less caustically called to their attention. Quality of work, not learning lessons, was emphasized."

In short, the ethos of "learning by doing," of favoring laboratories over lectures, was adhered to from the start, though it was new, strange, and unsettling. As Llewellys Barker, Mall's assistant that year and a future Hopkins physician-in-chief, acknowledged, "The method was drastic, and some, I fear, never understood its

MERCHANT WITH A PLAN AND A VISION

By Sue De Pasquale

WHEN JOHNS HOPKINS WAS 17, his mother urged him to leave the family tobacco plantation in Anne Arundel County and join his Uncle Gerard, a wholesale grocer, in Baltimore. "Thee has business ability and thee must go where the money is," Hannah Hopkins told her son. Beginning as a grocer's helper in 1812, the young Quaker emerged 40 years later as Baltimore's most powerful financier—and greatest philanthropist.

Johns Hopkins was the first American to combine a hospital and a medical school. But who gave him the idea?



Johns Hopkins showed an uncommon farsightedness in all his business dealings; when he saw an opportunity, albeit risky, he seized it. As a merchant—despite his Quaker heritage, a mainstay was whiskey—he recognized the potential for transporting goods by rail when canals were still the overwhelming choice. He quickly became the largest stockholder of the nation's first railroad, the B&O, and later served as a director of the company. As a banker, he gave low-interest loans to young entrepreneurs other financiers wouldn't think of backing. As a pioneer in urban development, he modernized Baltimore's port by buying up slums and replacing them with warehouses and office buildings. Each of these ventures was very profitable.

JOHNS (THAT HAD BEEN HIS great-grandmother's maiden name) said he considered his wealth a trust to be used "for the good of humanity," and spent the final years of his life coming up with the best possible plan. He loved children but had no immediate family to inherit his fortune because he had not married the only woman he loved: his Uncle Gerard's daughter, Elizabeth. The Congregation of Friends frowned upon marriage between first cousins, and Elizabeth's parents forbade the match. Neither ever married.

While he did will about $1 million in cash and property to relatives and servants, Hopkins left the bulk of his wealth, $7 million, to endow a university of advanced learning, a hospital, and a medical school, with the express instructions that the institutions be linked. Hopkins's choice of education and medicine for his philanthropy is not surprising considering how highly the Quakers valued learning. His own schooling had ended abruptly at age 12, when his parents, in

sympathy with the abolitionist stance of the Friends, freed the slaves on their plantation, Whitehall. To young Johns's regret, both he and his older brother had to leave school to work in the fields.

He also knew firsthand the need for modern medical institutions. In his lifetime Hopkins had seen the city of Baltimore ill-prepared to face epidemics of cholera, small pox, and yellow fever. (He had a bout with cholera in 1832, and his brother Mahlon died of yellow fever in 1840.) Through these years, "the people resorted to the most absurd measures which they thought purified the air," Helen Hopkins Thom wrote in a biography of her great-uncle. "Some tied tarred ropes around their necks, and others lighted bon-fires at the street corners; physicians advised the burning of gunpowder and many citizens resorted to the repeated firing of guns."

In 1873, nine months before he died, Hopkins wrote a letter to his hand-picked board of trustees that outlined his plan for a hospital that would "compare favorably with any institution of like character in this country or in Europe," and employ "surgeons and physicians of the highest character and of the greatest skills" to give free care to the city's poor.

His blueprint for fulfilling the vision was straightforward. "In all your arrangements in relation to this hospital," he told the trustees, "you will bear constantly in mind that it is my wish and purpose that the institution should ultimately form a part of the medical school of that university for which I have made ample provision by my will."

With these words, and with the same foresight he showed in business, Hopkins adopted the radical notion that a hospital should be a place to teach and advance the art of medicine as well as practice it. He thus laid the foundation for such innovations as clinical research, the residency program, and joint chiefs of staff for the hospital and medical school.

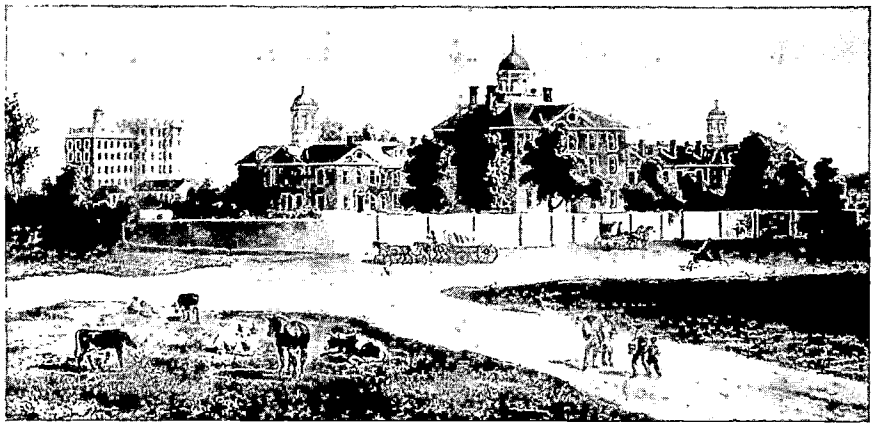
WHERE DID JOHNS HOPKINS, A merchant and banker with little formal education, a man who had never traveled farther than Cape May, New Jersey, get such an idea? John French, in his 1946 history of the university, notes that Hopkins served as an active board member of the State Asylum for the Insane (which stood on the site now occupied by Johns Hopkins Hospital) beginning in 1852, and as a trustee of the Union Protestant Infirmary.

Physician John Fonerden, a personal friend and medical adviser to Hopkins, served with him on the board of the asylum and probably shared his progressive views on medicine with Hopkins. After Fonerden died in 1869, the brilliant surgeon Alan Penniman Smith took over as Hopkins's personal physician. Smith, whom Hopkins named as a trustee of the hospital, was the grandson and son of Nathan and Nathan R. Smith, both leading medical educators. It seems likely that Smith, like Fonerden, spoke with Hopkins about the state of American medical education.

But the most important influence on Hopkins's thinking probably came from Baltimore physician Patrick Macaulay, French believes. Macaulay delivered an eloquent address on "Medical Improvement" in 1823 to the Medical and Chirurgical Faculty of Maryland, which was printed in pamphlet form a year later. Macaulay chastised the meager training required for a medical diploma at that time: "A young gentleman enters a physician's office, he reads twelve months, repairs to some medical college, and after an attendance at most on two courses of lectures, receives a diploma; now during that time he may not have seen ten important cases of disease."

In contrast, noted Macaulay, medical students in England, France, and Austria were required to complete five to seven years of study, spending much of their time at the actual bedside of patients. "You must all be convinced on a moment's reflection," Macaulay told the Maryland medical faculty, "how important it is for a student, before he enters on the extensive field of practice, to have previously had an opportunity of seeing and prescribing for diseases in the wards of an hospital or almshouse. So extensively are these great benefits appreciated in the European capitals, that every large hospital has become a medical school, in which lectures are delivered and diseases illustrated at the bedsides of the patients."

Patrick Macaulay died in 1849, long before Johns Hopkins had outlined plans for his bequest, and there is no direct evidence that the philanthropist read Macaulay's pamphlet on medical improvement. However, Macaulay was a prominent citizen of Baltimore. He served on the city council from 1827 to 1830 and was an original stockholder in the B&O Railroad. Moreover, the two men maintained summer homes only four miles apart in Baltimore County. It seems fairly certain, then, that the two men knew each other, and that Macaulay's ideas could have remained in Hopkins's memory until he had opportunity to carry them out. Most telling is the fact that Hopkins's personal collection of books—which he bequeathed to the Hospital—included 30 volumes on medicine that bore the book plate of Patrick Macaulay.



Hopkins was on the board of the Maryland Hospital for the Insane (above). It later moved from this site, which he purchased for Hopkins Hospital.

Whatever the source of the idea, Johns Hopkins was the first American who combined the initiative, the idea, and the money. The Quaker merchant had the foresight to realize that, in the words of William Osler, "the student of medicine has his place in the hospital as part of its machinery just as much as he has in the anatomical laboratory, and that to combine successfully in his education practice with science, the academic freedom of the university must be transplanted to the hospital." ■

Sue De Pasquale is assistant editor of the Alumni Magazine Consortium.

THE JOHNS HOPKINS

A MODEL OF ITS KIND

Volume I: A Centennial History of Medicine at Johns Hopkins

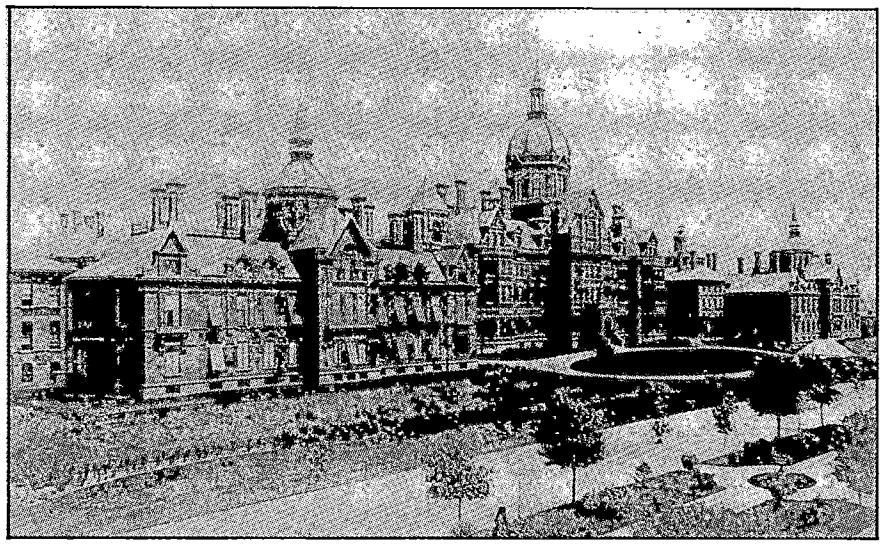
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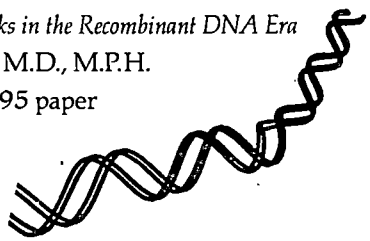
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THE BATTLEFIELD OF DISEASE

BY ANNE BENNETT SWINGLE

As a Civil War surgeon, John Shaw Billings organized field hospitals better than most civilian ones. What he learned drove his ingenious designs for Hopkins.

ONE SPRING DAY IN 1862, two Army men—one very large, with an air of importance, the other quite small and rather quiet—came by the office at the Union Hotel Hospital in Georgetown to see John Shaw Billings, the newly appointed first lieutenant and assistant surgeon from Indiana. Billings had scored first on the Medical Examining Board's entrance exam, beating out one of their own favorites. As the 23-year-old surgeon dutifully led them on a tour of the hospital, he discovered that the big man was Surgeon General William Hammond; the other was Jonathan Letterman, the new medical director of the Army of the Potomac.

"Day after tomorrow," Hammond said just before leaving, "all the surgeons in this hospital will be relieved, which will leave you in charge. You will be sent some contract doctors, and you are to go to the cavalry barracks at Cliffburne, on the hill back of Georgetown, turn them into a hospital and move this hospital out there as soon as possible."

Billings rushed over to see the barracks; to his dismay, he found them filthy and dilapidated. They had no drainage, no sinks, and no water within a half mile. He immediately ordered three wells dug. Next, he had extra doors and windows carved into the buildings for better ventilation. Then he arranged to have a new kitchen, mess room, bathroom, and washroom built, and had the apothecary shop, dead house, guardhouse, and stable fully equipped. He had his men pitch, frame, and floor 105 hospital tents, bringing the number of beds to 1,000. "I did



establish Cliffburne Hospital," he wrote to his fiancée when the job was done, "and when the wounded came in from the seven days' fighting before Richmond I was ready for them."

The incident exemplifies the vigor and resourcefulness Billings brought to the three most important projects of his life: the creation and completion of the Surgeon General's library, its Index Catalogue, and monthly Index Medicus; his 17-year directorship of the fledgling New York Public Library system; and, not least, his plan for the design and administration of the Johns Hopkins Hospital and Medical School.

Cliffburne, first of many hospitals Billings would establish, provided a relatively calm beginning to the remarkable period that would deeply influence much of Billings's life work. The wartime emergencies gave him the sad opportunity to see what situations really did help patients. Within a decade after the war, he was combining that experience with medical science.

BILLINGS PERFORMED HIS FIRST surgery in the field as Hooker engaged Lee at Chancellorsville on May 2 and 3, 1863. A graduate of the Medical College of Ohio, he had spent a year at Cliffburne and then most of another at the Army General Hospital in West Philadelphia, and was now a medical officer with the Army of the Potomac, then encamped near Fredericksburg. There was no ambulance corps. As the troops retreated, Billings had to move back his entire hospital, over and over again, struggling to keep pace. But the bloody battle of Chancellorsville was only a taste of what lay ahead. Two months later, Billings was marching toward Gettysburg.

Now a surgeon in charge of the field hospital, Billings set up his operation at a farmhouse a half mile behind the first firing line. By midnight, there were 850 wounded at the house, inside it and all around it, under the trees, and in the big barn. Just then, medical director Jonathan Letterman hurried in, announcing that the hospital would have to be moved at once because the fighting was getting nearer. Shells began to drop nearby as the first train of ambulances left, Billings wrote, "but no one was injured."

On the banks of a small stream, Billings arranged shelter for the most seriously wounded. A steady rain that would last five days and nights began the next morning. A day later the regimental supply wagons arrived with tents and provisions, after which the division moved out, leaving Billings in charge of 800 wounded men. "Seventeen hospital tents were pitched, and in these were placed all the most severe cases, about 75 in number," he wrote. "Under tent flies, I placed one hundred more patients, and the remainder were all under shelter tents. . . . Most of the wounds were from the conoidal [cone-shaped] ball, and a large proportion were in the lower extremities. The wounds generally granulated and took on a healthy appearance with great and unusual rapidity, which fact I attributed to the following circumstances: they were in the open air and exposed, for the first few days to a warm rain, they had plenty of good food, and flaxseed poultices were unknown."

In spite of the horrible conditions and lack of supplies, Billings as a doctor was beginning to be quite pleased with Army hospitals.



NATIONAL LIBRARY OF MEDICINE

Billings sought to apply the medical lessons but forget the personal suffering of the war.

Despite the horrible conditions and lack of supplies—at Gettysburg Billings's men had been obliged to borrow shovels from local farmers to bury the dead—Billings as a doctor was beginning to be quite pleased with these army encampment hospitals. The large tents, whose loosely fastened flaps allowed for a steady flow of air, seemed to have a therapeutic effect. The constant setting up and tearing down of his tent hospitals, often under artillery fire, tested his ability to respond quickly in any situation. The lessons he learned—indeed, the very outline of an army hospital—would appear later in his plans for Johns Hopkins.

After a break from field service in the New York area, Billings was back by the end of March 1864 with the Army of the Potomac, still bogged down between the Rapidan and the Rappahannock. In his new capacity as medical inspector, he was constantly on horseback, roaming the wide front and keeping a sharp eye on things everywhere. He collected medical statistics and records from the field hospitals, supervised the disposition of supplies and the transportation of the wounded from the field to hospitals, and operated as needed.

He also witnessed the battles of the Wilderness and Spottsylvania in May, and Cold Harbor and the siege of Petersburg in June—some of the bloodiest fighting of the war. His letters tell of total chaos, of surgeons working in their shirtsleeves in makeshift hospitals hastily assembled in tiny huts or under shelters of pine branches. The days were hot, sultry, and dusty; water was scarce and muddy. He wrote of cooking for 150 men in a single 14-quart kettle, of losing hundreds of thousands of men—15,000 in a single battle.

In spite of the terrible losses, the state of medical care had actually improved since the beginning of the war, when there had been few surgeons or hospitals and virtually no ambulance service. By 1865, when the war ended, the Union army had more than 200 hospitals with 137,000 beds. Letterman's ambulance corps—the envy of European armies—was in high gear, with medics braving battles to evacuate the wounded to surgeons' stations and field hospitals.

Something seemed to be right with wartime hospitals. Before the war, the few American hospitals had principally been repositories for the sick urban poor, many of whom died of fever or infection contracted while in the hospital. Most Civil War soldiers didn't want any part of hospitals, and some went to great lengths to

Anne Bennett Swingle is a Baltimore freelance writer.

THE WAR'S PERSONAL TOLL



The Union ambulance corps—here conducting a drill—transported the wounded from the field to hospitals.

Early in 1861, the young surgeon John Shaw Billings was contemplating entering private practice in Cincinnati when trouble began to simmer across the country. In February of that year, he boarded the regular sleeper and traveled to Washington, D.C.—an unsettling trip, as two Pinkerton men sat with drawn revolvers in the dark berths to either side of where he slept. Lincoln was inaugurated on March 4th, and in April the guns fired in Fort Sumter. It was Billings's 22nd birthday.

He would spend three years in the Civil War (two mostly in rear hospitals, one in the field), years that marked him indelibly. He started out with all the ebullience of a young surgeon at last given a free hand. With great excitement he described to his fiancée his treatment of the wounded of the Seven Days before Richmond in July 1862 at Cliffburne Hospital in Georgetown:

> I've received 200 wounded, and have been operating 24 hours steadily, shoulder joints and elbows joints, arms legs, etc. etc.—glorious opportunity to acquire a reputation and surgical glory but to use C.'s pet phrase, I am nearly crapulated. Hot—well I should rather think it was—perfectly boiling. . . . . Just as I had written thus far I was interrupted by the arrival of 125 more wounded.

By the following summer, the Battle of Gettysburg had sobered the tone of his letters:

> July 6th: I am utterly exhausted mentally and physically, and have been operating night and day and am still hard at work. I have been left here in charge of 700 wounded, with no supplies and have got my hands full. Our Division lost terribly—over 30 percent were killed and wounded. I had my left ear just touched with a ball and Dick's mane was cut in two places.

And then, in the spring of 1864, following the Battle of the Wilderness:

> May 12: Wounded are rapidly being brought in. . . . Some shelter was provided by clearing out the barns nearby and some was made of planks obtained from an old sawmill. It was raining heavily all the time and the wounded were chilly and faint. Stimulants were used freely. The supply of blankets ran short, as every man had lost his wet blanket and wanted a dry one. . . .
>
> May 12: 11 a.m. I have done a great deal of work within the last eight days and have learned many, very many things. I have been everywhere and seen everything. . . .

By the war's end, at 26, Billings had the experience—and much of the wisdom—of a much older man. Some noticed that the war had left its mark even on his appearance. Billings was tall and stood with soldierly erectness. He had a long, narrow head, and a bushy and very droopy moustache. His friend Weir Mitchell wrote in a biographical memoir that Billings "had large blue eyes with a faintly felt sense of that expression of melancholy seen often in men who carry through a life of triumphant success the traces of too terrible battle with the early difficulties of their early days."

In later years, Billings rarely, if ever, spoke about his role in the war. It was more or less a closed incident, and no one was permitted to discuss it in his house. On one occasion, a guest who did narrowly avoided being shown to the door.

Nor did Billings refer to the many friends he lost in the war. The two exceptions must have been especially affecting. One was the much-respected Major General John Sedgewick. Shot through the base of the brain by a sharpshooter, Sedgewick died five minutes after he had been brought into Billings's hospital tent. Billings named his only son (he also had four daughters) for Sedgewick.

He wrote wistfully about another loss—his boyhood friend Tom Allen, whom he came upon by chance near Todd's Tavern in Virginia on May 8, 1864:

> . . . and although the freckles were replaced by tan, and the blue uniform was very different from the college dress, otherwise there was little change. . . . I had changed more than he, and had to introduce myself, but when he once knew who it was, his greetings, and his invitation to have some coffee and port, were as cordial as in the old days.
>
> Five minutes of hurried question and answer to get the latest news of old schoolmates, a mouthful of black coffee from the tin cup, with a wish for his health and success, and we parted.
>
> An hour after that Tom's regiment was in the thick of the Spottsylvania fight, and at the next roll-call he was not there to answer.

conceal wounds or illnesses to avoid them.

But Union hospitals served more than a million men, and the death rate was less than 10 percent. It was true that disease—dysentery, typhoid, pneumonia, and in the South, malaria—claimed twice as many soldiers as did wounds, but the two-to-one ratio compared favorably to statistics of other recent wars. Gradually, the hundreds of thousands of men who stayed in hospitals, their families and friends, and public health authorities were beginning to realize that hospitals, if they were effective during war, could certainly be made more efficacious in peacetime.

IN THE EARLY 1870s BILLINGS, NOW assigned to the surgeon general's office, produced two reports that solidified his status as an expert in hospital design and public health. The first, "Barracks and Hospitals" (Circular 4), was a 527-page volume assessing U.S. Army installations. It summarized what had been learned in the war about ventilation and cleanliness. "We have the best-fed and the worst housed army in the world," Billings charged in his scathing introduction. Wards should be isolated from one another. Barracks lacked tubs for bathing; they were overcrowded; "arrangements for ventilation were either totally wanting or insufficient and unsatisfactory."

This was hardly news. The last three points—lack of cleanliness, overcrowding, and poor ventilation—had been marked as the culprits of "hospitalism" by mid-century. And the "pavilion plan" of isolating one ward from another had originated in a report to the French Academy of Sciences by J.R. Tenon a century earlier.

Billings's next report, only five years later, was an early American recognition of a new era: "On the Hygiene of the United States Army" (Circular No. 8), published in 1875, responded to Pasteur's germ theory, being widely circulated through British and American medical journals, that would revolutionize medicine. Joseph Lister's demonstration that minute bits of living matter caused infected wounds and contagious diseases was puncturing a widespread belief: that the unclean atmosphere, especially in a crowded hospital ward, provided a medium in which diseases grew like yeast in dough.

No pavilion system, not even the practice of tearing down barrack structures every 10 years, could avert hospitalism, Billings said in the hygiene report. "The real danger of hospitalism arises from solid particles, probably living," he wrote.

By 1875, when he began planning Hopkins Hospital, Billings was responding to the new germ theory of disease.

100 YEARS LATER

REVIVING BILLINGS' CURRICULUM?

A designer of curriculum as much as buildings, John Shaw Billings declared the goal of the Hopkins medical school would be to train doctors who could "not only sail by the old charts, but who can make new and better ones for the use of others." The method was to let students experience science and medicine first-hand, in the lab and on the ward.

In the ensuing decades, however, as medical knowledge has mushroomed, students in the first two preclinical years have spent more and more time in lectures and the library mastering that material. When a national Panel on the General Professional Education of the Physician (headed by Hopkins's Steven Muller) proposed in 1985 that medical schools curtail the passive hours spent in lectures, the Hopkins medical school set up a curriculum review committee.

The committee's report suggested reaffirming the original Hopkins philosophy of "learning by doing" by restructuring the curriculum to cut back on lectures, thus giving each student time to work on an independent research project and participate in a small seminar with faculty members. (A pilot group of students and professors has been testing this out this year.) The group also wants students to see more patients outside the hospital. The proposals have been much-discussed among students and faculty, and Associate Dean Simeon Margolis says, "All or some may be implemented."

"These organic poisons are necessarily more dangerous to others than to the one who produces them. The only available preventative then, is a more minute classification and isolation of contagious cases."

As Charles Rosenberg notes in *The Care of Strangers: The Rise of America's Hospital System*, the new theory seemed to reflect the grim lesson of the Civil War: No one, no matter how pure their lives or their environment, was immune from disaster. Good hygiene could deter, but never directly prevent, disease. "If you are standing on a plain across which a file of men are firing your chances of escape are of course better if there are but ten men shooting instead of one hundred," Billings analogized, "but if one of the ten does chance to hit you, the practical difference will probably not be appreciable."

That same year Billings produced his 46-page proposal for the construction, heating, ventilation, and administration of the Johns Hopkins Hospital and Medical School. "Whatever may be the opinions held as to the nature of these diseased germs, and their mode of origin and propagation," he said in his proposal, "they are what we have to fear and to provide against in the construction of a hospital. They are on and in the dressings, the sponges and instruments and apparatus, the bedding and clothing of the patients, the persons and clothing of the physicians and attendants."

To Billings, though, his growing acceptance of new ideas did not invalidate old ones, such as the importance of air circulation and good hygiene. His design of the hospital reflected pretty much the mid-century standard. By using the plan of isolated wards, Billings assured that contaminated air would not pass from one ward to another. The common wards, which were laid out one behind the other like a series of brick barracks, were connected by a single corridor that fed into each building's half above-ground basement. All entering had to climb a set of winding stairs to the outside of the corridor's roof in order to reach the ward's closed door. Patients on stretchers were carried up the same way.

Billings used no elevators, believing their shafts would only give infectious airborne particles a new path of entry. He avoided the accumulation of dust and dirt by substituting curved corners for rectangular ones. A thick coat of asphalt was applied to the floors of the basements to block poisonous vapors thought to arise out of the ground. He even recommended that the isolation ward have a few army-style

continued on page 122.



Billings worked on plans for the hospital in the library of his Georgetown home (below). Space and sunshine predominated, as the interior of the Octagon Ward shows (bottom). Long corridors connected the freestanding pavilions, whose roofs (left) allowed patients some fresh air.





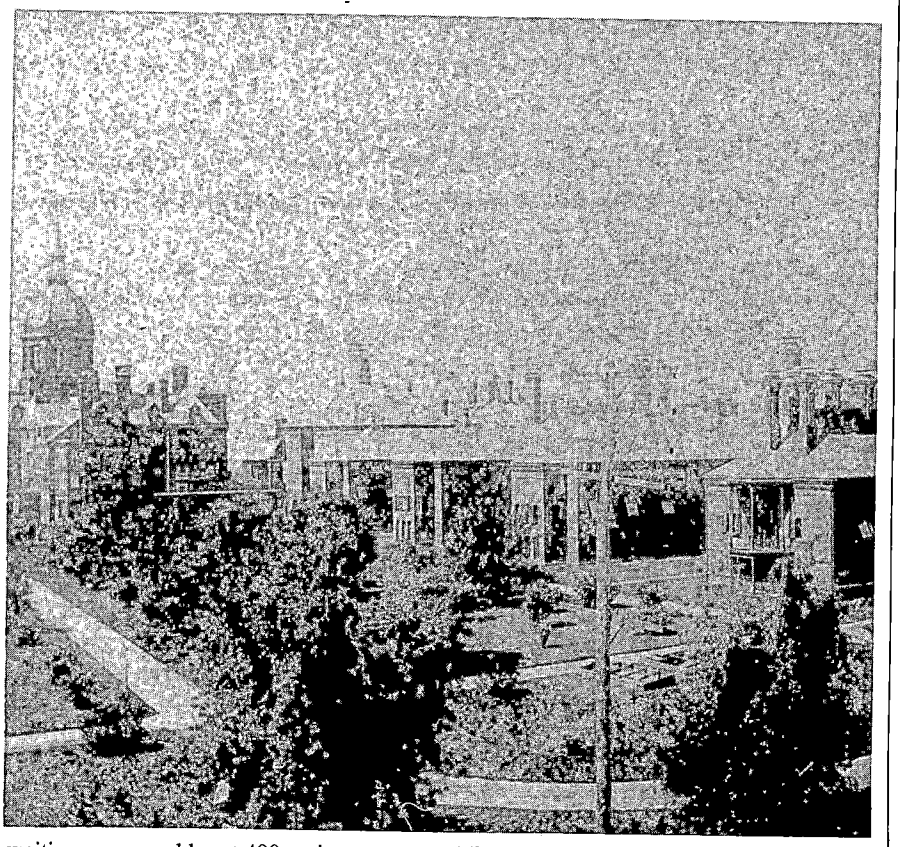
A DESIGN FOR HEALTH

John Billings's final plans for the Johns Hopkins Hospital, approved in April 1877, called for an administration building, two two-story buildings for private patients, two rows of five-ward pavilions arranged symmetrically on each side of a central garden, a kitchen and heating plant, a nurses' dormitory, an apothecary's building designed to hold the pharmacy, an amphitheater connected to a dispensary for outpatients, a pathological building, laundry, two bath houses, and a staff dining hall. Architect John Niernsee was chosen, along with the Boston firm Cabot and Chandler, to execute the design.

The original idea, as shown in the plan (facing page), was to have 400 beds divided among a dozen pavilions (10 separate public wards plus the two pay wards), all connected by ground-level corridors. The trustees decided to open the hospital before the southern row of wards was built; ultimately plans for these five wards, originally intended to house female patients, were scrapped (see plan, below right).

Designed for optimum ventilation and heating, the common wards measured 99.5 feet long, 26 feet wide, 15 feet high at the side and 16 feet high at the center. In each ward, there were 24 beds, each with 7.5 feet wall space and 107 square feet of floor area, and 1,769 cubic feet of air space. The large bay windows at one end formed a kind of sunroom. At the opposite end were small rooms for patients suffering from what Billings described as "nervousness or irritability" or "acute, febrile as well as critical cases that required modifications of light and temperature." The isolation ward was placed as far away as possible. The octagon ward was suggested by Niernsee as a way of increasing natural light and making economical use of floor space.

The amphitheater and dispensary were joined together and faced north on Monument Street. The amphitheater provided seating for 280 people. The seats, which resembled high-backed church pews, were, as Billings meticulously noted, fashioned of "three thin layers of birch wood, glued together and perforated with numerous holes, resting upon iron brackets, the fronts and caps being of cherry." The amphitheater, used mainly for lectures, also contained an operating room, etherizing room, recovering room, surgeon's room, a small ward for three beds, and an accident reception room with two beds. The dispensary waiting room could seat 400 patients.

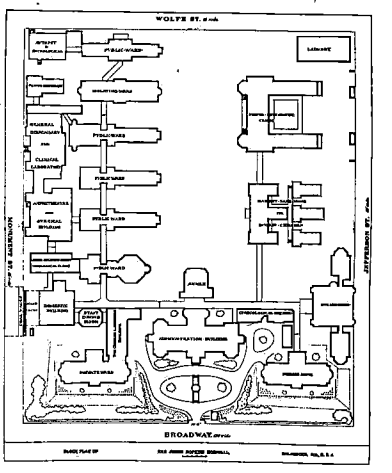


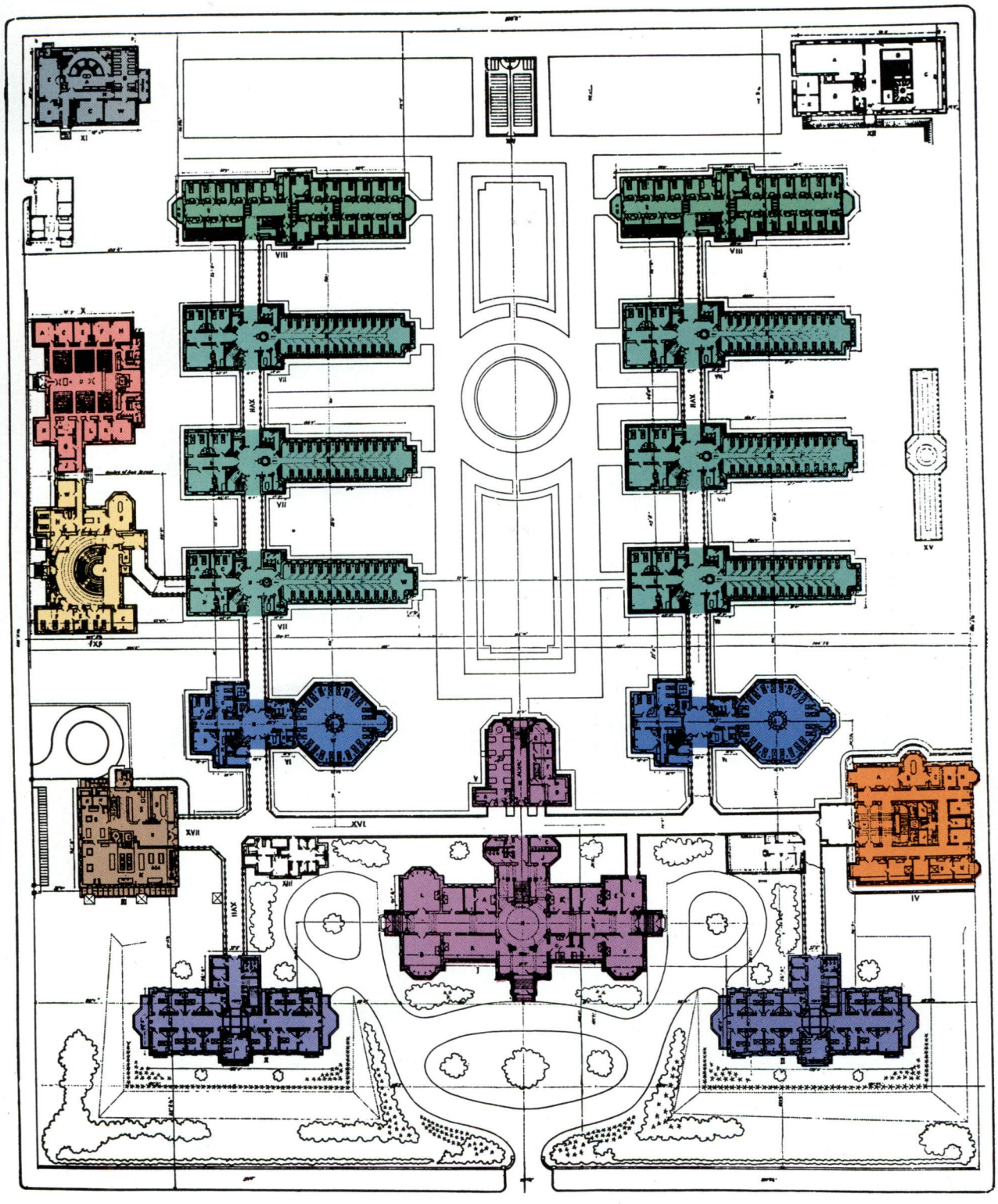
In the Nurses Home, near the female pay ward, a square ventilating chimney with walls two feet thick formed the building's central core. The dining room, training kitchen, pantry, lecture room, sewing rooms, and store rooms were in the basement. Living quarters for 25 senior medical students were located on the third floor of the administration building.

The male and female wards flanking the administration building were for private paying patients. Food for all the wards as well as hospital officers was prepared in the kitchen, conveniently connected to the main corridor. The laundry was placed as far away from the other buildings as possible, on the southeast corner of the property. On the northeast corner, the pathological building contained the morgue, a waiting room for friends of the dead, an autopsy theater, and laboratories.

The concept of separate buildings for surgery, clinics, and medical departments persisted through the building boom of the 1920s and into the 1970s. Thereafter, growing need to link services and move patients easily meant a shift toward connected buildings based on a horizontal plan. In 1977, the hospital declared Billings's pavilion plan officially at an end.

The original "block plan" for the hospital (facing page) called for symmetrical rows of pavilions separated by tree-shaded lawns. The open, highly organized design formed an impressive contrast to the haphazard arrangement of other contemporary hospitals. A shortage of funds prevented the south row of wards from being built, but the area soon began to fill up with the construction of the the Harriet Lane Home for Invalid Children (1912) and the Phipps Psychiatric Clinic (1913) as shown on the plan below. The administration building and private wards (now incorporated into the Marburg and Wilmer buildings) are all that remain of the original complex.

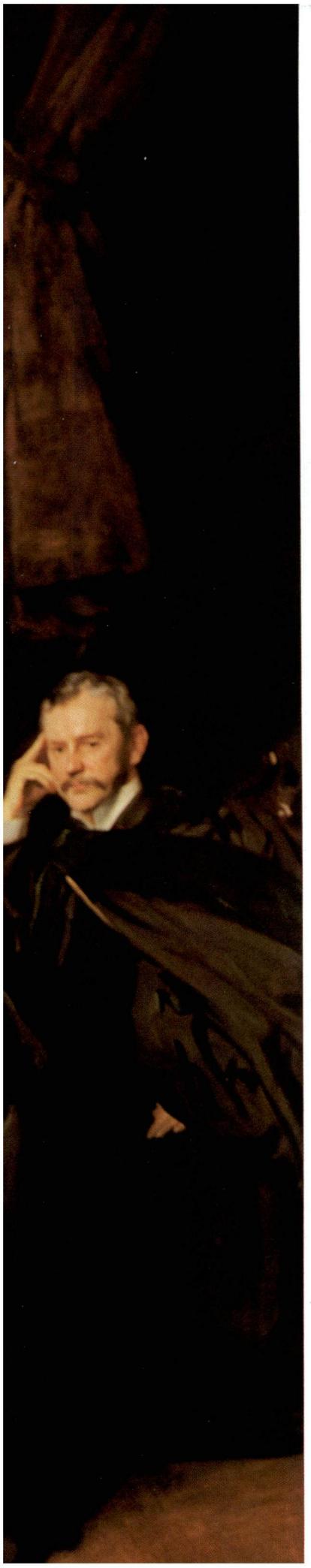




ORIGINAL BLOCK PLAN OF THE HOSPITAL
(the wards on the right were never built)

- Administration Building
- Pay Wards (men's at left)
- Octagon Wards
- Common Wards
- Isolating Wards
- Amphitheater
- Nurses' Home
- Dispensary
- Pathological Building
- Kitchen





THE FOUR DOCTORS

IN 1906 MARY GARRETT commissioned a group portrait of the "Big Four" from the prominent American painter John Singer Sargent. Presented to Hopkins in 1907, it has hung since 1929 in the Welch Medical Library, where a space was made in the main hall for the 11-by-14-foot canvas. William Welch sits at the left, holding a volume of Petrarch from Sargent's library; to the right are William Halsted (standing), William Osler, Howard Kelly. Although "The Four Doctors" became perhaps the best-known artwork at Hopkins, the artist himself struggled through the early sittings in his London studio, as Royal Cortissoz remembered in 1907:

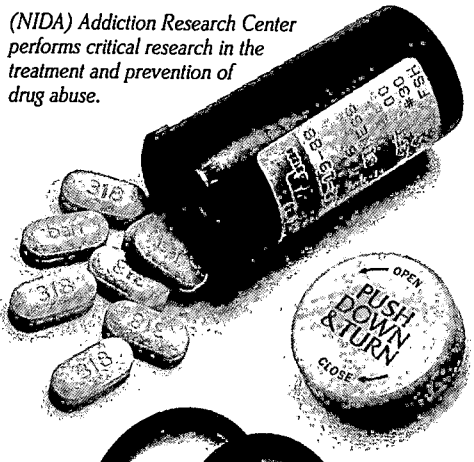
. . . Dr. Welch described Sargent as grouping his four sitters, over and over again, before he was satisfied. Sometimes he requested two of the doctors to stand, and then only one of them. He changed their positions, again and again. Before he began to paint, however, he settled upon the grouping that is shown in the completed portrait, and this, as Dr. Welch said, disposes of the assertion made by some critics that the composition had taken its form by accident and as the work proceeded. Dr. Welch also noted that the enlargement of the canvas by a piece joined at the side and another at the top was not unforeseen, but was mentioned by Sargent at the outset as a thing he expected to have done. The grouping, then, and the scale of the portrait were fixed by the artist when he began and so the sitters went on to do their part. They were sometimes all together in the studio, but not often. Sometimes three of them sat, sometimes two of them, but more often each doctor was posed by himself. Dr. Welch's head was painted practically in one sitting. He was struck by Sargent's unobtrusive way of studying him; he never felt that he was being closely scrutinized. Sargent talked constantly while he was at work, smoked innumerable cigarettes, and was always walking to and fro. When Dr. Welch asked him about his exercise, he said laughingly that he had once estimated that he walked about four miles a day in his studio. Though Dr. Welch's head was painted so quickly, the painter was not equally swift in his treatment of all the other sitters. Dr. Osler, especially, had to give sitting after sitting.

The work went forward, on the whole, with great smoothness. There were some difficulties, as when the portrait of Dr. Osler struck them all as a failure and Sargent painted it out and did it all over again. But then everything seemed to move swimmingly. Just at this time Sargent himself suddenly grew discouraged. He paused one day, and knitting his brow, and lifting his hand with a gesture of bewilderment, he said, "It won't do. It isn't a picture. I cannot see just what to do, but it isn't a picture." He stood for a little while thinking it over, and presently the clouds seemed to pass. He asked if there would be anything incongruous about the introduction of a large, old Venetian globe into the background. It was in his other studio, he said, and he would have it brought around if it were permissible. Of course it was; and a day or two after, the globe was there. It was so large that he had to have the doorway chopped to let it into the room. (That was very like Sargent; he would have had an entire wall removed if it had been necessary in making the portrait a perfect work of art.) When they sat again with the globe in the background Sargent studied the group with anxious interest, and then, in a swift stroke, drew the silhouette of the thing on the canvas. "We have got our picture," he said, and the portrait as it stands shows with that unerring instinct he had thought of the one thing fitted to serve his purpose. . . .

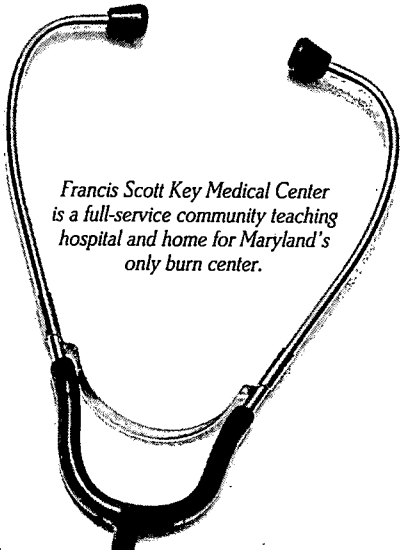
After A Century Of Preserving Life, We've Created A Center To Unlock Its Secrets.



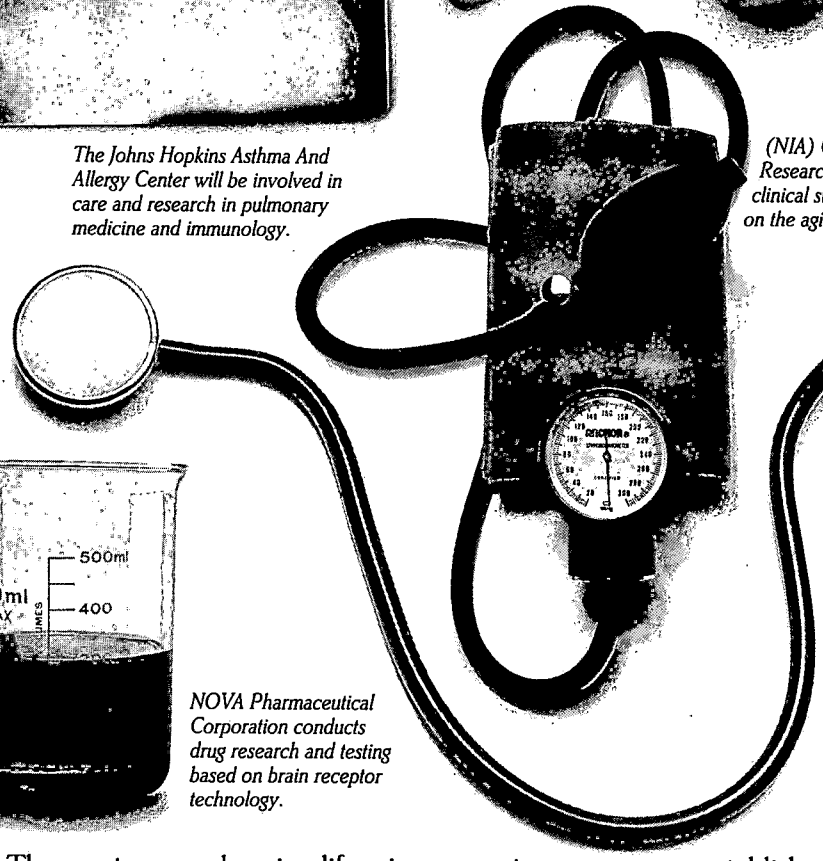
The Johns Hopkins Asthma And Allergy Center will be involved in care and research in pulmonary medicine and immunology.



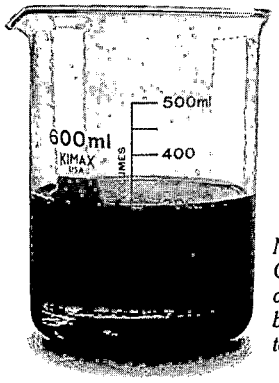
(NIDA) Addiction Research Center performs critical research in the treatment and prevention of drug abuse.



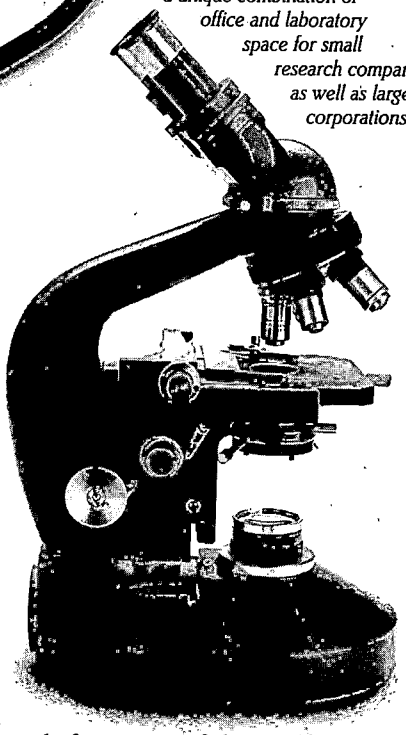
Francis Scott Key Medical Center is a full-service community teaching hospital and home for Maryland's only burn center.



(NIA) Gerontology Research Center conducts clinical studies and research on the aging process.



NOVA Pharmaceutical Corporation conducts drug research and testing based on brain receptor technology.



Triad Technology Center offers a unique combination of office and laboratory space for small research companies as well as large corporations.

The most comprehensive life sciences center in the region, Johns Hopkins' new Bayview Research Campus builds on a commitment that began a century ago. As the first name in medical research for more than 100 years, Johns Hopkins is proud to play a part in its creation.

Centrally located in the thriving biotechnology corridor between Washington and Philadelphia, Bayview boasts a spacious 130-acre Baltimore campus that is already home to six major research establishments. And with its outstanding facilities, Bayview offers even start-up firms the grounds for successful growth.

One hundred years does wonders for one's view on life. Now the latest wonder of Johns Hopkins' lasting vision, the Bayview Research Campus marks a new step in understanding the secrets of life itself.

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HOPKINS BAYVIEW RESEARCH CAMPUS

"YOUNG MEN WHO WOULD BE HEARD FROM"

By Marjorie Centofanti

Armed with the scientific method, investigators who trained in the labs of Martin and Welch advanced American medical research beyond taboos and speculation.

HENRY NEWELL MARTIN'S lab, the site of Hopkins's earliest physiology research, had state-of-the-art equipment: Two commodious wooden benches dominated the lab, five microscopes perched on a side counter, ready with a flick of the mirror to focus light from a bank of tall windows. Shelves held glassware, galvanometers, wind-up kymographs, spectroscopes, and heavy metal induction coils.



In the 1870s, even less-than-splendid laboratories were a rarity in America; teaching young men the scientific methods to do research was rarer still. Hopkins's planners broke all precedent when they sought an overseas-trained physician to plan their biology course, gave him carte blanche to set up a physiology lab, and paid him handsomely to leave his practice and do research and teaching.

At the time Martin's lab was set up at the Howard Street site of the new Johns Hopkins University in 1876, studies of biology, physiology, pathology, and pharmacology—all fields that would push medicine forward—continued to take a back

seat to clinical practice throughout America and Europe. Hopkins historian A. McGehee Harvey writes that there was neither time nor incentive for a physician to engage in scientific research. In fact, researching was a liability since "anyone who withdrew from practice would lose his position on the ladder leading to key teaching positions and practice opportunities." The way to advance was not to offer medical insights via research, but to wait for your predecessor to die. Just as important, few saw any value to medicine from basic research.

What biological science there was in America stressed morphology—the structure of organisms—and natural observation. Elaborate explanations were woven around observations to account for diseases or an organism's workings. Taboos about human dissection and ignorance of scientific method strengthened the hold of these "natural philosophies." Prominent naturalist Edward Cope, for example, felt professionally threatened by Martin and other physiologists who studied the organism's process and function, not structure.

In Europe, meanwhile, the scientific climate was two decades ahead. An intellectual revolution coupled with development of the first real scientific technology—better microscopes, for example—had helped to spawn laboratories in physiology, chemistry, pharmacology, and pathology. Much of the activity was in politically decentralized Germany, where competing universities wooed professors with well-equipped labs and intellectual freedoms. Within a single lifetime, from about 1820 to 1880, medical science moved from the speculative and philosophical to concrete ideas of cells, specific tissues, organs with known functions, and diseases with known causes and characteristic pathology.

Naturally, these ideas overflowed their German boundaries. But they were unusually slow coming to America. Hundreds of American physicians returned from Europe bearing the seeds of new research techniques, only to find barren ground when they came home. "I am often asked how it is that many good [American] men who do well in Germany and show evident talent here are never heard of and never do any good work when they return," pathologist William Welch wrote to his sister from Leipzig in 1878. "The answer is that there is no opportunity for, no appreciation of, no demand for that kind of work."

BUT ONE AMERICAN WAS IN A POSITION to transplant a piece of the German system to America: Daniel Gilman, the first president of Johns Hopkins University. After his graduate studies in Berlin, Gilman had returned to write about European research in American journals. He had helped organize some of the country's earliest premedical courses as part of Yale's Sheffield Scientific School.

Now, with an eye on the planned medical school in Baltimore, Gilman set out to staff the new medical school with "young men who would be heard from." So a cadre of young American researchers, most of them trained in Europe and elated at the unheard-of chance to get a salary for teaching and research at home, came to Baltimore. To lure Martin, Gilman used the same attractions as German universities: well-equipped labs and funds to publish discoveries—much more important than "simply offering double pay," he believed.

Martin, an Irishman, had graduated from the University of London and apprenticed himself to a London physician before receiving a scholarship to Trinity College, Cambridge. He became the first there to get the doctor of science degree in physiology. He also became a key figure in the rapidly growing school of natural science, partly because of the fervor of his teaching.

The spark that kindled Martin at Cambridge was undoubtedly British biologist Thomas Huxley, Darwin's foremost advocate and popularizer. Martin assisted in Huxley's unique elementary biology course—unique because students learned by direct experiments and contact with specimens rather than formal lectures. With Huxley's supervision, Martin wrote a biology text that for decades remained the standard for college biology classes.

Once in Baltimore, Martin drew a steady stream of students with the premed and graduate "Chemical-Biological Program" he set up. Associate professors taught morphology and comparative anatomy, freeing Martin for physiology and research.

As an early American physiologist, Martin was also among the first to encounter a controversy that his field might never escape. Antivivisectionist J. Rendel Harris, who taught at Hopkins, resigned in 1885 to protest Martin's work. "I do intend to employ vivisection in my experiments," Martin told detractors; "however, no painful experiment will be performed, because of anesthesia, and none but competent people will undertake such experiments."

Martin's own elegant and simple research dealt mostly with the physiology of mammalian hearts—drugs, temperature effects, and the like. He did some of the early studies on an isolated heart-lung sys-

Hundreds of American physicians returned from Europe bearing the seeds of new research techniques, only to find barren ground when they came home.

100 YEARS LATER

RESEARCH CAN STILL BE A LUXURY

Not until the early 1900s did even Hopkins give research a firm place in clinical medicine. Less than a century later, things have threatened to come full circle: "Recently," explained medical school Dean Richard Ross in a speech last year, "competition and regulation pushed junior faculty to see more patients and, hence, they had less time in their lives for science."

Moreover, most investigations are no longer paid for outright by the supporting university or hospital, but by government and private grants. Yet with government cutbacks, grants are harder to get. The situation—though for different reasons—has overtones of the 1850s.

At Hopkins, the Clinician Scientist Program has relieved some of the pressure. Selected junior faculty receive awards of up to $50,000 annually for two years, from both institutional and private sources, allowing them to develop research projects and seek ongoing outside support. The program has produced about 40 investigators in ophthalmology, caridiology, immunology, oncology, endocrinology, and genetics.

Ironically, the program has received half its funding from the School of Medicine's clinical practice income—fees collected for patient care by faculty. Although the marketplace and productivity affect the individual amounts, Hopkins medical faculty remain on salaries.

BRINGING THE BENCH TO THE BEDSIDE

In the 1830s Army surgeon William Beaumont had a patient whose stomach, through accident, had an external opening. Taking advantage of the unusual situation, Beaumont did experiments in his spare time on his patient's digestive abilities.

He uncovered phenomenally accurate new information about digestion. But because it had no apparent application—and Beaumont had no special reputation—"no university offered him a professorship, no medical school invited him to lecture," writes Hopkins historian A. McGehee Harvey.

At the end of the century, the first laboratories for basic medical sciences had appeared and salaried researchers (at Hopkins, at least) were exempt from clinical duties to focus on their discoveries. Yet their clinical colleagues were stalled in Beaumont's era—without time, salary, or recognition for research.

Even at Hopkins, scientific medical research was the exclusive domain of the preclinical scientists. Compared with research in basic physiology, pharmacology, and the like, clinical research was a poor relation. Hopkins had no laboratories for in-depth clinical studies. The clinical faculty, who had patient loads both within and without the hospital in addition to their teaching, had no time to do research.

Another probable reason was that research was still too basic to do much good. Other than aseptic surgery, the laboratory had provided little to improve therapy. Digitalis, quinine, and opium still dominated treatment, as they had 50 years earlier. Clinicians, it was thought, would advance by improving their powers of observation and interviewing. "The insights of the postmortem room and microscope offered little to the practicing clinician," writes medical historian Charles Rosenberg. "It might be interesting to establish the characteristic appearance of a diseased liver that killed one's patient, but such knowledge offered little guidance in treating similarly afflicted patients in the future."

Hopkins physician-in-chief William Osler, to his credit, saw that students learned the latest laboratory techniques to examine patients' secretions, excreta, and blood as part of hospital routine, but this was for diagnosis, not for understanding disease.

Yet growing numbers of newly trained clinicians, whose coursework now wisely included research techniques and scientific method, began to view their specialties with researchers' eyes. They were interested in the effects on the body of increased pituitary secretion, for example, or the effect of increased food intake on typhus patients.



From the beginning, the latest laboratory techniques were used to examine patients' secretions and blood, but until this century this was only for diagnosis, not for understanding disease.

If medicine were to advance at the same pace as basic science, something had to close the widening gap between the lab bench and the patient's bedside. Welch, now dean of the medical school, and Mall, who pronounced the differences between clinician and researcher "disappointing," said the solution was to give clinical researchers a salary—pay them to leave their practices and become scientists. This had worked well in the preclinical labs.

But there was opposition to the idea within the hospital. Some argued that the full-time clinician-researcher would be poorer, from cutting out patient fees, and sadder, from losing touch with the sick. Others questioned the necessity of research. Finally, in 1904, the arguments pro and con became fixed on the issue of who would succeed Osler as director of medicine and physician-in-chief when he left for Oxford—whether to choose Osler's favorite or bring in new blood.

Osler was a master observer of patients, a humanist who once gave his only overcoat to a sick man in the street, and a firm believer in medicine as an art. "But there existed in his clinic no great incentive to learn about the fundamental nature of disease. The belief was that medicine was basically different from biology, chemistry or anatomy and could only be studied by different methods," wrote Rufus Cole, a resident of both Osler and his successor.

Enter the modern view, championed by Lewellys Barker. Unlike Osler, Barker had considerable experience in laboratory research. He worked beside Osler, Welch, and Mall for eight years, finally becoming associate professor of pathology. He was also an authority on the nervous system, teaching neuroanatomy and taking leave to Germany at intervals to improve his skills. For a time, he was professor of anatomy at the University of Chicago.

The controversy that swirled around Barker and Osler had more philosophical overtones than a disagreement about salaries of clinician-researchers. It smacked of *The Two Cultures*, of art versus science, of nascent fears that science was dehumanizing, of "pure" versus "applied," and of tried-and-true versus the new.

Strangely, Barker had little experience caring for patients—a vast contrast with Osler—and, Harvey says, he had no outstanding talent for research. But he knew the value of applied science and had the drive to make others see it as well.

After a minor political coup, which briefly made the Baltimore *Sun*, Barker succeeded Osler. One of his first acts was to organize three separate clinical laboratories, headed by full-time clinical scientists. Within three years, Hopkins had new laboratores for clinical physiology, biology, and chemistry. They were low-budget affairs, and not all the researchers were full-time, but the labs were significant enough to spark a new field of clinical science and bridge the troubled waters between pure and applied medicine.

tem. In a test of the effect of alcohol on dog hearts, Martin chastised other would-be scientists: "All sorts of alcohol-containing drinks have been administered to men or animals, and the results set down as due to alcohol only. This is not justifiable . . . for it is well known that in different wines and spirits, various substances are present which have potent action on the system."

The statement would later seem sadly ironic because Martin, slated to head physiology at the medical school, became ill from chronic alcoholism just before it opened. He resigned and returned to England, where he died at age 45.

But Martin had trained others to take his place. His lab launched some of the country's first full-fledged medical researchers and physician-researchers. He conveyed to his students his own meticulously rigorous approach, and made them study the normal before the pathological. With the advanced students, observers accused Martin of using the "sink or swim" approach.

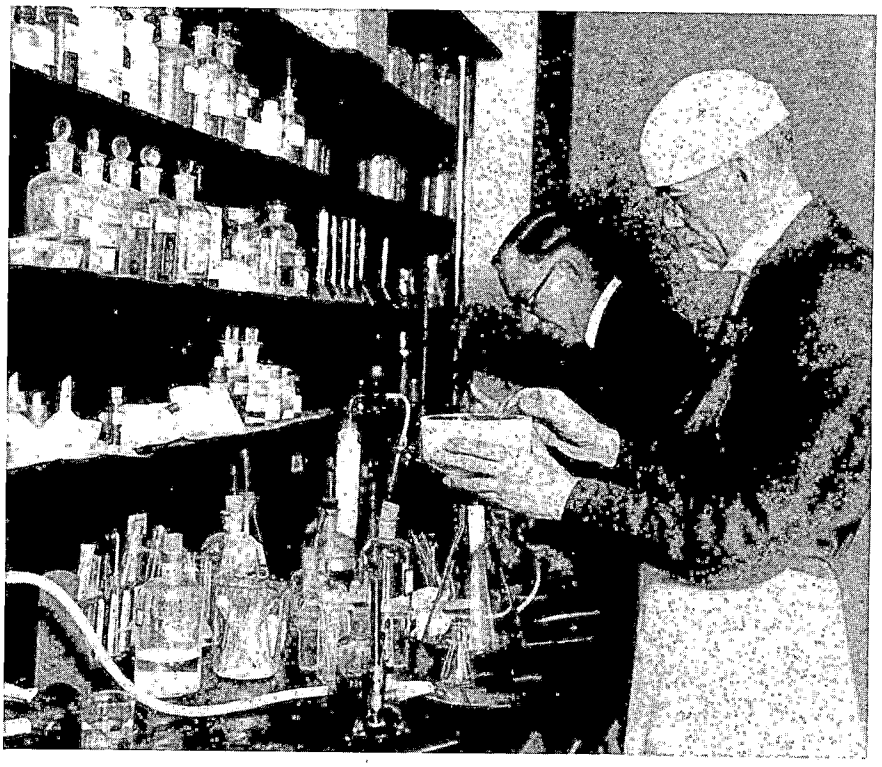
Yet many students thrived on the independence, including William Henry Howell and John Jacob Abel, who became Hopkins professors when the medical school opened.

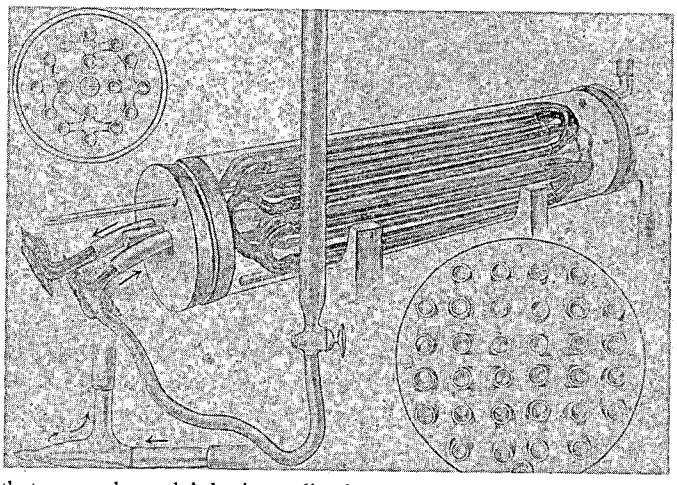
Howell was the preclinical faculty's native son. Born and schooled in Baltimore, he got his European grounding, once-removed, in Martin's course. After studying blood coagulation in a year of graduate work with Martin, Howell, at 24, taught physiology in the new building on Eutaw Street. He left Hopkins briefly, but returned to become the first physiology professor in the medical school.

Howell's major contribution was in helping to unravel the mystery of blood clotting. He isolated a sixth element necessary for clotting, thromboplastin, and was the first to realize that a substance (now called heparin) isolated by one of his students, Jay McLean, was a natural anticoagulant.

Abel was spurred by his work with Martin to spend the next seven years in Europe studying with the best physiologists and pharmacologists of the time. Then, after a brief stint as chair of *materia medica* at his alma mater, the University of Michigan, he returned to Hopkins. In 1893 he set up the first modern department of pharmacology in America, replacing traditional lectures with laboratory experience. The dozen or so experiments his students performed were not manufactured exercises, but original studies testing the theories of the day on the mechanisms of drug action.

Abel was known for encouraging a free exchange of ideas among faculty and fellows at informal daily lunches. He argued that research needn't be immediately practical, that sometimes studies be done "not because they give promise of immediate value to the human race, but because they make an irresistible appeal by reason of an inner beauty."





John Jacob Abel (above, foreground) argued that research needn't be immediately practical. The diffusion apparatus he designed (left) had no clinical application at the time, but it aniticipated kidney dialysis.

A thin, rather birdlike man, Abel would lean over the lunch table, holding up for all to see bits of bread he'd rolled into cylinders. They represented part of the diffusion apparatus that carried out what he called vividiffusion, a precursor of renal dialysis. Blood from an animal would pass from an artery through a series of tubes of differentially permeable membrane surrounded by salt solution and back into a vein. It would be two decades before the method saw the light of day clinically, but Abel's device shed immediate light on the composition of blood.

More than the other original medical faculty, Abel was, in his early years at Hopkins, regarded as something of a visionary. But he also compiled a mass of research with immediate application. His experiments with phthalein derivatives, for example, produced the first test of normal kidney function. He was the first to isolate a hormone from an endocrine gland—a form of adrenalin from the adrenal medulla. Later, he was the first to isolate a crystalline form of insulin.

WILLIAM HENRY WELCH HAD wanted to become a teacher of Greek, but somewhat reluctantly followed his father into medicine. He was on this second course at the College of Physicians and Surgeons in New York when, by dint of some well-done reports on lectures he heard

there on nervous diseases, he won a prize—a microscope. It was like giving Hector his first suit of armor. The newly invented oil immersion lens was making the smallest bacteria visible, and anyone with a good microscope could hold his own with Koch or Pasteur.

Less than a year later, in 1875, Welch asked his father to send him to Europe to study. Among others, he worked in the Leipzig laboratory of the great Carl Ludwig, who developed the idea of secretion of urine by osmosis and the idea of perfusing organs to keep them alive. Working next to students of all nations, Welch picked up both methods and outlook: "I have learned from Prof. Ludwig's precept and practice that most important lesson . . . not to be satisfied with loose thinking and half proofs, not to speculate and theorize but to observe facts closely and carefully."

One night in 1880, in the German rathskeller where Faust was said to have met with the Devil, Welch met John Shaw Billings, who was then designing Hopkins Hospital. Although the hospital staff wouldn't be recruited for another four years, Billings was very much interested in Welch's career. When Welch returned to New York four years later at age 33, he set up a pathology lab at Bellevue. Shortly thereafter, he came to Hopkins.

In fall 1886, he began teaching pathology and bacteriology, assisted first by William Councilman and then by Councilman and Franklin Mall. They had the latest in microscopes, a microtome, and staining baths to work with. Councilman often went to the Bayview Asylum, the city almshouse and hospital, to get materials from autopsies for Welch's classes. He'd bring back the specimens in pails swinging from the handlebars of his bicycle.

When he taught, "Welch would deliver a twenty or thirty minute talk on the subject of the day," student Simon Flexner wrote, "then his assistant would distribute sections to be stained and mounted. These were studied under the microscope, while Welch went from one man to another, explaining what each saw. I was enthralled. Welch's introductory talks were such a marvel of lucidity that I never tired of hearing them. . . . He never used notes, nor did he look up the subject beforehand, for his constant wide reading kept him always up to date."

Once again, a young Hopkins professor could be accused of neglecting his students. Welch did not establish a common theme for the laboratory, instead permitting his fellows and assistants to go their own way unless they wanted advice. This benign neglect was often disquieting—"Welch seemed hardly aware of my existence," Flexner wrote—but it was intentional. Welch said that medical school students generally were overtaught and that "promising investigators were often spoiled."

Of all of Hopkins's earliest preclinical faculty, Mall was probably the best researcher—focused, inspired, and tireless.

Welch's own research was most notable in bacteriology and, like that of his fellows, wasn't confined to a single topic or two. "He didn't show any special fertility in the choice of problems for himself; his choices . . . were determined by fortuitous circumances," Flexner commented.

The most famous instance of Welch's experimental serendipity occurred in 1891 when a body was brought to autopsy after an aneurysm of the aorta. During the autopsy, Harvey relates, "Welch noted a peculiar swelling of the skin over the neck, arms and chest, which on pressure gave forth a crackling sound. The veins of the skin were easily visible and contained gas. . . . Welch nicked one of the exposed veins, to which he then held a lighted match. The escaping gas ignited with a slight explosion and burned with a pale bluish flame, demonstrating that it was not air." In the surrounding tissues Welch found hundreds of short bacilli, which he subsequently cultured in animals. In these new hosts, the bacteria also produced gas: Welch had isolated the cause of gas gangrene. His discovery proved especially significant during World War I, when a high incidence of the pathogen in battle wounds led to development of an antitoxin.

Welch's lab was a magnet for budding researchers: Among "Welch's rabbits," as his fellows and assistants were called, were more young men who would be heard from, both in and beyond pathology. While still in the lab, Councilman and Henri LaFleur found the cause of amoebic dysentery. Arthur Blachstein found that people could be chronic carriers of typhoid bacilli. Simon Flexner mapped out the pathology of diphtheria toxin and the pathogen of amoebic dysentery.

Franklin Mall had met Welch in Ludwig's lab. When Welch offered him a fellowship in pathology at Hopkins, Mall jumped at the offer, even though it wasn't his specialty, because he knew there were no other research jobs in America. Once in Baltimore, Mall taught the anatomical part of pathology, but his first love was research.

Of all of Hopkins's earliest preclinical faculty, Mall was probably the best researcher—focused, inspired, and tireless. Between 1886 and '89, Mall mapped out much of the structure and function of the stomach and intestine—where secretion takes place, how blood vessels are arranged, the nature of peristalsis (the rhythmic contractions of the digestive tract). Later he made key discoveries on the circulation of the spleen and the liver and created a research institute for embryology.

Some of Mall's most shining work was done in Welch's lab in collaboration with William Halsted, later to become Hopkins's most respected surgeon. Halsted incorporated Mall's ideas on the strength of the fibrous submucosa of the intestine in his development of the first suture. Sutures in certain tissues, Halsted found, were more likely to become infected than in others. Likewise, sutures in other tissues pulled out easily. Together Mall and Halsted worked out the surgery of the intestinal wall.

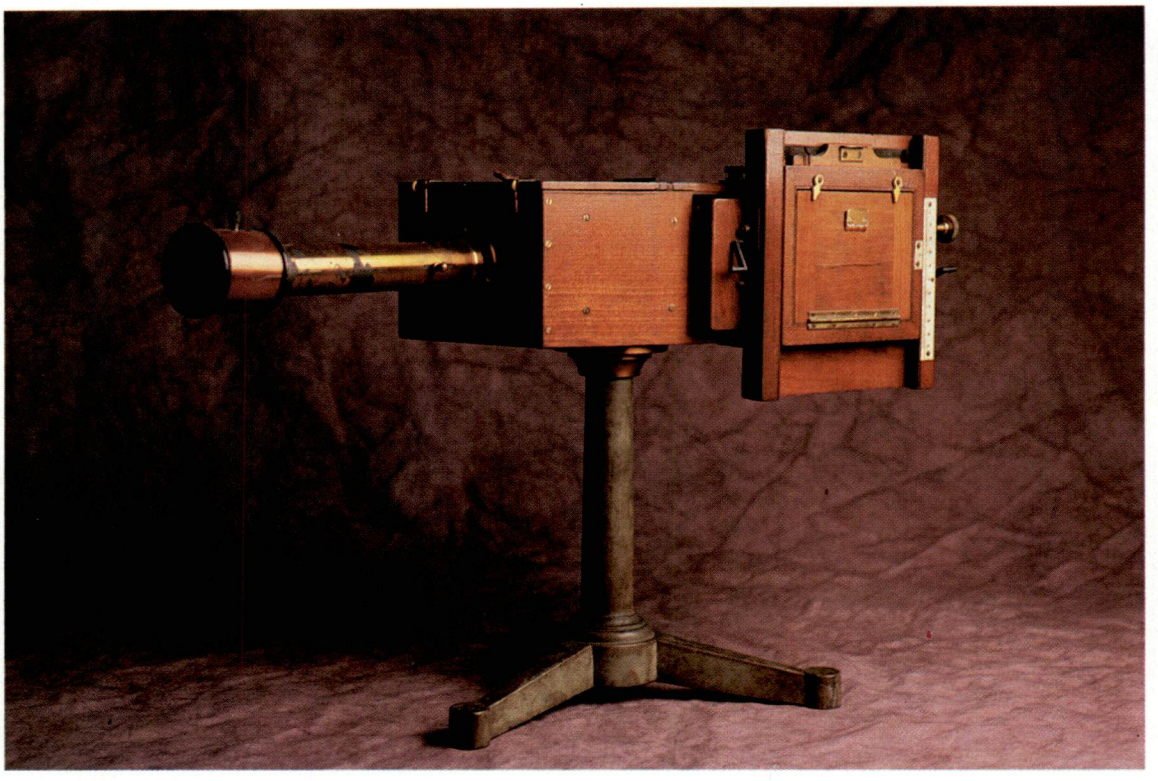
BY THE TURN OF THE CENTURY, all four preclinical departments were well-staffed and active. The pace of basic medical research at Hopkins was brisk. Physiologist Howell, pharmacologist Abel, anatomist Mall, pathologist Welch, and his assistant Councilman had come together and reached a critical mass.

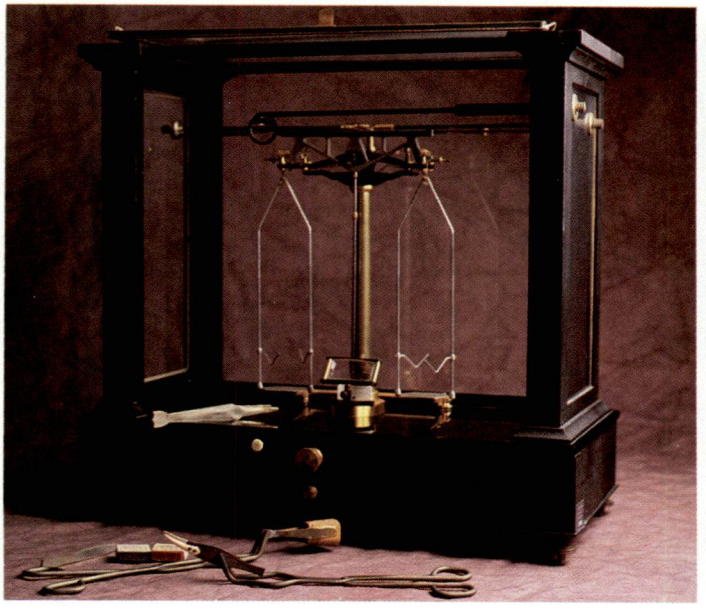
They worked side by side, ate dinner together, critiqued each other's research, and shared journal articles with what one onlooker called a "delightful intimacy." When one of them had a particularly knotty problem, they'd all thrash it out in the lab or over beer at Hanselmann's Bar on Monument Street. The explosion of research and resulting charged atmosphere supplied Hopkins and the rest of the country with well-trained researchers who changed medicine from art to science. ■



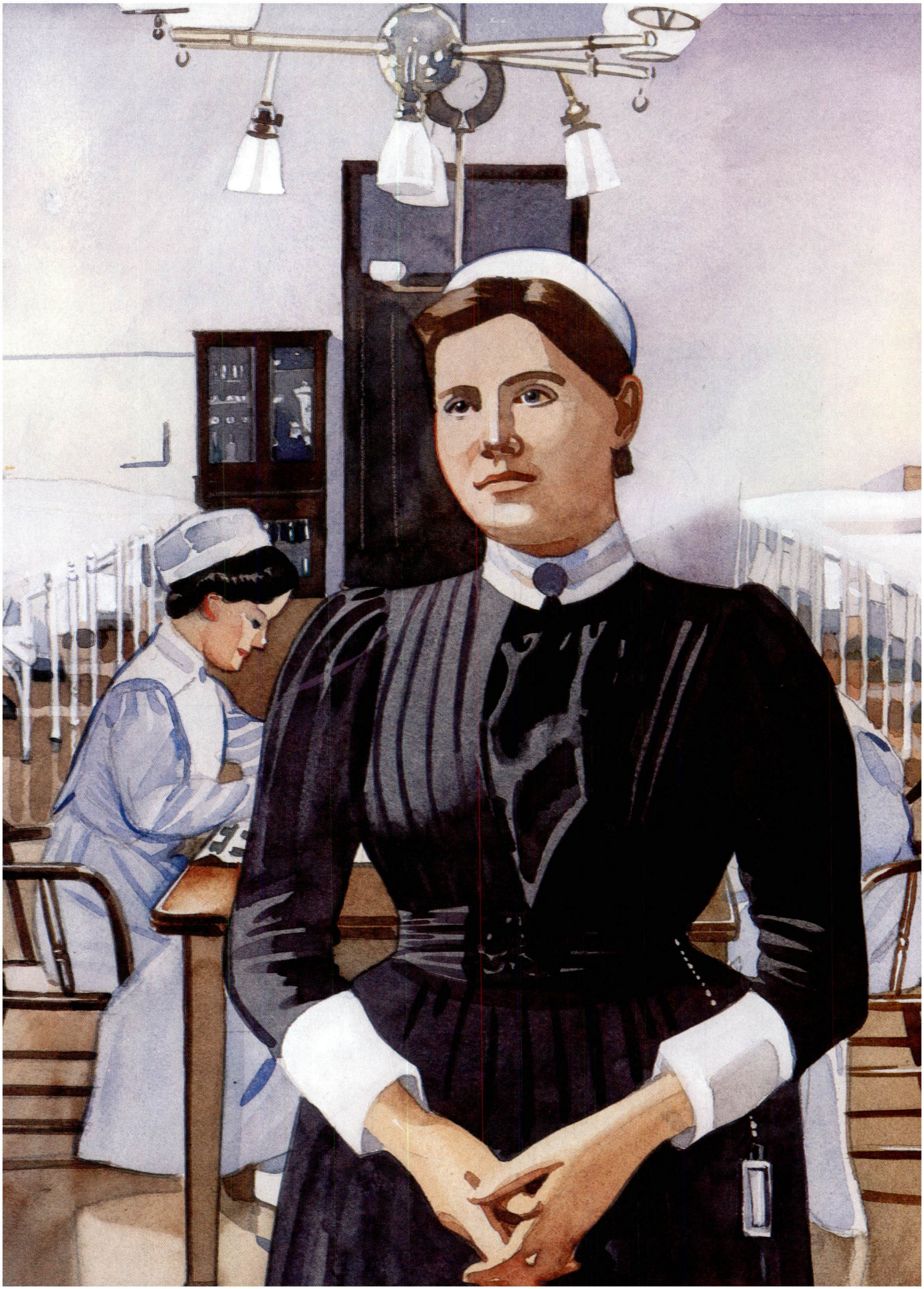
IN THE LABORATORY

In 1893 John Jacob Abel established at Hopkins America's first modern pharmacology department, emphasizing first-hand experimentation over theory. While teaching students the fundamentals of laboratory science, he developed a working model of a "vividiffusion" (kidney dialysis) machine. He also isolated the first crystals of insulin and epinephrine (adrenalin). Many artifacts from his lab survive, including an R.J. Beck microscope (opposite page) with its case, extra lenses, and lens cleaners. The refractometer (below), in which a beam of light is used to analyze sugars, works on the same principle as those still used in food laboratories. The drawer of the semimicrobalance (bottom left) held tweezers for handling its minute counterweights. The lab's copper-and-brass distilling equipment (bottom right) included a pan (foreground) manufactured in Baltimore. Photos by Grace Zaccardi.









HOURS OF DUTY

BY JULIA RIDGELY

Isabel Hampton and the other founders of the School of Nursing helped lead the fight for less work and more education for student nurses.

THE STUDENTS WHO MET in the parlor of the Nurses' Home for prayers were preparing for a grueling day that would begin at 7 a.m. and might not end for another 16 hours. Yet 10 minutes of tranquillity was enough to draw inspiration from their principal, Isabel Hampton. "It was always a new sensation to see her," her colleague Lavinia Dock wrote, "serene and beautiful, enter the room with her prayer-book in hand after the whole staff had taken its place and this impression was not lessened when I learned later that she had sometimes dressed in three and a half minutes. . . . When I think of the Hospital now, it is always this picture that I see—the nurses streaming down the corridor, the green lawn, and young trees outside in the sunshine (the sun always shines in Baltimore), and Miss Hampton's caryatid-like figure, clad either in black or white, her large eyes radiant with pride and joy in her flock. . . . Almost always, as we turned away, she would say to me with perhaps a little squeeze of the hands, 'Docky, aren't they nice?' "

The peace ended quickly as the students hurried off to begin their 7 to 7 shifts. First-year students were posted to the wards to learn their duties under the eyes of the head nurses. Second-year students might be sent to care for private patients (the hospital collected their fee) or to perform "district nursing" among the poor of Highlandtown. An hour off was allowed for meals and study, and twice a week classes were held between 5 and 6 p.m. From 8 to 9 p.m., Hopkins doctors periodically gave

In addition to keeping up with their studies, student nurses performed catheterizations, and applied dressings.

lectures on subjects ranging from ventilation to anatomy—36 lectures in all in 1889-90, the school's first year. Hampton lectured whenever her other duties permitted.

In contrast to college or even medical programs of the time, the "training school" may have seemed to demand a great deal of work in exchange for a little teaching and the token "allowance" students received for their expenses. Yet the Hopkins program put together by Hampton was already in the forefront of nursing education simply because it made an effort to instruct. The trained nurse had been seen in America only since the first schools opened in 1873, but had already accomplished much: providing skilled care for the poor in hospitals, serving the rich in their homes, creating for women what Hampton called "a profession which is unquestionably womanly." But hospitals had begun opening schools to provide a pipeline of cheap, skilled labor, saving money on paid nursing while providing scanty, haphazard instruction.

Before training schools, nursing had been the duty of women in their own homes or, for the rich, of hired private nurses. The poor were forced to look to hospitals for care from unskilled and undisciplined assistants, who helped contribute to the "hospitalism" from which many patients died. During the Civil War, however, many middle- and upper-class women volunteered to nurse the wounded. At the war's end, they joined the movement to replace unskilled assistants with trained nurses and provide a respectable vocation for young women. Their inspiration was Florence Nightingale, who had become a near-legend because of her work in field hospitals during the Crimean War.

For Nightingale, nursing was not a profession but a calling. In her mind, women who chose to dedicate their lives to nursing service were expected to possess more than the usual degree of such "feminine" virtues as selflessness, dedication, obedience, and morality, all of which would be enhanced through education. Like the precise rows of beds that lined the wards in her hospital plans, Nightingale's nursing system had a military order. The chain of command ran from pupil nurses up through graduates, head nurses, and superintendent. At the top was a board of "Lady Managers" operating outside the authority of the hospital.

Few American hospitals adopted the system, preferring to place nursing schools under the power of their own boards. With little financial incentive to change, the task of fighting for more instruction, more scientific content, and a better-organized program would be left to leaders like Hampton. Critical to their success would be sympathetic administrators: At Hopkins, a first step had already been taken by university President Gilman, who made the principal of the school and superintendent of nursing into a single position, as he had done with clinical and teaching positions at the medical school. Overseeing both the small nursing staff and the students would give Hampton added authority.

The choice of Isabel Hampton out of almost 100 candidates was also a promising sign. A graduate of Bellevue—one of the few Nightingale-style schools in the country—Hampton, as head of the Illinois Training School, had overhauled the program, adding more frequent, scheduled classes with more instruction in basic medicine. With her large, blue eyes and widely noted beauty, she was also an attractive professional model; Dock remembered clearly "that serious, dignified, sympathetic yet restrained manner so characteristic of her, which instantly struck me as the perfection of bearing for a nurse."

The trustees had even been willing to wait until October 1889 for Hampton to free herself from her duties. Along with her record, her opening address made her view of the student nurse more than clear: "It is not so much the great amount of work that she can accomplish practically that is desired, but the kind of work, and to render unto each patient under her care nursing in its best and truest sense." Just as the hospital would be looked to for the best in scientific study, "this school may be looked to for what is best in nursing, and her graduates uphold their part of a grand work with all faithfulness."

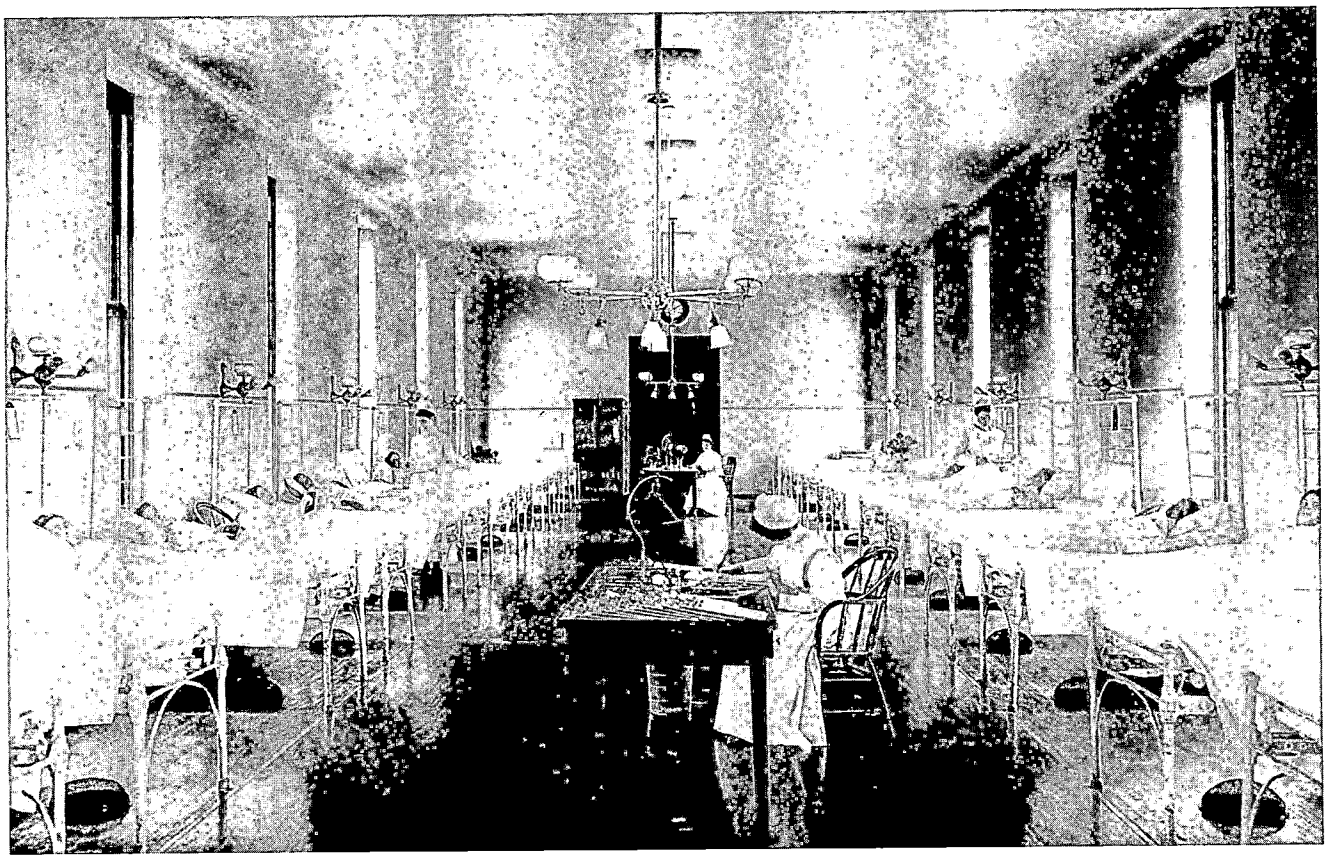


THE DIET SCHOOL

As superintendent, Isabel Hampton constantly searched for ways to broaden the experience of nursing students. In April 1890 she brought in Mary Boland, a graduate of the Boston Cooking School, to organize a program to teach the theory and practice of the "sick diet." It may well have been the first such program in the country.

Two students at a time would spend a month in the hospital kitchen, fixing breakfast in the private wards before preparing, under Boland's eye, some of the 150 dishes included in the course. Among them, Hampton wrote, were "beef teas, broiled meats, steaks, chops and birds, gruels, porridges, mushes, drinks, jellies, toasts, soups, broths, oysters, eggs, potatoes, custards, sherbets, creams, frozen fruits, cordials, salads, koumiss and all simple dishes."

The afternoon was devoted to teaching on subjects like "the cooking of water; the mineral and organic matter in the same; albumen; and the methods of serving food." At the end of the month, students took an oral exam, answering such questions as "Why is bread, improperly toasted, unwholesome?" and "What is the chemical composition of an egg?" Boland, who was accorded the status of a head nurse, also administered part of the final exam, and followed the example of Hopkins's nursing leaders by publishing a textbook, *A Handbook of Invalid Cooking*.



Since the wards lacked nursing stations, nurses filled out their reports at desks between the 12-bed rows. Right: a 1915 anatomy class taught by Dr. Florence Sabin.



THE FIRST CLASS SEEMED WELL PREpared for the challenge; the 17 students included many private and seminary school graduates, several former teachers, and an MA with "three years in Greek." The level of education far exceeded hospital planner John Shaw Billings's prophecy that American recruits would not even be, like British nurses, from "the class from which the better kind of English domestic servants are obtained." Among them was the mostly self-taught Adelaide Nutting, a 30-year-old from East Waterloo, Quebec. In mid-September she had written to Hampton, describing herself as "five feet, five inches in height. . . . Though not remarkably strong, I have a good deal of endurance." With brothers and a sister now fully grown, and a father who "though elderly is not an invalid," she had decided at last to pursue a long-held dream of being a nurse and applied to what the Montreal *Weekly Witness* had described as the most up-to-date and best-equipped hospital in the country. Isabel Hampton had not waited to reply. In spite of Nutting's honest statement about her lack of strength, her letter indicated an absolute commitment to nursing. Given the nature of the program, Hampton knew, nothing less would do.

In addition to keeping up with their studies, the pupil nurses also bore a tremendous responsibility for the hospital's patients, mixing drugs, performing catheterization, and applying dressings. In 1890 there were only eight graduate nurses on the staff—six head nurses, one operating-room nurse, and one dispensary nurse—but 36 students, who performed virtually all the day-to-day tasks, from wrapping bandages to fixing breakfast for patients in the private wards. Indeed, the most common diseases, like typhoid, had no treatment other than careful nursing that allowed natural recovery. The near-obsessive concern with sanitation added an enormous burden of drudgework. Hampton's classic text, *Nursing: Its Principles and Practice*, instructed, for example, that the nurse responsible for the room of an infectious patient should wipe all the furniture daily with a cloth wrung in carbolic acid, rub the floor with a damp cloth every other day, hang damp sheets in the line of air currents, and wash the patient's clothes in soapsuds and carbolic solution.

Students could be required to work draining 12-hour night shifts. Nutting—whom Isabel Hampton knew to be somewhat frail—had been at Hopkins only a few weeks when, she recalled, the superintendent "came down to the ward on her morning rounds and bent over me at the table where I was making my patient's chart and said quietly: 'You are to go on night duty tonight. I have kept you from it as long as I can.' " Pupil nurses also served in Ward I, the dismal "isolating ward" where delirious patients as well as those with contagious diseases were kept. To prevent the spread of infection, they were required to spend a full week at a time inside the huge brick building. Not surpris-

continued on page 123.

THE PRICE OF ADMISSION

By Lavinia Edmunds

Mary Garrett and friends dictated unprecedented admission standards for the medical school with an offer the trustees couldn't refuse.

IN 1890 A CATASTROPHE loomed over the fledgling Hopkins model. Increased competition meant dwindling profits for the Baltimore and Ohio Railroad, in which Johns Hopkins had left 15,000 shares. As of 1876, the stock earned $150,000 annually, which seemed adequate to fund university and hospital buildings, teachers' salaries, and the future medical school. But from 1888 to 1891, the B&O paid no dividends. There were rumors that the university would close, and the medical school seemed a far-off dream.

Plans for the School of Medicine already had attracted a core of superb teachers, but without students or a building, they were growing restless. William Osler, who had thrived on teaching medicine at McGill and Pennsylvania, hinted that unless something were done he might be forced to go "where there were some real medical students." And now an anonymous donor tried to lure Osler back to McGill, his alma mater, with the promise of a $1 million endowment.

To President Gilman, the alternatives appeared bleak. Prominent Baltimore citizens, contributing $5,000 each, raised an emergency fund of $108,700, and the legislature contributed enough to keep the university going. But Gilman calculated that he needed a $500,000 endowment to open the medical school. He had quickly quashed a makeshift plan put forward by the trustees in October 1889, insisting that it placed dreams for a superior and innovative medical school in "imminent danger." Rather than offering rich opportunities for work



in the lab and with patients, the plan called for a series of paid lectures. It was a money-making scheme, in the worst tradition of American medical schools of the time *(see box at right)*.

The university's desperation spelled opportunity to a group of five young, well-bred Baltimore women. Well aware of the university's dilemma—four were daughters of university trustees—they launched an audacious plan to save the medical school: They would raise $100,000 toward the endowment *if* the school would admit women.

The five had grown up together and shared social connections, a proper Victorian background, and a love of education and literature. In the 1880s, meeting on Friday nights in their palatial Mount Vernon homes, the ladies would discuss literature and—more and more—the ideal of equal educational opportunities for women.



COURTESY OF BRYN MAWR COLLEGE ARCHIVES

M. Carey Thomas strongly influenced Garrett's ideas and strategy in the Hopkins campaign.

The group's philosophical leader and strategist was M. Carey Thomas (daughter of trustee James Carey Thomas), who was to become a well-known educational philosopher. Mary Elizabeth Garrett, daughter of the late B&O rail magnate and Hopkins trustee Robert Garrett, would supply money and business sense. The others—Bessie King, Mamie Gwinn, and Julia Rogers—had joined with Thomas and Garrett in founding the Baltimore Bryn Mawr School for Girls in 1885.

Thomas, who was by now dean of Byrn Mawr College, near Philadelphia, suggested the hospital might be open to their gift even with its string, writing to Garrett in April 1890 that the hospital, having depleted the funds for the medical school and controlling all salaries, "stands like a dog in the manger preventing all action. The strain of affairs is so great that I think our $100,000 wd prob. enable the Univ. to begin in a small way; but of course it would not enable it to begin right. It needs $500,000 sep. endowment bec. a higher sch. can never pay for itself—the higher the standard the lower the numbers."

Most American schools thought it improper to have women in classrooms with men studying indelicate subjects like anatomy and pathology.

On May 2, the five women organized formally as the Women's Medical School Fund Committee. Through savvy politicking and use of connections, they formed a nationwide movement to support the medical school that would admit women. By that fall, they raised $63,512 through a network of committees set up in 15 cities. Garrett added $47,787.50.

Although Gilman called the contributions "a noble act," the attached string must have seemed to him less lofty. In his inaugural address, he had opposed exposing women "to the rougher influences which I am sorry to confess are still to be found in colleges and universities where young men resort."

Thomas, trying to get her doctorate in Greek from the new Johns Hopkins graduate school, was allowed to take examinations and be guided by university professors, but she could not attend classes. According to one story, she was allowed to sit in on Professor Basil Gildersleeve's Greek class if she sat behind a screen. She eventually got her PhD summa cum laude at the University of Zurich.

Most American medical schools of the time thought it improper to have women in

FLEXNER ON OTHER MEDICAL SCHOOLS

At many medical schools at the turn of the century, getting a medical degree was as easy as paying your tuition bill. In his scathing report of 1910, Abraham Flexner documented the prevalent low standards. "Bulletin Number Four," funded by the Carnegie Foundation for the Advancement of Teaching, led to reforms around the country—most modeled on the Hopkins medical school, which Flexner lavishly praised for its high standards of admission and curriculum.

Medical education, Flexner wrote, had become "a demoralizing experience . . . from which it is but now painfully recovering." It got off track with "the rapid expansion of the country, with the inevitable decay of the apprentice system." Medical colleges "have multiplied without restraint, now by fission, now by sheer spontaneous generation. . . .

After visiting 155 medical schools, Flexner reported, "The schools were essentially private ventures, money-making in spirit and object. A school that began in October would graduate a class the next spring; it mattered not the course was two or three years. . . . Income was simply divided among the lecturers who reaped a rich harvest. . . . No applicant for instruction who could pay his fees or sign his note was turned down. State boards were not as yet in existence. The school diploma was itself a license to practice. The examinations, brief, oral and secret, plucked almost none at all; even at Harvard a student for whom a majority of nine professors 'voted' was passed."

A Hopkins graduate, Flexner attributed the incisiveness of his report to his knowlege of Hopkins. "I had a tremendous advantage in that I became intimately acquainted with a small but ideal medical school embodying in a novel way, adapted to American conditions, the best features of medical education in England, France, and Germany. Without this pattern in the back of my mind, I could have accomplished little."

classrooms with men studying indelicate subjects like anatomy and pathology. The *Medical Record* warned that if the Hopkins trustees took the gift, it would "seriously impair the prestige and limit the usefulness of the university's medical school."

Thomas, meanwhile, used her father as a pipeline of information on trustee developments. He also advised on strategies, by a roundabout route: In Baltimore James Carey Thomas would telegraph his daughter in Philadelphia, who would telegraph Garrett in Baltimore about how to proceed. In one letter Thomas advised Garrett "to say nothing til those of us that are on the inside track have fd. out wh. way the matter will be decided. No special meeting must be called until Mr. [Charles] Gwinn, Mr. [Francis] King & my father have assured six votes beforehand." On October 28, the trustees accepted the Fund gift, but decided to open the medical school only when the full $500,000 was in hand. So the women resolved to continue their campaign.

ON NOVEMBER 14, TWO MAJOR SOcial events promoted by the women's fund furthered the impression that anyone who was anybody was supporting the cause. A reception at the hospital drew 200, and later 1,500 attended a soiree at Garrett's mansion. Both events were chaired by First Lady Caroline Scott Harrison, and all the national newspapers gave generous coverage. Harrison, in a claret gown trimmed in pearls and lace, greeted guests at the Garrett house, its Tiffany windows and carved wood walls aglow in the candlelight. Reported the Baltimore *Sun*, "Cardinal Gibbons was present in his scarlet robes, accompanied by Vicar-General McColgan. . . . Nearly every citizen of Baltimore known to society responded to the invitation."

Despite all the fanfare, by December 1892 the fund had raised only an additional $15,000. Even with some funds from other sources, the trustees were still $306,977 short of the $500,000 endowment. Garrett supplied it. This time she threw in another surprising condition, specifying more rigorous admissions standards than any medical school in the United States: Male and female candidates would be required to have a bachelor's degree, proficiency in French and German, plus a strong background in chemistry and physics.

Garrett insisted on such tough criteria partly to ensure that the first women students would have sufficient academic background to succeed at a pioneering medical school. But she also apparently believed the requirement would gain the support of Dean William Welch. Welch had earlier, somewhat wistfully, advocated similar requirements—never expecting them to be implemented. "She naturally thought this was exactly what we wanted," Welch wrote to his colleague Harvey Cushing in 1922. "It is one thing to build an educational castle in the air at your library table, and another to face its actual appearance under the existing circumstances."

In fact, Welch was worried that very few prospective students would qualify and apply to such an exclusive medical school. But Thomas pointed out that Bryn Mawr College, after all, had 170 undergraduate women, "everyone of whom has passed our examination for reading French & German. It is folly to suppose that men cannot do the same at a much more mature age." Thomas also warned that Columbia and Pennsylvania, which were considering similar requirements, could eclipse Hopkins. Even so, Osler and others objected to binding the school to Garrett's specifications over a long period (Garrett had pledged to take back her gift if at any point its conditions were not upheld).



Mary Garrett (c. 1910) gave little ground in her negotiations with Hopkins trustees.

During January and February 1893, as the trustees tried to change Garrett's mind, tempers wore thin. "The trustees get so angry in their meetings they fling brickbats at each others heads," noted Thomas that February. Finally Garrett agreed to change a few words to allow for special circumstances. On February 22 the university announced that the medical school would

continued on page 125.

Ironically, while their victory set the standard for medical school admission, it was a mixed victory for the women who had taken the battle so personally.

100 YEARS LATER

ADMISSIONS STILL A HOT TOPIC

Hopkins continues to lead the nation in reform of medical school admissions with two recent innovations—the dropping of the required entrance examination and FlexMed, a flexible admissions program. Both are designed to attract students with broad backgrounds.

Although the humanities emphasis falls within the tradition begun by Mary Garrett, her requirements have been changed to fit the times. The language requirement has been dropped, although liberal arts coursework is still required.

In 1948 Hopkins adopted the Medical College Admission Test (MCAT), the major arbiter of medical school admissions throughout the country. But potential medical students have grown too obsessed with MCAT scores, to the detriment of their education, says assistant dean for admissions Norman Anderson. "Students lightened course loads, avoided participation in extracurricular activities, to cram and study for MCATs."

Hopkins dropped the MCAT requirement in 1985, but so far other schools aren't following suit. The MCAT, though, has just been revamped to test more critical and verbal abilities.

FlexMed, adopted by Hopkins in 1983, also reaffirms the value of liberal arts background in the education of the well-rounded physician. It allows students to to defer matriculation for up to three years, "so students can plan that other life experience," says Anderson. "Students are returning with experience and skills desperately needed in medicine."

TEACHING

HALSTED MUMBLED, KELLY HANDLED SNAKES . . .

What some students remember most about teaching at Hopkins had little to do with medicine.

Some students never understood Franklin Mall. They mistook his belief that teachers should also be students—not taskmasters—for laziness, and his refusal to lecture for apathy. Others relished the academic freedom. Alan Gregg recalled his first experience of Mall's lab (as recorded by Saul Benison):

"On arrival at the Hopkins I wandered into the anatomy building. I saw a very sharp looking person with very intelligent eyes there in the hall. . . .

"This individual was Franklin P. Mall, whom I didn't know from a hole in the wall. He gave me about fifteen minutes of talk about what Johns Hopkins was, I left in a perfect storm. I wanted to sign on so much. I went out into the street and I saw . . . a fellow I had been a counselor with up in a YMCA camp in my freshman year. He looked at me with astonishment and said, 'Why Alan Gregg, what the hell are you doing here?'

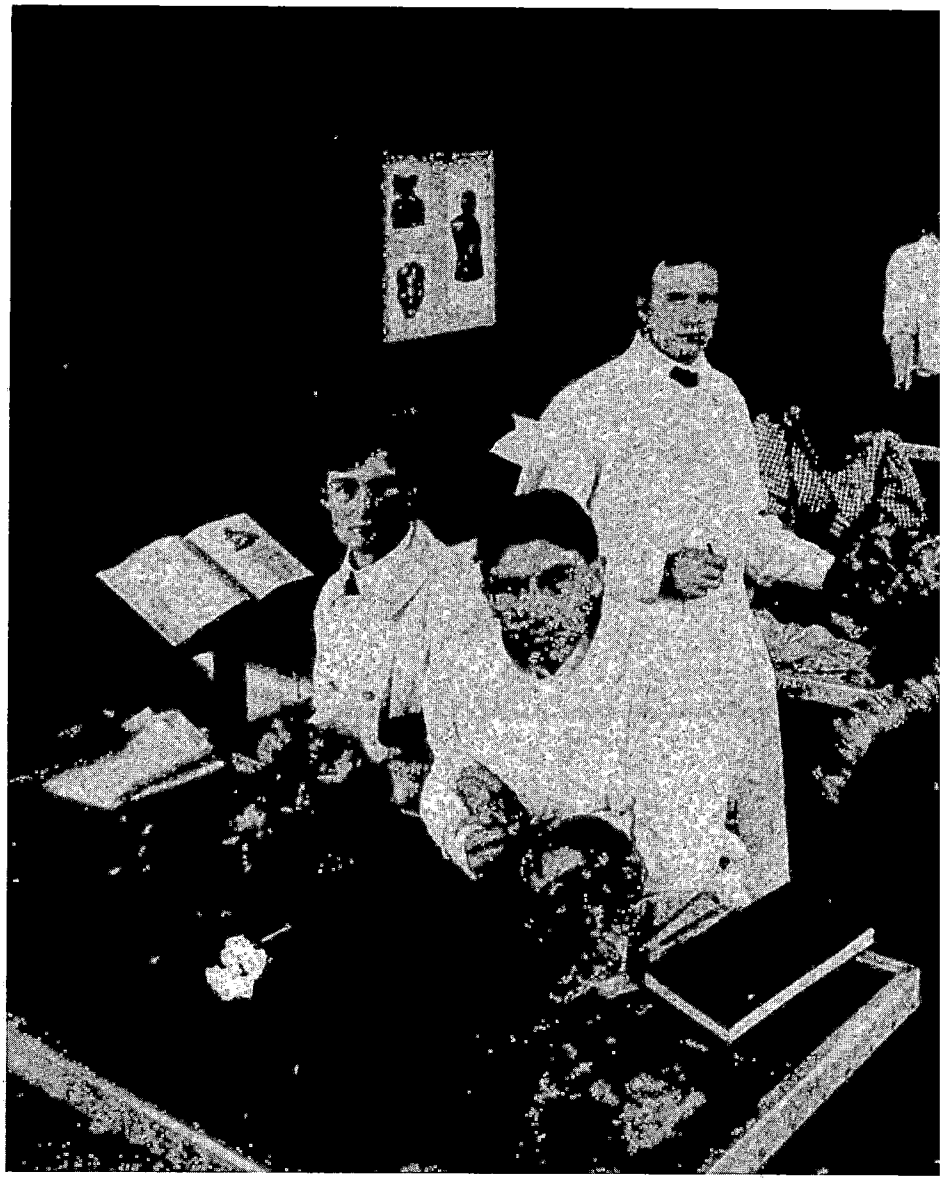
"I said, 'Why, I am trying to make up my mind what medical school to go to.'

"He said, 'You come here. You won't make any mistake. We have wonderful professors. In physiology there is Howell. Popsy Welch is in pathology. Then there is Thayer in medicine.' He was all enthusiastic, and then he added, 'All except one son of a bitch.'

"I said, rather guardedly, thinking that it would be a good thing to know early on, 'And who is that?'

" 'He thinks he's our professor of anatomy. His name is Franklin P. Mall. I'll just tell you what he did to us. The first day he met us in anatomy he said, "Gentlemen, the dissection room will be open from nine o'clock in the morning until ten at night except on Saturday afternoon when you ought to go out and get some exercise anyhow. Up until six o'clock there'll always be somebody to get you out of any tangles you get into. I can recommend the three following textbooks, and when you are ready to take the examination let me know." 'Now,' said my young friend, 'If you can beat that son of a bitch of laziness in a professor you're going some.'

"Mall has stayed in my mind as a good example of excellent teaching completely wasted on a badly prepared student mind. This boy I spoke of just missed Franklin Mall by yards and yards and yards. I privately think that Mall's teaching was designed for and appreciated by A No. 1 students, but that Mall had an appalling mortality because so many of his students thought, 'Well, he must be interested in golf or something. He isn't teaching.' "





Students in the operating amphitheater (above) strained to hear Halsted. The glare from the room's large window made the surgeons below seem like shadows. Below: Franklin Mall's do-it-yourself anatomy laboratory.

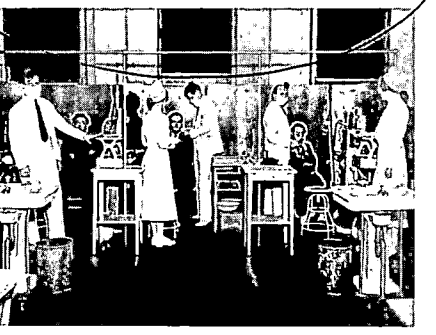
William Halsted, the elegant, soft-spoken professor of surgery who sent his shirts to Paris for laundering, taught his students to "put ideas to experimental tests, and to apply those that seemed sound to surgical practice," wrote G. Canby Robinson. Unlike Osler and Kelly, Halsted was not a riveting lecturer, wrote George Corner in his autobiography, *The Seven Ages of a Scientist*. At times, Halsted was barely audible: "Lecturing in the old surgical amphitheater he spoke in tones so low that he could scarcely be heard in the upper seats, and even down front he seemed at times to be mumbling to himself." Students watching from the top rows saw much of Halsted's back, and little of the operations. But somehow they learned from seeing the master surgeon operate how to be painstaking and precise, to minimize bleeding and trauma to body tissues.





Howard Kelly, appointed professor of obstetrics and gynecology at age 31, "came nearer to being a genius than any other man on the medical faculty," wrote G. Canby Robinson. "He had an extraordinary range of interests, besides being a brilliant surgeon almost from the day he finished his internship in the Episcopal Hospital in Philadelphia." Kelly's avocations included botany, astronomy, geology, linguistics, and the study of reptiles. Once, in a dramatic lecture using live poisonous snakes, Kelly demonstrated how a rattler sinks its fangs into prey, how it "rotated the maxillary bone inwards so as to bring [the fangs] violently toward the gullet," ejecting a few deadly drops of "clear yellow poison."

A religious, industrious man of great vigor, Kelly hated idleness. It was said that he rode a motorcycle to the hospital; to save time, he had an arrangement with the proprietor of a grocery store on his route, recounted Robinson. "When he rode by with a shout, the grocer would telephone to instruct the hospital to start giving ether to the first patient to be operated upon, for Dr. Kelly was on his way."



George Corner found room for improvement in the teaching he got at the dispensary (above).

In the early years, the major exception to high teaching standards at Hopkins was the dispensary, or outpatient department, wrote George Corner. "Its waiting room was a dismal place where ailing people sat on benches awaiting their turns to see the doctor. The examining rooms were equally dismal . . . The quality of instruction varied with the instructors, from that of experienced practitioners like [internist] Louis Hamburger and [dermatologist] T. Caspar Gilcrist to that of a young ophthalmologist whose teaching was so inadequate that some of us were moved to complain to the dean."

The Johns Hopkins Hospital Bulletin.



Volume I.—No. 1.] BALTIMORE, DECEMBER, 1889. [Price, 15 Cents.

MEDICAL INSTRUCTION IN THE JOHNS HOPKINS HOSPITAL.

During the year 1889–90, instruction will be given at the Johns Hopkins Hospital in Pathology and Bacteriology, Medicine, Surgery, Gynaecology, and Hygiene, by lectures, demonstrations, laboratory courses, bed-side teaching and general clinics in the laboratories, wards, dispensary, amphitheatre and private operating rooms.

1. PATHOLOGY AND BACTERIOLOGY.

Pathology.

The instruction in Pathology is under the charge of Dr. W. H. Welch, Professor of Pathology, Johns Hopkins University, and of Dr. W. T. Councilman, Associate in Pathology and Associate Professor of Anatomy, Johns Hopkins University. It is conducted in the Pathological Laboratory, which is one of the buildings of the Johns Hopkins Hospital, especially constructed for pathological work. Here are to be found an autopsy theatre, rooms for bacteriological and special research, rooms for pathological histology, experimental pathology and photography and a museum.

Courses of instruction in Pathological Histology are continued throughout the academic year. In connection with the course in Pathological Histology fresh pathological specimens are demonstrated and also studied microscopically, especially by the aid of frozen sections. Instruction is also given in the methods of making post-mortem examinations and of recording the same.

Much attention is given to the collection and study of material in Comparative Pathology.

The resources of the laboratory are open to those who are fitted to engage in special investigations in any department of pathology.

In addition to regular practical courses in the laboratory extending throughout the academic year, special courses of lectures on pathological subjects will be given during the months of January and February, 1890. Professor Welch at this time will lecture once a week upon the Pathology of Diseases of the Heart and Blood Vessels. The subjects of fatty heart, fibrous myocarditis, diseases of the coronary arteries of the heart, thrombosis, embolism, infarction, and endarteritis, will be considered.

Professor Councilman will lecture upon Inflammation. The modern doctrines of inflammation, the origin of pus, the behavior of fixed cells in inflammation, the relation of bacteria to inflammation, are among the subjects to be considered. The lectures will be illustrated by gross and microscopical specimens.

Bacteriology.

The instruction in Bacteriology is under the charge of Professor W. H. Welch and of Dr. A. C. Abbott, Assistant in Bacteriology and Hygiene.

The rooms for bacteriological work are in the Pathological Laboratory. They are supplied with all of the apparatus required by modern bacteriological methods, such as those employed in the Hygienic Institute in Berlin. The laboratory has a full set of cultures of pathogenic micro-organisms, and of others useful for study and teaching.

Opportunities for studying bacteriology are available for students during the entire academic year, the laboratory being open on week days from nine o'clock in the morning until six in the evening. As much time can be given to the work as the student has at his disposal.

In the bacteriological course the student becomes familiar with the preparation of the various culture media, with the principles and methods of sterilization, and with the morphological and biological characters of the micro-organisms which belong to this

CHARTING THE "ISLANDS OF LANGERHANS"

By Lynn Crawford Cook

As the boundaries of science rapidly expanded, early Hopkins journals mapped the way for medical explorers.

IT WAS NOT BY accident that Hopkins became a center for medical discoveries. It had the first American system to give doctors the luxury of doing paid research. What they did with that luxury endures to this day. Dust off some early issues of the medical journals started at Hopkins, and you'll find a record of a new science struggling to invent itself. The excitement of the period is palpable in the writing.

Things were happening so fast that in-house journals were needed just so the pathologists would know what the bacteriologists were doing down the busy corridors. And because there were so few places to publish medical research outside Europe, doctors from other institutions were eager to publish their research in the Hopkins journals as well.

The hospital's first administrator, Henry Hurd, at once saw the need for a journal to announce news of Hopkins to the medical community. In 1889 he started *The Johns Hopkins Hospital Bulletin.* Hurd's literary skills suggest a talented writer and lover of science disguised in administrator's clothes. In an 1899 article in the *Bulletin,* he writes appreciatively of the great figures like Pasteur who are able to shape theory out of an accumulated mass of findings: "The superstructure of medical knowledge has been reared slowly and almost imperceptibly by the acquisition of isolated facts which are gathered painstakingly into a confused heap by a multitude of observers ready for the hand of a master builder. . . ."

In addition to the *Bulletin,* the trustees established *The Johns*

Hopkins Hospital Reports to contain the results of the staff's scientific investigations. But its editor, William Welch, was so busy teaching and supervising research that his *Reports* were slow to reach print. So clinicians began using the *Bulletin* to publish their research.

Welch's difficulties as an editor were due mostly to his personality. Meticulous and unwilling to delegate, Welch would often write revisions and conduct literature searches himself. He checked every bibliographic reference, arranged for illustrations, laid out the issues, and proofread the copy. Welch got so far behind in producing his first bound volume that Volume II, a collection of clinical papers started much later by William Osler, actually came out in 1890, seven years before Volume I.

THE STRUCTURE OF THE HUMAN body and its organs had been known since the 17th century, and researchers were turning their attention to the causes of disease. But the main thrust of the medical research in the late 19th century was the discovery of the so-called "internal secretions of the organs." Researchers at Hopkins were, in rapid succession, bringing out the most startling news about secretions from glands and other structures in the body. These "extracts" were the things that activated development and growth in children, and regulated bodily functions such as heartbeat. Without them, severe disorders of metabolism developed.

In 1897 pharmacologists John Abel and Albert Crawford reported on their experiments to isolate a secretion they called "epinephrine" (adrenaline), which raised the heart rate in animals: "We have used sheep's gland in large quantity. The medullary substance of the fresh glands was scraped out, dried on the water-bath at 60 degrees Centigrade, ground up finely, and extracted with ether for several days. . . . [I]n a purified state, separated from all the other constituents, it might become a therapeutic agent of great importance."

Many times autopsy reports provided the most enlightening portrait of a disease. In the case of diabetes, for instance, doctors knew that people died from an excess of sugar in the blood. From a 1900 article in the *Reports* we can trace pathology instructor Eugene Opie's isolation of the then-unnamed substance responsible for metabolizing sugars.

Lynn Crawford Cook is a science writer who works for the Johns Hopkins Children's Center.



In 1900 pathology instructor Eugene Opie isolated what came to be called insulin.

Opie knew that something secreted in the pancreas "exerts some very important influence on carbohydrate metabolism." The corpse of a woman, dead at 54 from diabetes, taught him that this something was coming from a group of strangely shaped cells in the pancreas called the "islands of Langerhans."

"In an autopsy performed 51 hours after death," he writes, "it was revealed that the islands of Langerhans were the seat of a peculiar transformation. [They had degenerated into] a homogenous, hyaline [transparent, sticky] material which partly or completely replaced them.

"In the pancreas . . . described in this article, a lesion of obscure etiology has destroyed the cells of the islands of Langerhans, while those of other secreting cells, as well as those of other organs, are unaffected. The most successful experiment could not more accurately have selected these bodies. The association affords, I believe, convincing proof [that the loss of] the islands of Langerhans has been accompanied by the disease. The conclusion is justified that it is those structures which influence carbohydrate metabolism."

In 1923 Canadians Frederick Banting and J.R. Macleod would receive the Nobel prize for their first clinical application of Opie's "pancreatic extract," which they named "insulin."

TO MEET THE GROWING SUPPLY of articles, in 1896 Hopkins launched *The Journal of Experimental Medicine,* the nation's first journal devoted exclusively to preclinical research. The already overburdened Welch was chosen to edit it. He made it clear that he wanted the journal to stake out new territory, writing to his sister: "The Journal of which I am editor will be the biggest thing ever undertaken in this country in the way of a scientific medical periodical. There are to be no editorials, advertisements, or vulgar features of ordinary medical journals, but the subscribers will doubtless be as rarified as the pure atmosphere in which the journal will float."

Among the rarified papers published in the new journal was one by associate professor W.G. MacCallum, who in 1897 graduated at the head of the first Hopkins medical school class. From 1902 to 1909, MacCallum and assistant Carl Voegtlin investigated the parathyroid gland. In a 1909 article, MacCallum relates the gland to a malady of the time called "tetany," which "could be recognized by the spasmodic rigidity of the muscles, frequently with violent twitchings. . . ."

Doctors had had some success treating tetany, or epilepsy, by administering calcium. But in experiments with dogs, MacCallum was the first to find why it worked: Calcium was metabolized by secretions from the parathyroid gland.

A READING OF THE MEDICAL LITerature of the late 1800s reveals a picture (to use Hurd's metaphor) of explorers hewing their way through a forest of ignorance, with much still lying in their way. Welch protégé J. Whitridge Williams boldly states in a 1891 article in the *Reports*:

"The comparative immunity of the colored race from cancerous diseases, is well recognized by all experienced clinicians, and is a fact needing no further demonstration. Until the present case came under observation, I believed, in common with others, that the pure black enjoyed absolute immunity from the affection."

But medical knowledge is still deep in the forest where many diseases are concerned, and it is humbling to learn that researchers are still using the same descriptions of certain diseases that William Osler so eloquently put forth in his 1895 edition of *The Principles and Practice of Medicine*. Take, for instance, his description of what researchers now call sleep apnea:

"The direct effect of chronic tonsillar hypertrophy [enlargement] is the establishment of mouth-breathing. The indirect effects are . . . changes in the facial expression and sometimes marked alteration in the mental condition. At night the child's sleep is greatly disturbed; the respirations are loud and snorting and there are sometimes prolonged pauses, followed by deep, noisy inspirations."

The prescribed treatment for the affliction then, as now, was a tonsillectomy. ■

TRAVEL TO THE FRONTIERS OF YOUR MIND

Wintergreen, Virginia

Cognitive Neuroscience: The Relationships between Mind and Brain
July 23–29, 1989

The 15th annual Alumni College East takes place at Wintergreen, an outstanding resort high atop the Blue Ridge Mountains, where you can hike, ride, swim, play tennis, or tee off on two championship golf courses. The program focuses on the relationship between our mental and biological selves. "Cognitive neuroscience" is a newly emerging field that helps to provide links between specific neural processes and specific mental functions. This session provides an overview of the brain (nerve cells, anatomy, neurotransmitters, hormones), how these relate to different psychological functions (memory, mood, sexual behavior, perception, daily rhythms), and raises questions about the ways in which these links alter our thinking about the nature of human beings. The faculty includes three members of the Department of Psychology: Drs. Randy Nelson, David Olton (program chairman), and Gary Wenk. Optional afternoon programs include a visit to nearby Monticello and more. An outstanding children's program is available.
Tuition: Adults from $598 double occupancy, depending on accommodations; children ages 2–12 yrs: from $320. Includes deluxe condominiums, three dinners, three lunches, program materials, some recreation facilities, and more.

Snowmass, Colorado

Session I

Ancient Magic
July 1–8, 1989

The subject of Session I is the darker side of ancient science and religion. P. Kyle McCarter, Jr., the William F. Albright Professor of Near Eastern and Biblical Studies and associate dean of Arts and Sciences, will describe the important role of magic and the occult in the cultures of ancient Egypt, Mesopotamia, and Syria-Palestine. He will compare ancient Near Eastern methods of divination to the phenomenon of biblical prophecy and explain the relation between Israelite rituals and the cultic practices of the surrounding region. Professor of Classics Georg Luck will show that, alongside the various cults and religious doctrines of Classical paganism, there existed an occult ideology with prehistoric roots that survives in Greek and Latin literary texts and documents, such as the magical papyri.

Session II

Postmodern Culture: "Reading" and Writing
July 8–15, 1989

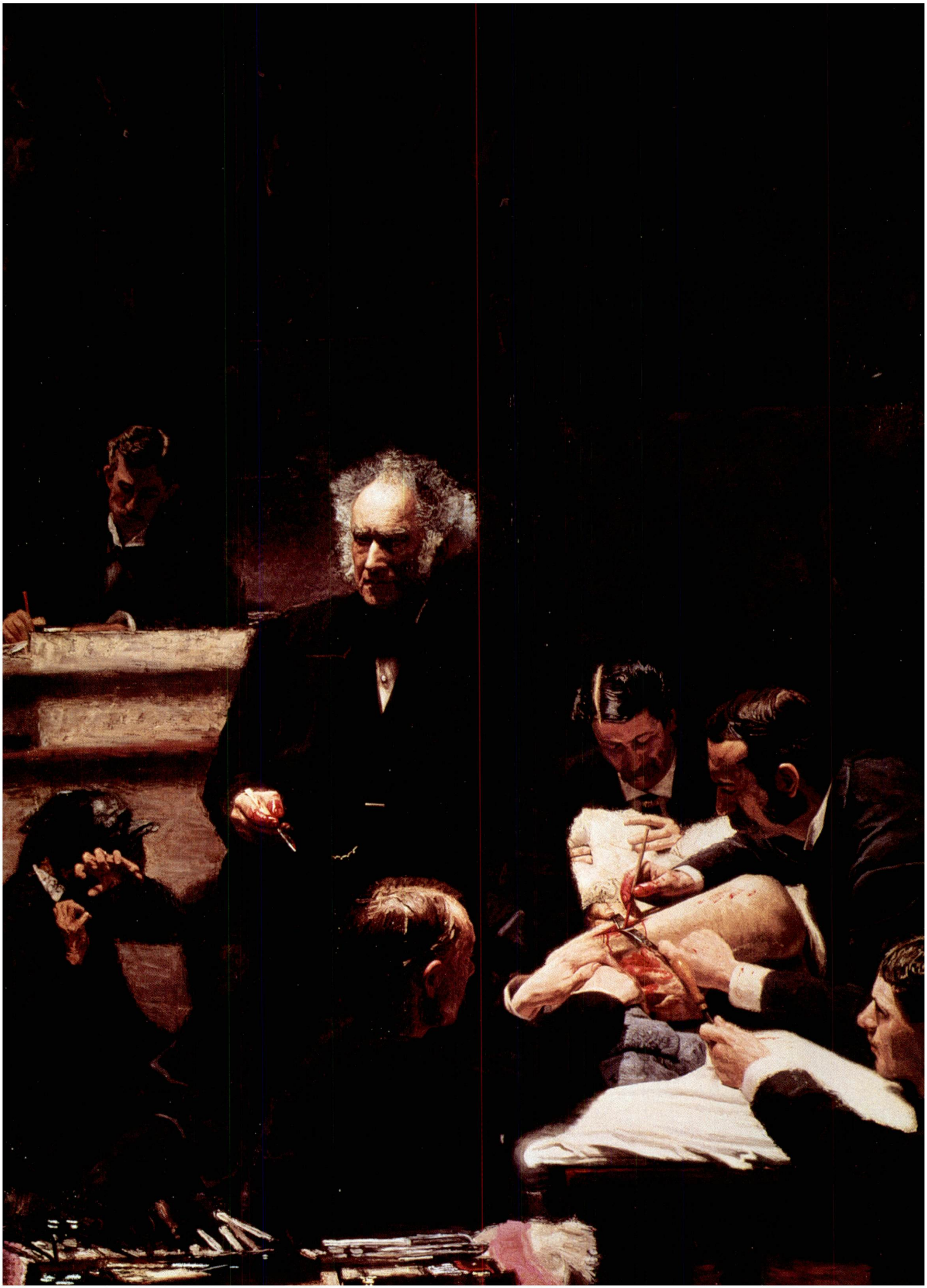
John Barth, Hopkins' renowned author, will alternate lectures and discussions on the general topic of postmodernism in contemporary fiction (with side glances at the other arts) and discuss its application to his own writing. Particular attention will be paid to his first novel *(The Floating Opera)*, latest *(The Tidewater Tales)*, and work in progress. On the other hand, Professor of Writing Seminars Mark Crispin Miller, drawing on his much-acclaimed new book, *Boxed In: The Culture of TV*, will offer a wide-ranging critical analysis of mass culture. Each lecture will include close readings of those powerful images that we tend to accept at face value. Using visual examples, he will discuss advertising, TV's campaign coverage, prime-time "entertainment," rock music, and the movies.

Each session includes Aspen Music Festival concerts, lectures, field trips, lodging, meals, optional riding, tennis, rafting, fishing, hiking, even hot air ballooning, all in the beautiful Rocky Mountain setting.
Tuition: Per person, per session $575 double occupancy. Includes lodging, all breakfasts, three dinners, field trips, concert tickets, program, and materials.

Space is limited. For further information, write to Johns Hopkins Alumni College, 3211 N. Charles Street, Baltimore, Md. 21218 (301-338-7963).



THE JOHNS HOPKINS ALUMNI COLLEGE



A Portrait of Changing Surgery

Lister's antisepsis, Gross's conservative cutting, and Halsted's combining of the two helped bring surgery into the modern era.

Thomas Eakins's "The Gross Clinic" (painted in 1875) and "The Agnew Clinic" (1889) will hang side by side in a Hopkins Centennial exhibit at Baltimore's Walters Art Gallery, June 8 through July 30. These two great works dramatically illustrate the advances in surgical practice occuring in the late 19th century.

The first (left) shows Samuel Gross, one of the country's leading men of medicine, presiding over an actual operation, a resection of the femur (thigh bone), in the surgical amphitheater of Jefferson Medical College in Philadelphia. The surgeons, dressed in street clothes, are preparing to operate with no apparent concessions to Joseph Lister's still-new idea of antiseptic surgery. The dark background and almost inhuman appearance of the exposed limb suggest the procedure's uncertain outcome.

Nonetheless, Gross's choice of a resection—a partial removal—over amputation put him clearly in the emerging "conservative" school of surgery, which valued preservation of the body over flashy surgical feats. As one contemporary remarked, "The true reputation of a surgeon is now based, not on the number of limbs amputated, but on the number saved from amputation—not on the amount of deformity created, but on that relieved. . . ."

Although Eakins was roundly criticized for his choice of such a distasteful subject, in 1889 the students of eminent surgeon D. Hayes Agnew of the Pennsylvania School of Medicine commissioned him to paint their professor at work. Again the setting is the surgical amphitheater (where at least one in the audience appears to be napping), this time at the end of a breast operation. But now the interior is brightly lit, and the patient's full form is visible. White surgical garb and drapes are in use, sure signs that by the year of Hopkins Hospital's debut, antiseptic principles were slowly gaining acceptance and surgery was moving into the modern era.



THOMAS EAKINS, *THE AGNEW CLINIC*; 1889, OIL ON CANVAS, 130 1/2" x 74 1/2". PHILADELPHIA, THE UNIVERSITY OF PENNSYLVANIA

OSLER'S SERMON AT THE BEDSIDE

By Janet Farrar Worthington

Osler preached the art of medicine, and his arduous residency training left his disciples prepared for any medical situation.

THE SURGEON FAINTED. Seconds earlier, it had been a routine procedure—removal of a fibroid tumor of the uterus—one that gynecology chief Howard Kelly had performed hundreds of times, assisted by his residents and watched from above by his students.

Everything was done but the finishing up—closing gaps in the pelvic peritoneum and making the final abdominal sutures—and Kelly, who had other patients to see, left this small job to his first assistant, William Dunn. "Dunn was a good surgeon," recounts George Corner, an intern and anesthetist for this operation, "but he had a slight mishap." Dunn's hand slipped, and his needle punctured a vein. Blood erupted into the peritoneum and, unable to go anywhere else, pooled and spread. Like a balloon, the peritoneum swelled with it. "Without warning," Corner recalls, Dunn fell forward—onto the patient.

Instantly, the operating room orderly stepped forward and dragged Dunn from the room. Assistant resident Walter Holmes, two years out of medical school and next in command, suddenly found himself in charge. Not missing a beat, he lanced the peritoneum, sopped up the excess blood, stopped the bleeding, and closed the incision.

It did not matter that Holmes had never actually performed such an operation. He had observed and assisted Kelly so often that he knew what to do. In those few minutes in 1915, Holmes also proved a point made by William Osler, Daniel Gilman, and John Shaw Billings—that the best way to learn medicine is by



watching and doing. The system of graded medical training that taught him was pioneered at Hopkins, extracted and honed by Osler from the best European models at the time. In the hospital, as in the university, somewhere between the students and faculty were graduate students—resident physicians, or "house officers," who studied, ate, and slept on the premises, minutes away from their patients.

Like so many Hopkins innovations in medical training, this one stemmed from the founder's simple provision that the teaching of medicine and the care of patients be combined. The same person, for example, was put in charge of a department such as pathology in both the hospital and the medical school. Among other things, this guaranteed that Hopkins would be on all levels a teaching hospital; medical students and house officers would learn not simply how to practice, but to study—and, in turn, teach—medicine.

WHEN THE HOSPITAL OPENED, THIS freedom to learn gradually—in measured doses of responsibility—did not exist for medical school graduates in the United States. Students seldom had the opportunity to participate in patient care. There *were* house officers at other hospitals in 19th century America, and the demand for round-the-clock patient care skyrocketed as technology (particularly the availability of electric light) advanced. But the system in the 1880s was hardly conducive to patient recovery. There were no standards to force attending physicians, whose income depended on seeing private patients, to keep regular hospital hours, or even to show up every day. Staffing most hospitals, then, were doctors fresh out of medical school—many who had never prescribed for patients, much less been given near autonomy over them.

The situation for hands-on training in the laboratories and on the wards was better in Europe, for a fortunate few. In France, a competitive examination ruled out all but the elite for coveted residency slots. In British teaching hospitals, medical students were allowed on the wards, but few were permitted an actual clinical clerkship—and direct, daily contact with patients. Similarly, for medical students below the top of their class in laboratory-oriented medical schools in Germany, research opportunities were out of the question.

Osler, modeling the Hopkins residency and clinical clerkship around the best of the European systems, reduced the elitism. *All* medical students and house officers (who by being at Hopkins were already an academically elite group) became involved in day-to-day patient care. As Osler put it, they were "part of the machinery of the hospital." Learning by doing in the hospital, argued Osler, was a student's "right, not . . . a privilege grudgingly granted by the trustees." He believed that "in the natural method of teaching the student begins with the patient, continues with the patient, and ends his studies with the patient, using books and lectures as tools, as means to an end."

Born and educated in Canada, Osler had been physician to the Montreal General Hospital and professor of medicine at the University of Pennsylvania. Already established as a first-rate teacher and diagnostician, Osler came to Hopkins at age 44 with modern ideas on teaching clinical skills.

Osler's system of intensive residency training was pyramidal: Lowest on the slope were interns, the top unmarried medical school graduates, appointed for a one-year term. Above them were several assistant residents; chosen from among the previous interns and imported from other teaching hospitals (to avoid inbreeding), these young doctors desired more extensive training. At the top was one resident physician ("the resident"), second in command to the head of the department.

Each service—medicine, surgery, and gynecology—had its own resident and assistant residents and, after 1900, its own set of interns. The first crop of 12 interns, chosen from the School of Medicine's first graduating class in 1897, "rotated," spending several months on each service. (In today's age of specialization, interns rotate only among various specialties within their discipline.)

For assistant residents and residents, the length of stay was indefinite. This could mean one year or several—however long it took to complete specialized training. (William Thayer, for example, was the resident in medicine from 1891 to 1898. Hunter Robb, the first resident gynecologist, held that job for three years. And Frederick Brockway, the first resident surgeon, left Hopkins after a year and a half to teach anatomy at the College of Physicians and Surgeons in New York.

During that time, as house officers carried on the daily workings of the wards, laboratories, and outpatient department, they gained experience in caring for patients and teaching third- and fourth-year medical students. They also freed the chief clinicians for other work, and ensured a form of quality control for patients. "What

Osler approached his calling with an almost religious zeal. To him, the patient was not a text suggesting a sermon. The patient was *the sermon.*

100 YEARS LATER

RESIDENTS STILL GET LITTLE REST

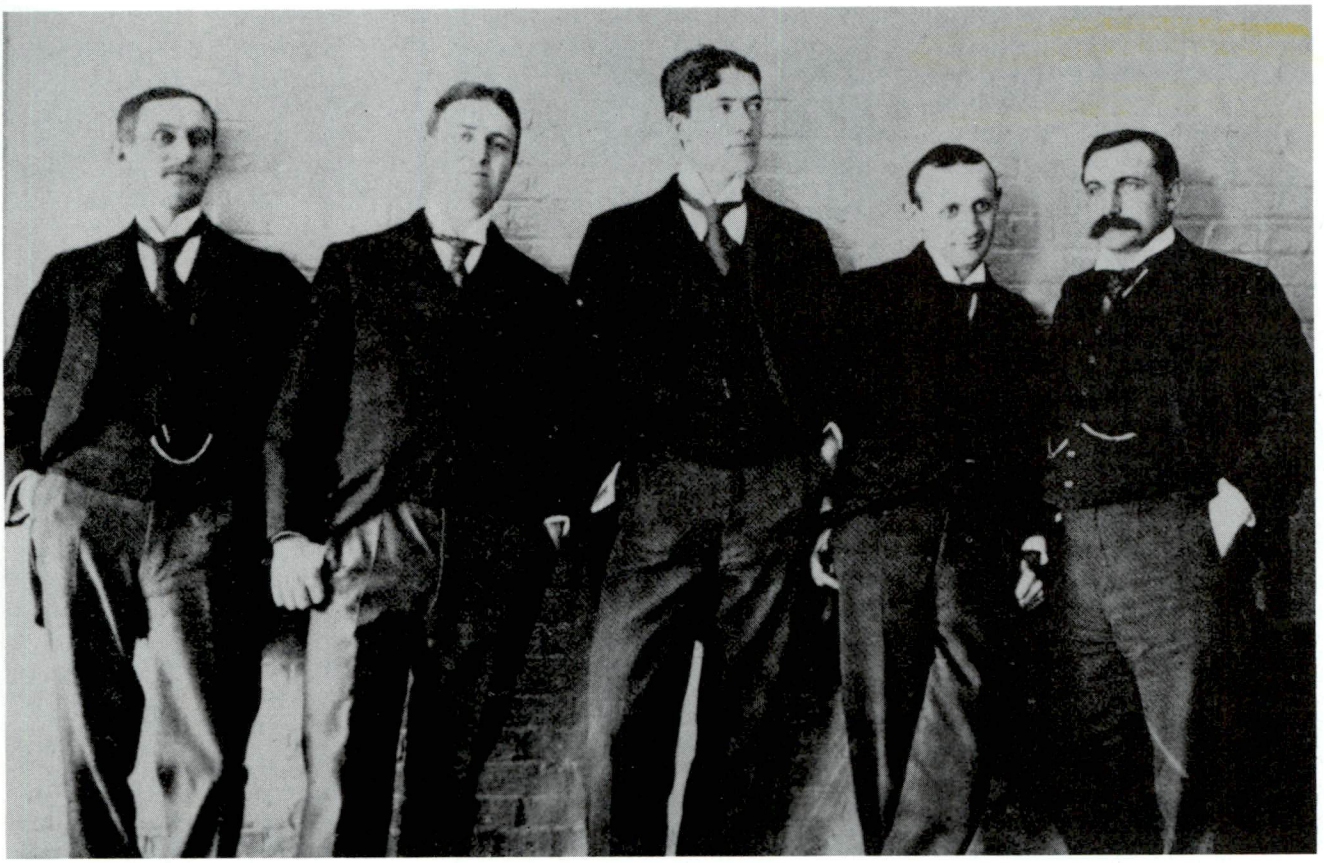
House officers now are able to come up for air, at least. They no longer live in the hospital, they have more free time and are allowed to be married. They receive salaries and benefits (and don't need to sell their blood to make ends meet).

Because of restrictions on medical insurance, their patients are sicker when they come in—and leave—the hospital than in Osler's day. Average patient stays are shorter; turnover is high.

Rounds are basically the same as when Osler led them. Hours, for the most part, are more humane. Except for "on-call" days (which may mean a grueling, 36-hour stretch without sleep), most weekdays are reasonable—about nine or 10 hours long. Weekend hours are often shorter. (Thanks to the invention of the beeper, some residents can even be on-call—and dispense instructions to the intern on duty—over the phone.)

Every service has designated "call" days for house officers, when it's their job to handle any new admissions, maybe as many as six or seven in one day and night, and tend the patients on their ward (from 20 to 40 beds) when the other doctors go home. The call schedule ranges from the exhausting every-other-night (common in surgical and intensive care services) to the more manageable every-fourth-night.

The residency is still a trial by fire offering a wealth of clinical experience.



Early residents and fellows, from left: Franklin Mall, William Thayer, Lewellys Barker, Simon Flexner, and Frank Smith. Hours were grueling, and clinical experience was unparalleled.

patients lost in privacy they gained in the quality of care, as they were observed by a hierarchy of physicians rather than by a single physician," explains A. McGehee Harvey, Hopkins director emeritus of medicine. Because the system necessitated that some interns and assistant residents leave Hopkins each year, the Hopkins plan of medical practice spread to other hospitals and eventually—with the help of Simon Flexner's 1910 report on medical education—became the standard.

The clinical clerkship, inaugurated in 1895, in effect taught senior medical students how to be house officers. As preparation for the wards, Osler drilled students on the basics of day-to-day patient care: how to take a patient's history, make a step-by-step clinical diagnosis, how to take a detailed physical examination. He installed a diagnostic laboratory in the hospital—another first—and taught students practical applications of the chemistry, physics, and biology they had learned during their first two years (how to examine blood and other body fluids, for example.) The clerkship taught one student, G. Canby Robinson, the value of "persistent diligence."

"A young girl was thought to have pulmonary tuberculosis," Robinson recalled, "but the tubercle bacilli had not been found in her sputum. It was put up to me to verify the diagnosis." For days, he collected the girl's sputum, prepared slides, and spent hours hunched over the microscope. It took him three tedious weeks to confirm the diagnosis, but Robinson cherished the memory as "an example of the freedom and responsibility we were given in our work with patients."

EVERY MORNING AT 9, OSLER WENT on ward "rounds," trailed by a flock of house officers and senior medical students. At each bedside, one acolyte would "present" the patient—giving a concise account of family and personal health history, the results of any tests, and all pertinent signs and symptoms.

On such occasions, Osler "acted as a fellow student with us, guiding us in our examinations of the patient, causing us to see what we had not previously noted," as one student recalled. The son of a minister, Osler approached his calling with an almost religious zeal. "In teaching, he seldom used the lecture method," a student remembered. "The patient was not a text suggesting a sermon; the patient *was* the sermon."

Beginning with the specific aspects of one patient's disease, Osler would lead into a discussion of its broader lessons, especially if it were as many-faced as tuberculosis or syphillis. "Know syphillis in all its manifestations and relations," Osler once said, "and all other things clinical will be known to you." (Signs of syphillis can be seen, heard, or felt in the eye, heart, hand—or any bodily tissue, including the brain and spinal column. In learning to distinguish between syphillis and the diseases that mimic it, a student covers a vast spectrum of medicine.)

Osler preached the art of medicine, and bade his disciples to take notes. "Given the sacred hunger and proper preliminary training," he wrote, "the student-practitioner requires at least three things with which to stimulate and maintain his education, a notebook, a library, and a quinquennial brain-dusting. I wish I had time to speak of the value of notetaking. You can do nothing as a student in practice without it. Carry a small notebook which will fit into your waistcoat pocket, and never ask a new patient a question without notebook and pencil in hand." (Osler's advice was not always so serious, but often was invaluable: "Look wise, say nothing, and grunt"

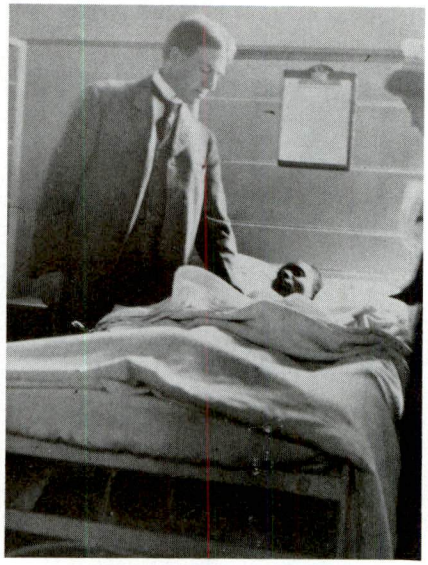
was among his more popular suggestions. He also dispensed doses of homespun wisdom, such as "common sense in matters medical is rare, and usually in inverse ratio to the degree of education.")

Osler's residency system, adapted by Howard Kelly for gynecology and William Halsted for surgery, remained virtually unchanged well into this century. Mark Ravitch, who trained in the 1930s, remembered the strictness of the graded responsibility in surgery. "We knew at each level what decisions we could make alone and which required confirmation or sanction," he said. "Elevation to the status of 'the operator' was long delayed. I had been in a white suit seven years before I performed my first appendectomy and eight years before I performed my first cholecystectomy.

"We had assisted the Resident and the visiting staff so many, many times at operation after operation, that by the time we undertook the procedures on our own, it hardly seemed as if, in fact, we were so doing for the first time." True, he pointed out, "people can be taught to operate skillfully in less time than that. We accepted the fact that we were expected to emerge as polished surgeons, prided ourselves on that, but took it for granted. The big point was that we would be mature, knowledgeable, experienced, and canny clinicians as well, and have a grounding in our profession that would permit us to grow in almost any direction."

HOPKINS MEDICAL TRAINING DEmanded—and received—total commitment from house officers. Students and residents lived either in the hospital or five minutes away from it. Hours were grueling, and pay was minimal. In the 1920s, for example, interns received nothing but room and board and the white "Good Humor" uniforms (still worn by Hopkins house officers). Assistant residents were paid $20 a month, residents $1,000 a year. For years, marriage (and, for a highly controversial period, smoking) was prohibited. That Mark Ravitch had married secretly was discovered in late one night, as both he and his bride fled his apartment during a midnight fire. A crowd of Hopkins onlookers burst into applause.

Yet despite the hardships, or because of them, training at Hopkins in those days has been remembered for friendships forged over long hours on duty, over meals—all taken together in the Doctor's Dining Room—and for what Osler called the "spirit of the place," an atmosphere characterized by "comradeship, sympathy one with another, devotion to work."



William Thayer polished his clinical skills as "the resident" from 1891 to 1892, and emerged a master diagnostician.

The reward for such monastic dedication to study and for "obsessive attention to clinical care" in those early years was a medical education unparalleled in this country, reflected Ravitch, who said he made more money in his nine years as a house officer by selling his blood (for $35 to a ward patient or semiprivate patient, $50 to a private patient) than from his salary.

But the clinical experience was worth the high price, Ravitch added. "It was wrong and immoral for us to be penniless and have to depend on parents or a wife or blood transfusion money to buy cigarettes or whatever. On the other hand, the only hospitals that paid anything were those that essentially bought their interns with a stipend. The quality of residency training was in inverse proportion to the amount you got paid."

A house officer worked days, nights, and weekends. His only respite was a month's vacation, and to take it (or to get away even for a few hours), he had to find a student or house officer willing to fill in. When he returned to the hospital, he went straight to the ward to make certain his patients had been properly cared for. "We lived with our patients and knew them," said Ravitch. In return, "we had a degree of clinical exposure and maturity, and a scientific background, as well as appreciation of the cultural aspects of medicine and a consideration for patients and their humanity, all to an extent not common elsewhere, and perhaps exceptional to this day." ■

ON YOUR OWN IN THE O.R.

The original chiefs of service had tremendous faith in their residency training system, as George Corner shows in the following anecdote from his autobiography:

One morning in the spring of 1915, Dr. Kelly had finished his own operations and had gone to visit the convalescents while the resident's team operated on a woman from a public ward. In spite of his skill, Neel [the resident in charge of the operating room] found himself in trouble. The patient's internal condition was much worse than expected. . . . Two hours went by, and the patient began to weaken. The anesthetist—that was my part in the team—found it necessary to warn Dr. Neel to hurry, but Neel could not hurry. The pulse became so weak and rapid that I could not count it. . . . We all worked on in grim silence broken only by Neel's worried inquiries to me about the patient's condition and my doubtful replies. The students were getting restless in the stands. In short, we were almost dangerously rattled, when the door opened and in came Dr. Kelly.

"How are you getting on?" he asked. "Badly," said Neel. "I'm afraid we're going to lose her; wouldn't you like to scrub up and help me?"—a suggestion that would have cost a precious 10 minutes at least. By this time, Dr. Kelly was behind Neel looking over his shoulder. "Oh no," he said. "You are doing an excellent piece of work. I can't add anything. You have a hard job there, Doctor, but that's the way I'd do it myself."

He came to the head of the table and asked me about the pulse. "One hundred and eighty," I said, "the last time I could count it." "Yes," said Dr. Kelly, taking the pulse himself, "I can barely feel it. I see you're doing all the right things," and then to the students, "The doctor is giving a very nice anesthesia; you'd do well to study the chart afterward." I don't remember that he said anything more. He remained a quarter of an hour calmly watching us work and then paid Neel the best compliment of all; he went out of the operating room and disappeared, leaving behind him five young men who felt as if they had been knighted on the field of battle. If we were to lose our patient on the table, the chief was witness that we had made a valiant fight. But we did not lose her, and a month later she was well.

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THE ART OF MEDICINE

ANATOMY OF A MEDICAL DRAWING

Dissect, comprehend, and then illustrate, taught master Max Broedel

The mere copying of a medical object is really not medical illustrating at all," said Max Broedel. "It goes much deeper than that."

Good medical illustration, said Broedel, known as the father of the discipline, begins with a thorough, detailed understanding of anatomy, pathology, physiology, and histology. It takes a medical operation or condition and condenses, analyzes, interprets, and teaches.

Medical illustration had no such definition—nor even any standards—when Broedel, a meticulous draftsman and lithographer trained in Leipzig, came to America in 1894. The situation, he recalled, was dismal. The self-taught artists, he said, "knew little about medicine and less about art." Worse, they plagiarized each other's work—often perpetuating serious mistakes.

Broedel, trained in fine arts in the 1880s, never set out to be a medical artist. But he needed money, and took on extra illustrating jobs in his free time. One such job, at the Leipzig Physiological Institute, was to illustrate the research of physiologist Carl Ludwig and some of his pupils—including Franklin Mall and William Welch. On Mall's recommendation, Howard Kelly brought Broedel to Baltimore to illustrate his textbook *Operative Gynecology.*

Broedel found himself unprepared for the job. He had learned a little about anatomy from Ludwig, but "I did not know then that the only way to plan a picture is to leave paper and pencil alone until the mind has grasped the meaning of the object. I blundered when I relied on faithful copying alone," he said.

Broedel repeatedly dissected and studied the regions he was asked to draw. He realized—and taught his students—that there is no substitute for personal observation. "I found also that preliminary dissection means greater speed in drawing, bolder and more artistic results," he said.

Broedel enjoyed the luxury of making his own studies. Once, recalled his friend gynecologist Thomas Cullen, Kelly wanted some anatomical data about the blood supply of the kidney. Broedel spent hours studying the problem. He brought kidneys back from autopsies and dyed the arteries red, veins blue, and the ureter yellow. Then, with a method learned from Mall, he used chemicals to "digest" each kidney. "Various portions of the kidney reminded one of branches of an apple tree," recalled Cullen, "and all over these branches were minute apples—they were the glomeruli or filters of the kidney. He pointed out the avascular area . . . and suggested opening the kidney along this line when exploring for [a kidney] stone."

In this investigation Broedel developed a triangular suture for use on a prolapsed kidney. The suture became known as "Broedel's suture," and worked so well, said Cullen, "that a piece of kidney will tear out before the suture will give way."

Broedel also experimented with his art. Realizing that "a swifter technique always means a more artistic picture," he worked to improve the speed and quality of his illustrations. He developed a means of producing fine halftone drawings in carbon dust on a calcium-coated paper, creating highlights (indicating glistening, fresh tissue) with erasers and a metal scraper. The method still bears his name.

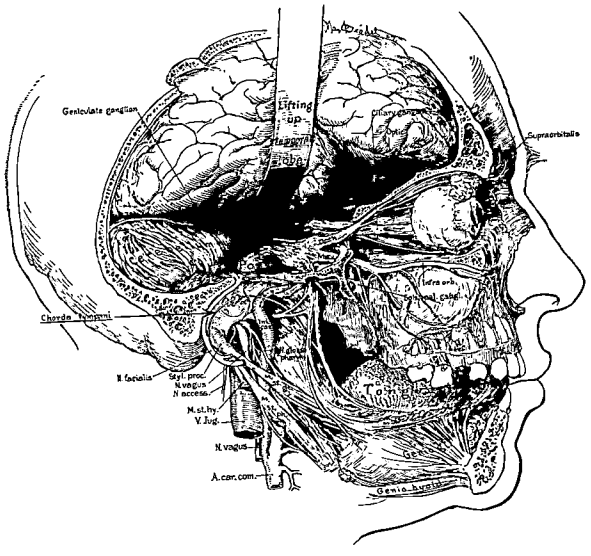
The excellence of Broedel's work led to the establishment in 1911 of a Department of Art as Applied to Medicine—the first of its kind in this country—through the efforts of Cullen and Baltimore philanthropist Henry Walters.

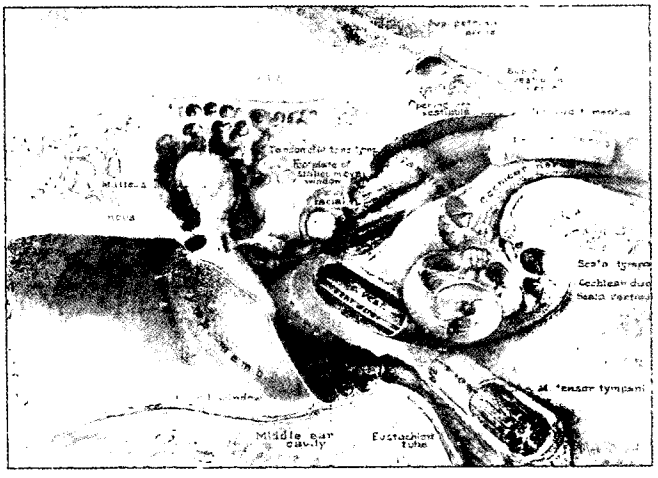


COURTESY OF ART AS APPLIED TO MEDICINE (ALL)

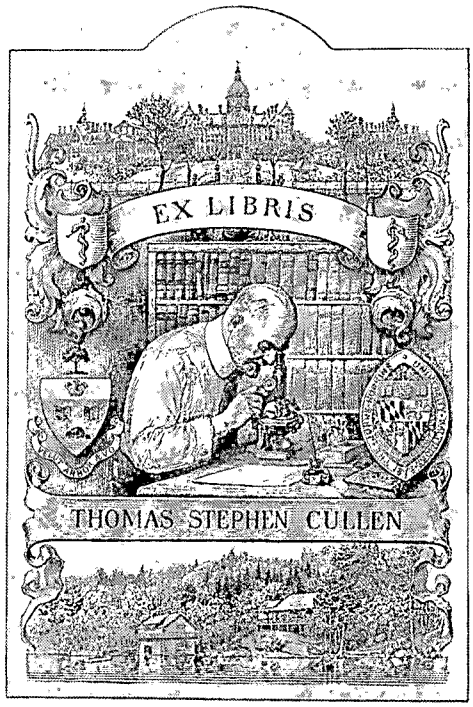
"The medical artist should never try to replace the camera," said Broedel (in his studio, above). "A photograph . . . gives no answer to the host of inquiries which plague the student. It makes a dramatic picture, not a scientific one." The cross-section of the head at right is a roadmap for anatomy students; Broedel lifted the temporal lobe to show what lies beneath. In the halftone drawing of the ear (far right), Broedel not only details the topography, but explains how it works.


TODAY
14

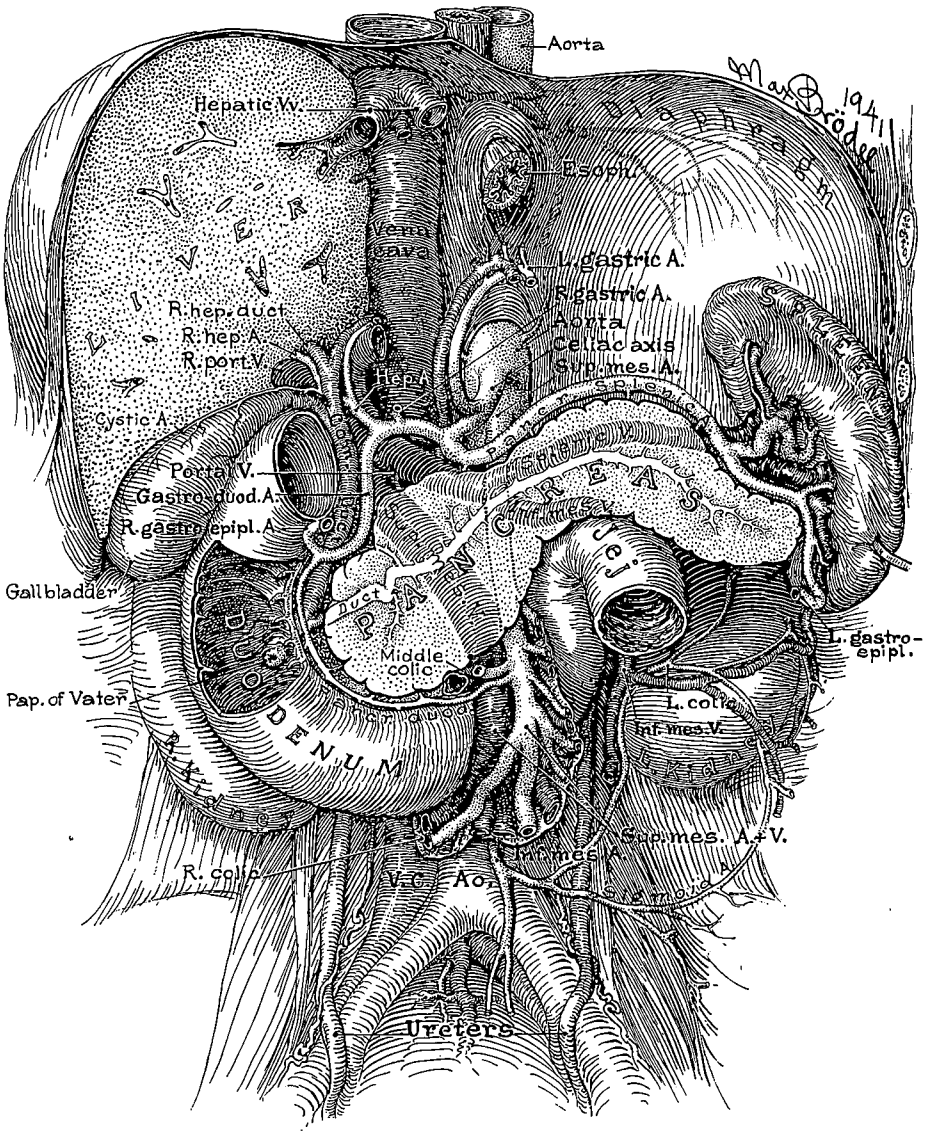

Geniculate ganglion
Lifting up
Supraorbitalis
Chorda tympani
N. facialis
Styl. proc.
N. vagus
N. accesso.
M. st.hy.
V. Jug.
N. vagus
A. car. com.
Genio hyoideus


Middle ear cavity
Eustachian tube
M. tensor tympani





Seams on the rubber gloves date the drawing at far left—done from a brain surgeon's perspective—from the turn of the century. So vivid was Broedel's work that a Hopkins nurse once tried to pick off a gallstone that she thought had been glued to one of his pictures. He demonstrated his master draftsmanship in this bookplate, designed for Thomas Cullen.



This drawing of the abdomen, showing Broedel's skill as a lithographer, was one of his last. Some speculate that he may have been diagnosing his own fatal illness, pancreatic cancer. He died in 1941.

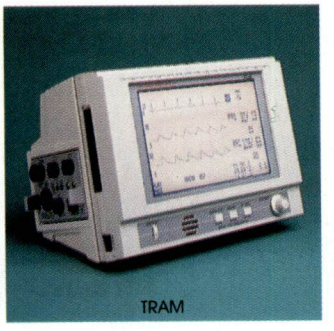


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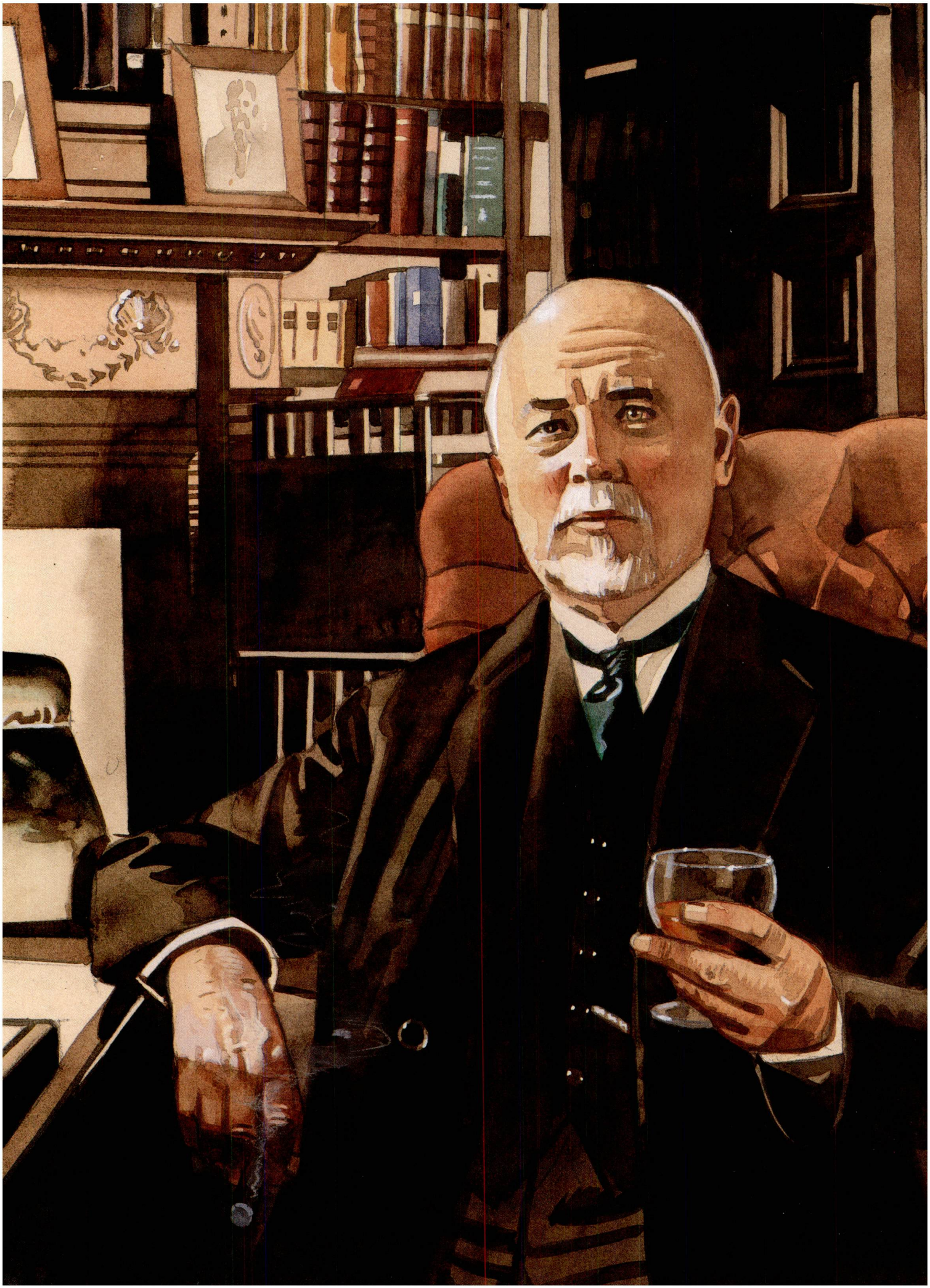
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THE POLITICS OF PREVENTION

By Lavinia Edmunds

Through lecturing, lobbying, and personal charm, William Welch persuaded the rich and powerful to improve public health.

WILLIAM WELCH, the short, rotund doctor who had hoped to spend his life finding cures in the laboratory, found himself on this evening lecturing on sewers. It was November 19, 1897, and he was addressing Maryland's most distinguished doctors and public health workers on "The Relation of Sewage Disposal to Public Health."

Welch usually spent his evenings dining at the University Club. About this time he would have adjourned from a good meal for one of his notoriously bad cigars. But as his days were occupied by his pathology laboratory, his evenings were increasingly devoted to civic obligations, stemming from his dedication to a new concept in medicine—public health.

Welch was out to convert Baltimore and the country to his broadening vision of medicine. It wasn't enough to know how disease spread, or how to cure it. The goal of public health—to prevent disease from occurring in the first place—catapulted Welch into many seemingly unrelated causes, from sewers to housing to mental health.

Public health would demand all the laboratory skills Welch had learned in Germany to identify the agents of disease. But it also would call on the hard data of a new field, epidemiology, to persuade the powers-that-be to adopt preventive strategies. Eventually, the Welch vision would crystallize in the Hopkins School of Hygiene and Public Health.

The point about sewers was that Baltimore had none. Instead it had cholera and typhoid. "The conditions here in Baltimore, with its leaky and overflowing surface drains, with

its utterly insufficient storm water drains, with one-twentieth of its area, exclusive of streets and parks, occupied by privy pits and cesspools, permitting often overflow and leakage into the ground and cellars, with arrangements by which sewage and garbage are allowed to befoul the streams and the harbor basin, are obnoxious in the extreme," Welch told his audience that night.

He pointed to a chart he had brought. The first column showed the average number of deaths from typhoid fever in 313 cities without sewers; the second column, the deaths in 39 cities with sewers, "less than a quarter of the first in height," Welch said. He had some convincing statistics: a death rate from typhoid of 24.2 per 10,000 inhabitants when they drank from wells and excreta were stored in privy vaults, compared with 1.4 in cities with sewers.

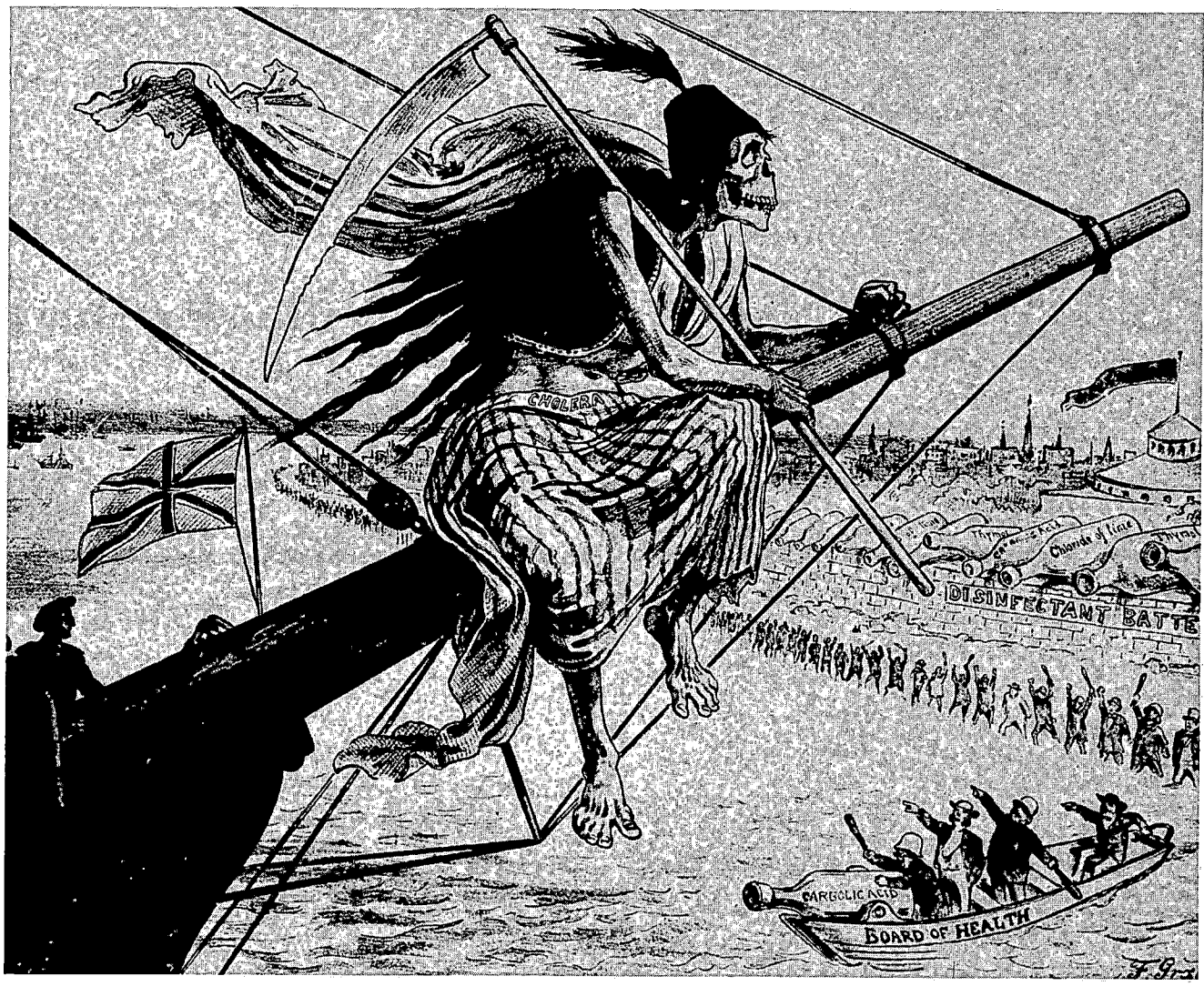
Welch knew how fickle and how crucial

Welch's thinking never ended in thinking, as with so many of us, but in action. He turned his knowledge of pathology and bacteriology to the public good.

public opinion was. It had taken the cholera threat of 1892 in New York to persuade its population that public health measures could save lives. Welch had seen the sunken faces, the bluish-white hands and feet, as the body emptied itself of water, the convulsions and death. There was no doubt that cholera was carried by water contaminated with sewage. Quarantine, the chief method of controlling disease at the time, was not enough. Working with other bacteriologists, Welch had helped to establish the first municipal bacteriological laboratory. The disease was stopped at the port of New York. Only 100 died.

The Baltimore battle of the sewers, however, was not to be won until 1909. Politicians professed to be looking for "cholera-proof" answers, but they were often swayed by other considerations. Baltimore was hamstrung by the misnamed Odorless Evacuation Association, the group of waste col-

When cholera threatened New York in 1892, Welch helped establish the first municipal bacteriological laboratory. As this illustration of the time suggests, the disease was stopped at the port of New York.



THE BETTMAN ARCHIVE

lectors known as "night soil men" who collected the waste at night and carted it away to dumps. Sewers would put these men out of business, and they lobbied with all their might. Only in 1909 would they finally lose the fight, in no small part because of more than 20 years of sewer promotion by William Welch in speeches, interviews with local newspapers, and lobbying of the City Council.

For Welch, the battleground for fighting disease had expanded naturally from the laboratory, where he had begun his career, to the community. "There are no social, no industrial, no economic problems which are not related to problems of health," he said in another speech. "The better conditions of living, housing, working conditions in factories, pure food, a better supply of drinking water, all these great questions, social, industrial, and economic, are bound up with the problems of public health."

In an era when many still accepted illness as fate, Welch was keenly aware of the power of science to reveal the origin of many diseases and thus point the way to their prevention. Yet he also realized that only men of public influence—not lab scientists—could bring public health out of the dark ages.

"Welch's thinking never ended in thinking, as with so many of us, but in action," said Martin Fischer, a physiologist from the University of Cincinnati who was a contemporary of Welch's. "He turned his knowledge of pathology and bacteriology to the public good."

IN 1876 YOUNG WILLIAM WELCH sailed to Germany to study with the men who were blazing trails in bacteriology and pathology. He sat in the laboratory in Breslau when Robert Koch demonstrated how a specific bacteria caused anthrax. Koch and his students went on to identify other bacteria as the causes of the century's most dread diseases—Asiatic cholera, diphtheria, typhoid fever, and tetanus, to name a few.

Returning to the United States, Welch decided he would spend his life in the laboratory identifying the agents of disease. At New York's Bellevue Hospital Medical College, he set up a lab in three makeshift rooms, which he equipped for $25 with six kitchen tables (not counting the old microscopes). But it was at Hopkins that he created the first full-fledged pathology laboratory in the United States, with the most modern equipment and a crew of dedicated graduate students.

From the beginning, though, Welch recognized the public implications of his lab work. He had seen at the Munich hygienic insitute of Max Von Pettenkofer "how methods of sanitary reform and purification of soil and water had almost abolished typhoid fever," write Welch biographers Simon and James Flexner. Bacteriology, Welch said, "transformed public health from a blundering set of doctrines and practice to a science and laid secure foundations for its further development." From the time of his arrival in Baltimore in 1885, his dream had been to establish a divison of public health in the medical school.



COURTESY OF THE ROCKEFELLER ARCHIVE CENTER

Typhoid vaccine was administered in an early Rockefeller Foundation public health project.

Meanwhile, students who trained in his laboratory would go on to controlling disease in the field. Walter Reed got his first look at filterable viruses in Welch's laboratory. Reed and his associate James Carroll, another Welch student, later would identify filterable viruses as being responsible for yellow fever—the first time such an organism was shown to cause a specific human disease. Jesse Lazear, who taught clinical microscopy at Hopkins from 1895 to 1900, would be killed a yellow fever-carrying mosquito while proving that the insects carried the virus.

Yellow fever was also drawing Welch away from the lab as his reputation in practical health matters spread. At the turn of the century, when yellow fever and malaria among workers were hindering construction of the Panama Canal, President Roosevelt praised Welch's incisive, forthright advice. Welch headed a delegation that selected William Gorgas as chief sanitary officer; Gorgas was able to eliminate yellow fever in Panama.

As the most popular man on the medical speaking circuit, Welch was a tireless promoter of improved sanitary, housing, and other social conditions. Honors and obligations seemed to fall into his lap, despite his protest to his nephew that such engagements were "interfering in my teaching and laboratory work, which are my real interest." Elected president of the American Medical Association, he said, "I was not desirous of the presidency but there was no escape without giving offense."

Welch had become politically adept, but he would continue to say he had become involved so as to keep politics out of the campaign for improved health. After serving as president of the Maryland Board of Health in 1898, Welch wrote, "My main use on the Board is to prevent interference . . . and to keep politics out."

For one so disdainful of politics, Welch was very good at the game, aware of the importance of personal contacts. In 1896

100 YEARS LATER

SOME MDs CHOOSE PUBLIC HEALTH

Public health still does not attract droves of physicians to its ranks, but the School of Public Health does claim one of the largest residency programs in preventive medicine in the country.

The complaint of Mark Parkinson, chief resident in the Preventive Medicine Residency, echoes that of William Welch. "Our health system is oriented toward curative care," Parkinson says. "There's lack of exposure to the subspecialty and lack of funding for the residency."

Since beginning in 1963, the program has graduated 300 physicians. Most join public health departments at the state or federal level. The problem with government jobs, as Welch knew well, is that many appointments are political. The average tenure of the head of a state health board is three years, says Parkinson. And salaries in the field are low by medical standards, averaging $80,000.

Karen Johnson, who enrolled in the program after her residency in internal medicine at the University of Tennessee, plans a career teaching physicians to incorporate preventive medicine concepts in their practices. "Some of my friends don't understand it. In internal medicine, the emphasis is on curing disease. You can put your finger in the dike, but there is still a hole. My feeling is I can prevent the hole from ever occurring."

he organized an astonishingly effective campaign against an antivivisectionist measure pending in Congress, which he believed would cripple scientific investigation. In one night, Welch wrote a resolution of opposition that was adopted by the Association of American Physicians. Then he corralled his colleague William Osler into spending an evening persuading a senator from Colorado to take on the battle. The next winter he devoted to lobbying: He wrote pamphlets for national journals and magazines, contacted famous people to endorse his positions, and organized all the organizations he could think of. Then he paid personal calls to every senator on Capitol Hill, refusing to leave their offices until they signed a card indicating a yes or no vote. Only when Welch had a majority of "yes" cards in his pocket did he relent.

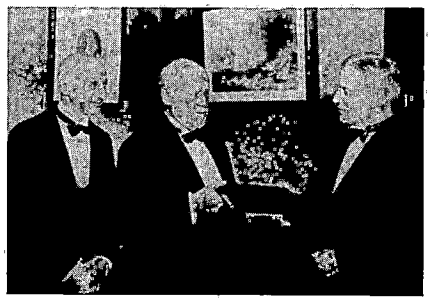
Part of Welch's success lay in his ability to speak extemporaneously, entertaining as he informed. He had always "known how to say the right things in the right way with a perfection and completeness that is without parallel in my experience," said William Howell, a professor of physiology who became director of the School of Hygiene and Public Health in 1926.

He was well-versed on a surprising range of topics, from the Baltimore Orioles to poetry, but his apparent spontaneity was actually carefully planned. He would prepare for his frequent dinner parties in the University Club library, where members blamed him for wearing out the *Encyclopedia Britannica*. While visiting Norway, he was to dine with the Norwegian premier. He excused himself for the afternoon, in the course of wich his friends found him in the National Gallery of Art taking copious notes. That night at dinner, when the conversation turned to Norwegian art, Welch delighted the premier with his newfound expertise.

Little could shake his composure, even the apparent chaos of his life. The suits he wore to his Wednesday lectures were sometimes littered with his cigar ashes. In his right vest pocket, Welch often kept friction matches loose. One day in class, Welch leaned forward dramatically to make a point; the matches rubbed against his stomach and ignited. Welch calmly extinguished the fire and dropped the matches in a drawer. He went on with the lecture thinking no one had noticed the incident, but a week later his students presented him with an inscribed gold matchbox.

He was not known as a good administrator; the sight of his office and home, where papers were piled high on chairs and tables,

John D. Rockefeller was so impressed that an adviser of his told Welch in 1903, "There is practically a blank check for you . . ."



COURTESY OF THE ROCKEFELLER ARCHIVE CENTER

At 80, Welch was flanked by two of his greatest supporters, Simon Flexner (left) and John D. Rockefeller Jr.

amazed visitors. "On that armchair, I have the letters that have come during the last week; I hope to read those in the near future," he told one visitor. "On that chair, I have the letters that have come within the past month."

But he was able to keep a clear view, answering his most important mail and rarely missing appointments. "Personally I never gave him credit for forgetting anything," wrote his student Allen Freeman, who later became a professor and dean at the public health school. "If he forgot something, I assumed that he did not want to remember. . . . When he was working something out, he was absolutely tireless. He would personally call on everyone concerned, write exhaustive memoranda . . . when it became settled, he would fall back into his usual routine."

AS WELCH CHAMPIONED PUBLIC health, philanthropists of the day began to take interest in the field, and to seek such visionaries to direct them. Welch, as a director of the Carnegie Institution and the Rockefeller Institute, was happy to supply ideas and more arguments for involvement. "Merely from a mercenary and commercial point of view it is for the interest of the community to take care of the health of the poor," he said in his speech to Maryland health workers on sanitary reform in 1890. "Philanthropy assumes a totally different aspect in the eyes of the world when it is able to demonstrate that it pays to keep people healthy."

Pointing out the economic benefits from scientific medicine helped make Welch a fundraiser of legend for Hopkins, even though he professed dislike for the task. He once grumbled when he had to cancel a lecture for a New York meeting with J. Pierpont Morgan to discuss funding the Wilmer Eye Institute. Morgan began by remarking that he had already contributed. "Yes," Welch replied, "but I should like to explain to you quite fully what is in our minds." After the Welch explanation, Morgan upped his contribution to $250,000.

Early in the spring of 1901, John D. Rockefeller sought out Welch for help in establishing an independent organization for medical research, similar to the Pasteur Institute in Paris. Named board president of the Institute for Medical Research, Welch "assumed almost all the details of getting that institution started . . . every detail was attended to with his own hand, every letter handwritten," the Flexners report. Rockefeller was so impressed that an adviser of his told Welch in 1903, "There is practically a 'blank check' for you to be filled in as desired."

Welch reaped the rewards of the new philanthropic organizations, which were just beginning to distribute large sums of money. Having fans in the Flexner family helped. *(See box, page 93.)* One former devoted student of his, Simon Flexner, became director of the Rockefeller Institute for Medical Research, while Simon's older brother, Abraham, was author of the influential 1910 report that lauded Hopkins as a model for medical education. So when Abraham Flexner was chosen to head up the search for a site for a new school of public health, to be generously funded by the Rockefeller Foundation, Welch had more than an edge in the competition.

The foundation was a relative newcomer to public health, having been drawn into the field by its campaign for the cure and prevention of hookworm, headed by Wickliffe Rose in the South. Beginning in 1909,

the five-year campaign reduced the incidence of hookworm as well as other diseases spread through soil contamination, such as typhoid and dysentery. But Rose found a dearth of competent public health officials to follow through on the preventive measures. Public health officers were often political appointees or served only part-time. Physicians were too busy with private practice.

At the Rockefeller General Education Board conference meeting to discuss the founding of a public health school in 1914, Welch skillfully maneuvered the proceedings so that he was named, along with Rose, to write a plan for the new school. With typical procrastination, Welch put off his report until the day before it was due, yet to this day the ideas it contains are the model for American schools of public health. His plan included a school with a strong research base, associated with a university, but with its own faculty, administration, and laboratories.

Welch's first coup was that his ideas were accepted by the committee. The second was that the young Johns Hopkins University was selected as the location—winning out over Harvard, Columbia, and the University of Pennsylvania. Flexner later would explain his preference for Hopkins—and for Welch: "Returning to New York, I reported that the place was of secondary importance, the man of primary importance." Flexner admired Welch for "his breadth of vision and wisdom, his judicious appreciation of what was excellent in Germany, his wide historical knowledge, and his wonderful sense of just what was necessary in order to adapt foreign experience in medical teaching to American conditions."

As Elizabeth Fee, associate professor in health policy at the School of Hygiene and Public Health, relates in *Disease and Discovery*, her history of the school, Harvard president Charles W. Eliot was in "a towering rage" at losing out to Hopkins. He wrote to Flexner: "Johns Hopkins is a small and weak university compared with either Harvard or Columbia; and Baltimore is a provincial community compared with either either Boston or New York. . . The personality and career of Dr. Welch are the sole argument for putting the institute in Baltimore—and he is almost sixty-six years old, and will have no similar successor."

"THE PROBLEMS WERE LIKE THOSE when we started the medical school. What were the fundamental subjects?" Welch

continued on page 126.

THE FLEXNER CONNECTION: WHAT ABRAHAM, SIMON, AND JACOB BEGAT

Perhaps no family has been more closely connected with Hopkins medicine than the Flexners of Louisville, Kentucky. Moritz Flexner, a Bohemian Jewish immigrant who had taught in Strasbourg, set up the tradition. Without funds to educate his nine children as he wanted, he required that the oldest sons earn the money to educate their younger brothers.

So it was that Jacob, the oldest, who became a well-established pharmacist, paid for Abraham to study classics at Johns Hopkins University. Abraham then urged his brother Simon to come to the new Hopkins medical school to study under William Welch.

Since 1886, Hopkins has bestowed upon Flexners four medical degrees, four undergraduate degrees, two fellowships, and one Peabody Conservatory diploma. "It is a nuisance to have my last name at Hopkins," says Charles Flexner, the latest of the dynasty, currently doing molecular biology research at Hopkins Hospital.



Charles Flexner, the latest in a long line of Flexners at Hopkins, is a molecular biology researcher.

A summary of the work of some of the more prominent Flexners follows:

Abraham: After receiving a BA at Hopkins in 1886 and then teaching high school in Louisville, he developed a school that received national attention for its innovative, effective teaching. With the money that earned, he paid for his older brother Simon to study pathology at the Johns Hopkins medical school. Abraham's first book, *The American College,* attracted such attention that he was chosen to survey American medical schools. The resulting 1910 report was a major impetus for reform. In 1912 Abraham joined the General Education Board of the Rockefeller Foundation; he led its project to found a school of public health.

Simon: Studying in Welch's pathology lab, Simon became a Welch protégé after confirming Loeffler's disputed discovery of the diphtheria bacillus.

After holding a professorship of pathology at the University of Pennsylvania, Simon joined his brother in New York at the Rockefeller Foundation, becoming director of its new Institute for Medical Research in 1902. He discovered a new treatment for meningitis amid a 1907 outbreak in Ohio, and conducted some of the earliest studies of polio, discovering its viral origins and mode of transmission.

Jacob: At 33, the pharmacist decided to go to medical school in Louisville. He then followed his brothers to Baltimore, working for two years as William Halsted's anesthesiologist. Returning to Louisville, he set up its first tuberculosis treatment center.

Morris: Son of Jacob, Morris graduated from Hopkins medical school in 1914 and then served in World War I as a medic in a French hospital near the front. Years later he was an associate, then full, then emeritus professor at the University of Louisville. He died in 1969.

John: Son of Morris, John got his Hopkins MD in 1954. Following a residency at Yale, he was made a fellow of hematology at Vanderbilt University. Now the American Cancer Society's clinical professor of oncology, he specializes in leukemia treatment.

Charles: Son of John, Charles received his medical degree from Hopkins in 1982 and served his residency at Stanford. He is now researching molecular biological methods to treat disease at Hopkins, targeting AIDS in particular.

"I came here for the same reason my father came here: Hopkins is the best medical school I could get into," says Flexner. Then he adds, as an afterthought, "The institution is too inbred—and I'm contributing to that." In fact, he married the boss's daughter: Hospital President Robert Heyssel is his father-in-law.

—MICHAEL BOWMAN

LATER PIONEERS

A sampling of researchers at Hopkins medical institutions who have built on the work of the founders.

COMPILED BY MICHAEL BOWMAN

In 1907 anatomist **Ross Granville Harrison** took spinal cord cells from a frog embryo, and added a drop of lymph sac fluid to create the first tissue culture. His technique, still the most efficient way of studying living cells and tissue, is used in *in vitro* fertilization and the cultivation of viruses for vaccines.

Biologists **Warren** and **Margaret Lewis** refined Harrison's technique, developing a clear culture medium to study individual cells. By 1915 they had made the first detailed description of the living cell.



Using tissue culture techniques, **George Gey** and his wife, **Margaret,** cultivated the HeLa cell line in 1951. It remains the standard research cell in molecular and cell biology.

Walter Jones, a chemist in Ira Remsen's laboratory in the 1890s, became the medical school's first professor of physiological chemistry. In 1914, he wrote the first known book on nucleic acids, in which he detailed the constituents and differences between nucleic acids of animal and plant origin.

John Howland was the first director of the Harriet Lane Home, which opened in 1912 as the nation's first children's hospital to be linked with a medical school. He did pioneering work linking biochemical research to clinical care, contributing to the understanding and treatment of such childhood illnesses as ricke ets and rheumatic fever.

In 1913, just three years after graduating from Hopkins medical school, surgeon **Walter Dandy** published the work that made him famous—a series of 10 reports on hydrocephalus, an accumulation of fluid within the cranium. He went on to develop an operation for the treatment of Meniere's disease, a procedure called ventriculography that replaced many exploratory operations and decompressions in the brain, and one of the first baseball helmets.

Zurich native **Adolf Meyer,** who believed that brain chemistry was responsible for much mental illness, is considered the founder of pyschobiology. He directed the planning and development of Hopkins's Phipps Clinic, which opened in 1913 and transformed psychiatry from the realm of asylum superintendents to a university discipline.

A 1900 graduate of the School of Medicine, **Florence Sabin** was the first woman appointed full professor at Hopkins (1917) and the first woman elected to the National Academy of Sciences (1925). She was an authority on blood cells and the body's defenses against infection, and her research forced a worldwide revision in theories of lymphatic development.



Joining the hospital in 1904, surgeon **Hugh Hampton Young** was renowned for his precision and innovations, from the surgical removal of the prostate gland to the development of a urological operating table. The Brady Urological Institute is named for "Diamond Jim" Brady, who donated the construction funds after Young corrected his chronically inflamed prostate.

Raymond Pearl began the nation's first academic department of biostatistics—quantitative analysis of biological processes—at the School of Public Health in 1917. He ignited a furor in the tobacco industry in 1938, when he was among the first to argue that tobacco in any quantity was harmful.

Abraham Lilienfeld expanded epidemiology from the study of infectious diseases to a scientific discipline concerned with all human illness, including cancer and heart disease.



Curt Richter came from Harvard to work in the laboratory of Hopkins psychologist John Watson in the 1920s. His carefully recorded experiments in psychobiology and animal behavior pioneered the study of cyclical internal mechanisms, now called biological clocks.

Dean of the medical school from 1929 to 1953, **Alan Chesney** began his career as director of the hospital's new syphilis division, where he investigated the mechanisms and immunity of the disease. He wrote what was long considered the definitive history of the hospital and medical school. The medical archives bear his name.



William Kouwenhoven was an electrical engineer who worked with the Hopkins surgical laboratory to develop an external defibrillator. With **Guy Knickerbocker** and **James Jude,** he discovered that applying pressure on the chest of an animal in cardiac arrest caused an increase in blood pressure. Now known as Cardiopulmonary Resuscitation (CPR), it has arguably saved more lives than any other medical technique of the past century.



A prominent Washington ophthalmologist, **William Wilmer** was offered funds by a grateful patient to start the Wilmer Eye Institute, which opened at the hospital in 1925. He formed a division of physiological optics to investigate perimetry, lighting, and visual acuity testing.

Perrin Long and **Eleanor Bliss** pioneered sulfanilomide therapy. Their first experiment—successfully curing streptococcal infections in mice—appeared miraculous. Long and Bliss reported in 1937 that the drug was just as miraculous for curing infection in a test group of patients. This was a breakthrough in the development of antibiotics and facilitated their use in World War II.



COLOR PHOTOS BY WILLIAM COUPON

Building on the work of Long and Bliss, **Caroline Bedell Thomas** developed the first preventive treatment for a major form of heart disease by using the drug sulfanilamide to combat rheumatic fever. She began and continues to evaluate one of the nation's longest-running studies to find early predicters of disease, suicide, and long life.

Leslie Gay had been treating a woman for hives with a new drug in 1948. It didn't clear up her hives, but it did cure her motion sickness. Gay further tested the drug—later known as Dramamine—on troop ships during World War II.

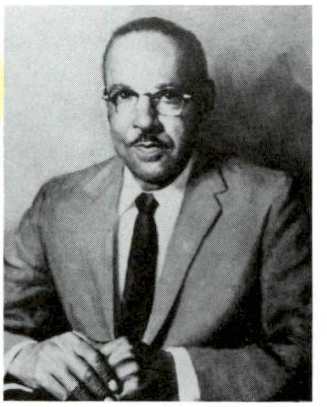
Anna Wolf was hired by the Rockefeller Foundation to organize a nursing school at the Peking Union Medical College, which opened the gateway to modern medicine in China in 1919. As Hopkins superintendent of nursing from 1940 to 1955, she laid the groundwork for the nursing program to become part of the university.



KARSH

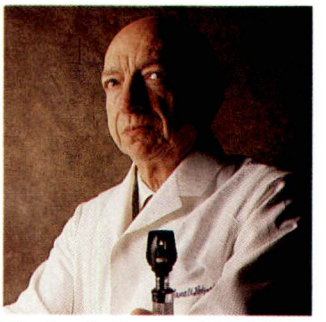
Having been denied the opportunity to seek a medical degree from Harvard because of her sex, **Helen Brooke Taussig** came to Hopkins and specialized in pediatric cardiology, using finely tuned examining skills to diagnose various heart defects. In 1944 she convinced chief surgeon **Alfred Blalock** that the technique he had refined in opening and bypassing arteries in dogs could be applied to infants to cure the "blue baby" syndrome, characterized by decreased blood flow to the lungs. Blalock thus perfected the open-heart surgery now known as the Blalock-Taussig operation.

As the first director of radiology at Hopkins concerned with radiation safety, **Russell Morgan** developed photoelectric timing mechanisms for automatic control of x-ray exposures. He served as dean of the School of Medicine from 1971 until 1975.



Vivien Thomas, a black surgical technician, trained many surgeons but was never permitted to operate on humans himself. A surgical assistant to Blalock, Thomas later was made supervisor of surgical laboratories and awarded an honorary doctorate in 1976.

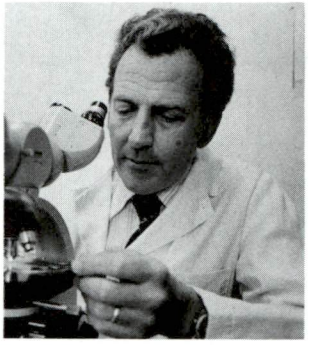
David Bodian, Howard Howe, and Isabel Morgan laid the groundwork for development of the polio vaccine with a series of critical discoveries in the 1940s and '50s. Bodian, chair of anatomy from 1957 to 1977, made other discoveries about nerve cells—their interconnections, function, and reaction to injury and infection.



The fourth director of the Wilmer Eye Institute and winner of a Lasker Award, ophthalmologist **Arnall Patz** discovered that overexposure to oxygen in incubators was causing blindness in prematurely born babies in the 1940s and '50s. His work with the Hopkins Applied Physics Laboratory yielded the development of the argon laser to seal leaking blood vessels in the retina.

A teacher of environmental health sciences at the School of Public Health for 60 years, **Anna Baetjer** called for increased studies of air pollution in the 1950s, when she was the first to link chromates to lung cancer among factory workers.

Pediatrician **Barton Childs** has advanced understanding of the genetic causes of disease during his 47 years at the hospital. He has focused on the inherited disorders of metabolism and the genetics of Lesch-Nyhan syndrome, a condition in which patients mutilate themselves.

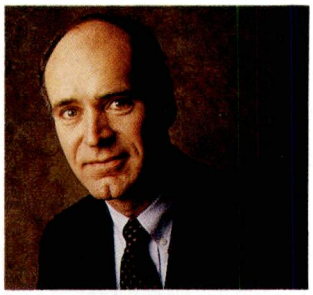


In 1968 oncologist **George Santos** was one of the first scientists to perform a bone marrow transplant in a human. Early on, he recognized the importance of giving bone marrow transplant patients drugs to suppress their natural immune reactions.

Dean of the medical school from 1957 until 1968, **Thomas Turner** (an expert on syphilis and now an authority on alcoholism) oversaw the doubling of the school's physical plant, the quintupling of the school's operating budget, and the additions of the biophysics, biomedical engineering, and laboratory animal medicine divisions.

Physician-in-chief emeritus, internist **A. McGehee Harvey** received the George M. Kober Medal from the Association of American Physicians and the 1977 Distinguished Teacher Award of the American College of Physicians. As a physiological investigator, he is known for his contributions on neuromuscular transmission, particularly in myasthenia gravis, and on autoimmune disease.

Molecular biologists **Daniel Nathans** and **Hamilton Smith** won the 1978 Nobel prize in medicine for their discovery and application of restriction enzymes, chemical scissors that cut genes at precise points. The findings signaled the beginning of recombinant DNA technology and genetic engineering, which are revolutionizing the biological sciences.



Bruce Reitz, a pioneer in heart and heart-lung transplants, in 1987 led the nation's first domino donor transplant, in which a heart-and-lung recipient gave up his heart to another patient.

Epidemiologist **B. Frank Polk** was one of the first to recognize the scope of the AIDS epidemic. He designed a major longitudinal study of the progression of HIV-1 infection in 4,944 gay and bisexual men. He began the hospital's AIDS outpatient clinic and helped establish the AIDS inpatient unit, the third in the country. After his death from a brain tumor last fall, the unit was named for him.

The current president of the Johns Hopkins Health System and the hospital, **Robert Heyssel** made Hopkins the first academic medical center to develop its own vertically integrated health care system. To the original hospital he added three other hospitals and a health maintenance organization. Presiding over two decades of physical and programmatic expansion, he also has contained hospital costs.

Elaine Larson has expanded opportunities for nursing research. At the Hopkins School of Nursing, she set up the world's first postdoctoral nursing program to explore better methods of infection control.

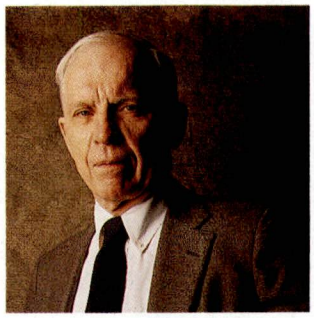
Neurologist **Richard Johnson** has done pioneering studies of how viruses invade the nervous system, in such diseases as encephalitis, meningitis, cerebral palsy, multiple sclerosis, and AIDS.

Epidemiologist **Susan Baker** has carved out new territory in injury prevention. She studies the statistics of fires, auto crashes, and occupational injuries, paving the way for preventive policies.

Alan Walker, professor of cell biology and anatomy, digs for prehistoric bones and analyzes them in the lab. Winner of a MacArthur Foundation Fellowship, Walker with Richard Leakey in 1985 discovered the 2.5-million-year-old "Black Skull," the oldest specimen uncovered of one early hominid species.

Sam Shapiro, professor emeritus of health policy and management at the School of Public Health, won the Charles F. Kettering Prize for his work showing the effectiveness of breast cancer screening. He is now assessing programs aimed at preventing disease and promoting healthy lifestyles among the elderly.

John Money, professor emeritus in psychiatry, has been as controversial as he has been revolutionary in the field of psychosexual development. He coined the terms "gender identity" and "gender role." He has studied people with birth defects of the sex organs, the syndrome of child abuse dwarfism, and the psychology of endocrine disorders.



Neurophysiologist **Vernon Mountcastle** has traced the codes and signals of the nervous system from the fingertips to the brain's cerebral cortex. His description of cortical columns earned him the Lasker Award, and in 1986 he received the National Medal of Science.

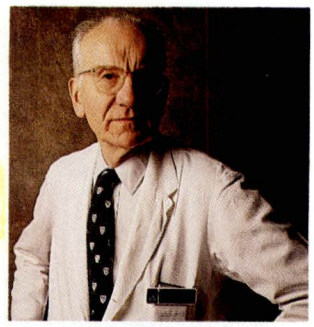
D.A. Henderson, stepping down this year as dean of the School of Public Health, directed the World Health Organization's successful smallpox eradication program. At the end of the 10-year program, smallpox existed only in glass vials in the laboratory. Now working to wipe out polio from the Western Hemisphere, Henderson has won the National Medal of Science, the Japan Prize, the Albert Schweitzer International Prize for Medicine, and the Dana Award for Health and Higher Education.

Albert Owens Jr. helped to establish medical oncology as a certified subspecialty, beginning in the 1960s with one model oncology unit at what is now Francis Scott Key Medical Center. Now the Hopkins Oncology Center, which he has directed since 1973, is expanding into an 88-bed complex.



Kimishige and **Teruko Ishizaka,** a married team of Japanese-trained immunologists, have been solving the mysteries of allergies since 1970. They identified IgE, the immune molecule that forms the basic ingredient of allergic reactions. Now allergists are better able to measure a patient's response to allergy-triggering proteins and the success of therapy.

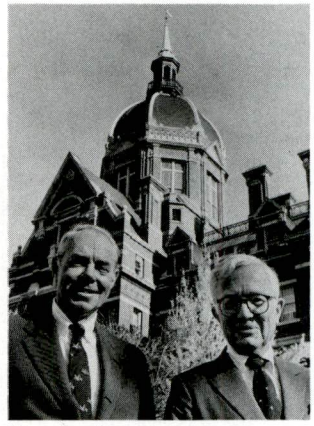
In 1978 **Solomon Snyder** won the Lasker Award for his discovery of the brain's opiate receptor sites. Snyder and colleagues at Hopkins and in Britain mapped the pathways in the brain where the receptors congregated and isolated the enkephalins—the chemicals that naturally inhibit them. Scientists are only beginning to tap the practical implications of neuroreceptor science and technology—a new field opened up in large part by Snyder—expected to yield new drugs for pain and mental illness.



Winner of the Senior Passano Prize and many other awards, **Victor McKusick** maps genes' locations on chromosomes, linking defects in the genes to diseases. "McKusick's Catalog" is an international compendium of genetic disorders and genetic factors in disease.

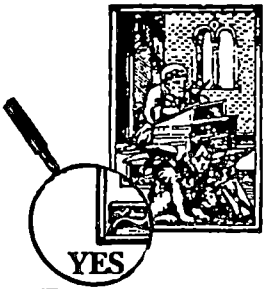
Urologist **Patrick Walsh,** working with a Dutch anatomist, developed a technique for operating on prostate cancer patients without severing important nerves, thus removing the major side effects of the operation: incontinence and impotence.

Donald Coffey, who holds appointments in pharmacology, oncology, and urology, has brought together students for groundbreaking research into the life of cancer cells. With them, he isolated the core of DNA, dubbed "the nuclear matrix." Today he is probing the matrix for the keys to the replication of cancer cells.



Heyssel and Ross

Richard Ross became medical school dean in 1975. Among the accomplishments in his tenure: constructing a preclinical teaching building and three research buildings, establishing a fund to launch young doctors in clinical departments on research careers, and dropping the admissions requirement of MCAT exams.



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A copy of the University's current annual report is available by writing to The Johns Hopkins Institutions, 225 Garland Hall, Baltimore, Maryland 21218, or by phoning (301)338-8046.

The Milton S. Eisenhower Library is pleased to present the latest Sherlock Holmes mystery...

The Adventure of the Baffled Bibliophile

IT WAS A SULTRY EVENING IN THE summer of '89, and all London lay under a kind of torpor from which Holmes and I were not immune. My wife being for some time in Surrey, helping her aunt attend an ailing spaniel, I had taken up again for a time the habits as well as the habitation of my bachelor days. So it was that I sat in that well-remembered armchair, absorbed in an account of the extraordinary proceedings of the new hospital in Baltimore, while Holmes lay stretched on the sofa immersed in an obscure monograph.

Thus we had remained, unspeaking, for a time when we both started at the sound of a feminine tread on the staircase. The noise was followed by the protesting tones of Mrs. Hudson, the dull thud of her solid form being shoved into a coat-rack, and finally by a delicate knock.

"Let the librarian in, Watson," Holmes said, stretching a long finger indolently toward the door.

I obeyed at once, and into the sitting room stepped a handsome woman of medium height, dark-haired, dressed in a subdued but elegant dress of bottle-green silk.

"You will forgive me, I pray, Mr. Holmes, for my intrusion, but I find myself in a crisis that admits no delay."

"Not at all. Please, be seated," said Holmes, leading her to the sofa with the innate courtesy he showed the opposite sex when the possibility of remuneration was involved. "I have no greater wish than to be of service to a fellow bibliophile, which, I perceive, you are."

"Why, so I am, Mr. Holmes," she said. "How did you know?"

"I perceive that you walked on the balls of your feet, as one who is used to reaching for heavy volumes on high shelves. But please, let my friend and colleague, Dr. Watson, and me know how we may be of assistance."

"You must know, Mr. Holmes, that my name is Anne Griffith, of Llanvihangel. For many years my family has had the honor of raising funds for the Milton S. Eisenhower Library, across the Quadrangle from Gilman—you remember the brick and glass structure no doubt. The library is held in esteem the world over, and since 1931 has been aided not only by the small efforts of my sires, but by a strong band of patrons known outside their own circle only as The Friends. Most regrettably—for the library not less than for myself—my great-uncle was killed a fortnight ago after falling from a camel whilst on a botanical tour of Arabia." Here she stopped, lowering her fine eyes for a moment. "Mr. Holmes, you see before you the last of the Griffiths, and the first ever to be forced to abandon her duty. For you see, Mr. Holmes, but a handful of these Friends are known to me; my great-uncle died without revealing to me the names of these worthy people so indispensable to the success of our enterprise."



Illustration courtesy of Weidenfeld and Nicolson, London.

"My dear Miss Griffith," he said, his smile betraying a hint of bitterness, "as is so often the case, I am not wholly unacquainted with your predicament. My brother Mycroft...but perhaps that is better left unsaid. Nevertheless I must tell you that what you request is, even for me, impossible. Your only course is to strengthen your band, including not only those members proven in the past, but new Friends willing to support your cause. An American government organization, the National Endowment for the Humanities, has agreed to give one million in American dollars if the Friends will pledge four million in new donations by July 1991. I realize, of course, that you are well on your way to meeting that goal by having raised one million already.

"Moreover," said Holmes, a familiar gleam lighting his eye, "I myself will give my own magnifying glass to whoever possesses the character to help you in your hour of need."

The lady dared for the first time to look at us with something like hope. "Oh, Mr. Holmes, do you really suppose there are such people in the world?"

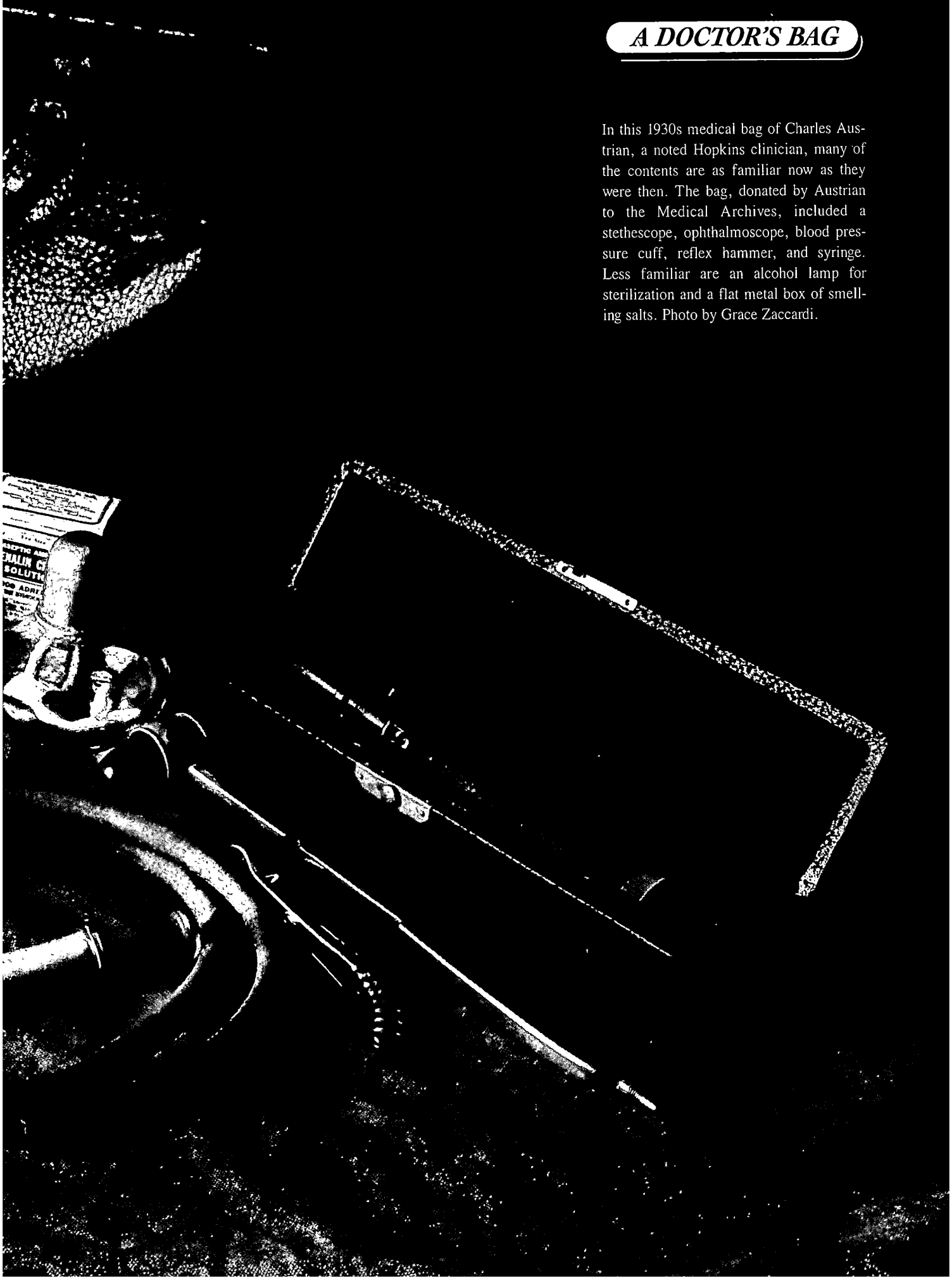
"Our only hope is that these elusive Friends will reveal their identities to you through the post. Perhaps they will even be willing to fill out the reply card you have shown me. This accomplished, there will be no need for you to be baffled anymore."

Holmes smiled and turned his gaze into the dark night outside.

The Friends of The Johns Hopkins University Libraries

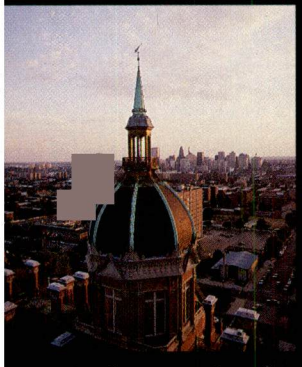
DIGIFOLIN

A DOCTOR'S BAG

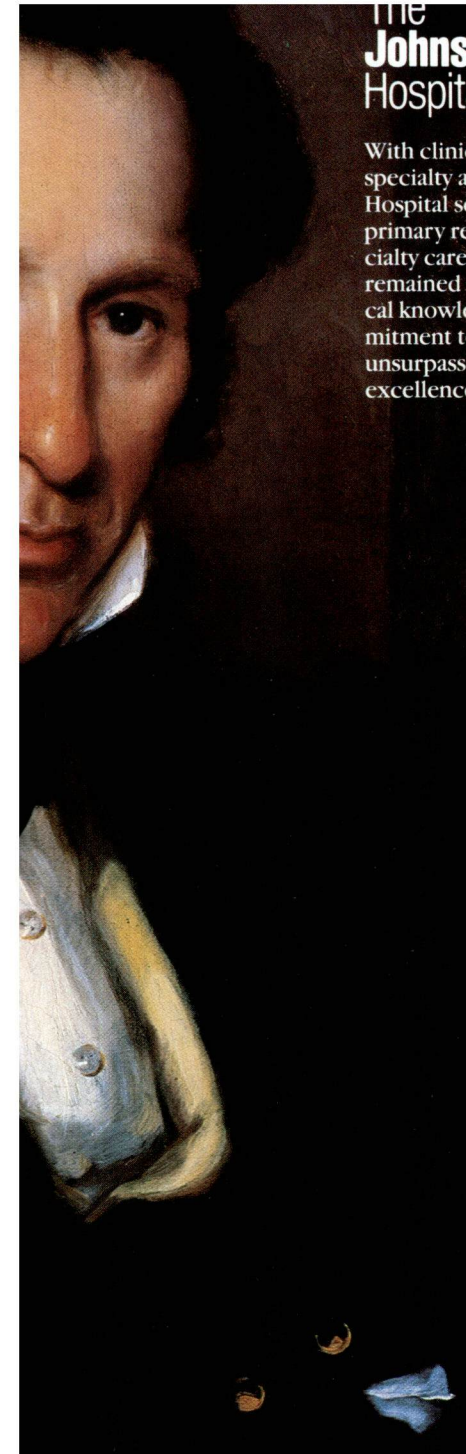


In this 1930s medical bag of Charles Austrian, a noted Hopkins clinician, many of the contents are as familiar now as they were then. The bag, donated by Austrian to the Medical Archives, included a stethescope, ophthalmoscope, blood pressure cuff, reflex hammer, and syringe. Less familiar are an alcohol lamp for sterilization and a flat metal box of smelling salts. Photo by Grace Zaccardi.

Johns Hopkins. His vision was to provide a place of healing and discovery for the people of Baltimore.

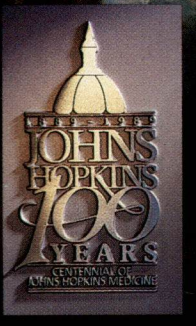


He was demanding. His dedication to medical excellence … uncompromising. His vision was to provide the people of Baltimore with a [illegible] care second to none in [illegible] the reputation has grown, so [illegible] commitment. One hundred years [illegible] Johns Hopkins Health System has [illegible] major hospitals and over 38 health plan locations… bringing Hopkins quality care to the people of Baltimore. The commitment continues.



The **Johns Hopkins** Hospital

With clinical programs in every specialty area, The Johns Hopkins Hospital serves as Baltimore's primary referral center for specialty care. Hopkins has long remained synonymous with medical knowledge, leadership, commitment to patient care and an unsurpassed reputation for excellence.



The **Francis Scott Key** Medical Center

A community-based teaching hospital and long-term care facility, Francis Scott Key is dedicated to serving its communities and has referral centers in numerous specialty areas including: geriatric care, trauma care, neonatology, cardiology, alcohol and substance abuse, dialysis and gastroenterology. It is also the home of the Baltimore Regional Burn Center.

The **Homewood** Hospital Center

The Homewood Hospital Center provides you and your family with everything from primary care to major inpatient surgery. Homewood North offers a comprehensive array of routine outpatient services and specialty services. And Homewood South offers the full resources of an acute-care hospital with diverse medical and surgical specialties and a 24-hour emergency room.

The **Johns Hopkins Health Plan**

Meeting the health insurance needs of Maryland communities the Hopkins HMO offers members affordable and comprehensive, prepaid health care. The Hopkins Health Plan has over 38 locations throughout central Maryland, providing a complete array of medical services near home and work. Additionally, th Hopkins Multiple Option Health Insurance program provides members with maximum flexibility in selecting the physicians ar hospitals of their choice, while realizing substantial savings in t cost of health care. All members have access to the resources, capabilities and world-renowne facilities of the entire Johns Hopkins Health System.



The commitment continues.

JOHNS HOPKINS HEALTH SYSTEM


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EPILOGUE

BACK TO THE FUTURE

BY JOANN RODGERS

"Let us hope that before the last sands have run out from beneath the feet of the years of the 19th century, it will have become a model of its kind, and that upon the centennial of its anniversary, it . . . shall still compare favorably . . . with any other institution of like character in existence. . . ."
—John Shaw Billings

One hundred years later, the founders' vision is still keeping Hopkins medicine on the forefront.

AS THE STORIES in these pages testify, the "model of its kind" to which Billings refers clearly emerged from the convergent genius of individuals nurtured by mastery, serendipity, money, status, and healthy doses of good will and stamina. Just as clearly, genius of this kind rarely lasts beyond its generational boundaries. But sometimes, where its legacy is carefully conserved, the energy penetrates—like so much intellectual DNA—to dominate in every generation thereafter.

On the day, coincidentally, that the Johns Hopkins Medical Institutions officially announced their Centennial birthday plans, School of Medicine Dean Richard Ross invited A. McGehee Harvey, Jeremy Nathans, and Carl Pabo for an informal lunch. They ate club sandwiches and drank Diet Cokes in the dean's private conference room. The lunch was convened on behalf of John Maddox, a British theoretical physicist and editor of the London-based journal *Nature*.

Officially the subject was the June Centennial celebration *(see box, page 104)*. But in a way there were century-old agenda as well. Billings and Barker, Gilman, Welch and Osler, Halsted and Kelly, would have been comfortable with the company, if not

A thermographic image shows hot and cold areas of the hand, helping to fine-tune pain treatment.

with the plastic utensils. Their blueprint—for an institution that melded clinician with scientist and teacher with student; that made professors full-time clinical chiefs and a hospital a teaching lab for a medical school; that gave glory space to basic researchers—was very much in evidence that hour.

At the head of the table sat Ross, courtly, formal, a professor and former chief of cardiology who published more than 100 papers on cardiovascular physiology and disease. To his left, Harvey, 78, Hopkins chief of medicine for 27 hears, a post that *Time* magazine once described as "as honored by doctors as a Supreme Court robe is by lawyers." This author of five books and chair of the Centennial counts Ross among the 2,151 students and 866 house officers he officially taught at Hopkins while building a reputation among his peers as a master diagnostician. (Ross still calls him "Dr. Harvey.")

Nathans, a molecular geneticist of vision, literally and figuratively, is an evident source of joy to Ross, not only for his elegant exploitation of genetic accidents in the evolution of sight, but also for putting the truth to the Hopkins dogma that both physicians and basic scientists can learn and advance the language of illness and suffering. Nathans is the son of Daniel Nathans, who with fellow Hopkins physician Hamilton Smith won the 1976 Nobel prize for the discovery of restriction enzymes, ushering in the era of genetic engineering that fuels his son's career.

To Ross's right was Carl Pabo, like Nathans a PhD, who will make biological activity as accessible to exploitation as his colleagues in the "hard" sciences have made Newtonian and particle physics.

The table talk that day crackled with the meaning as well as the words of science. Pabo drew conceptual parallels for physicist Maddox among the work of the crystallographer, the protein chemist, and the biologist. Harvey and Ross, objects of well-earned reverence by the youngsters at this command-performance meal, became students of their students. Ross prodded Nathans to draw pictures on napkins to explain his findings in the genetics of color blindness and their implications for understanding human biology and disease.

Billings would have smiled. Here was the mental energy to send the model of its kind into the next century.

Joann Rodgers, a nationally published medical science writer, is deputy director of public affairs at JHMI.

As Hopkins medicine enters its second century, the model of its kind still nurtures individuals of enormous talent.

CENTENNIAL PLANS

Although a one-day ceremony commemorated the opening of Hopkins Hospital on May 7, the big bash—fireworks, concerts, reunions, symposia, and a Centennial ball—takes place June 7 to 11. Some highlights:

***June 7:* A grand academic procession, featuring hundreds of local and international leaders in medicine, nursing and public health. President George Bush has been invited to give the keynote address; the U.S. postage stamp honoring Mr. Johns Hopkins will be unveiled. Plus a special concert of the Baltimore Symphony Orchestra, with flutist Jean-Pierre Rampal.**

***June 8:* "Thomas Eakins: Image of the Surgeon," a special Centennial exhibit, opens at the Walters Art Gallery. Eakins's two famous surgical portraits join earlier depictions of surgeons and anatomists ranging from Vesalius to Rowlandson and Hogarth.**

***June 9:* Gladys Knight and the fireworks: Hopkins employees hear Gladys Knight (minus the Pips) at two free concerts. Later, all are welcome to Hopkins' Salute to the Citizens of Maryland—a fireworks show at the Inner Harbor.**

***June 10:* A gala banquet and ball, featuring humorist Art Buchwald.**

Throughout the celebration, renowned speakers will lead symposia on critical issues in medicine, nursing, and public health. Hopkins faculty will discuss the latest findings on topics including AIDS, cancer, the mind and brain, the heart, and imaging.

For information or tickets—it's not too late—write the Centennial Office, 550 N. Broadway, Suite 1100, Baltimore 21205, or call (301) 955-2998.

EVEN THE BEST LEADERS CANNOT predict milestones. They can only be willing to risk the chance to make them happen. "The gamble, if that's what to call it," Ross has said, "is to bet on the payoffs from lifelong commitments to reserach as well as practice, to the traditions that have served us so well. I believe the risk they took was worth it 100 years ago, and I think it still is."

The risk was and remains stunning.

At its founding, the School of Medicine became the first to be intimately allied with both a university and a hospital. Today that hospital is a collection of more than a dozen minihospitals and centers, 37 buildings, 226 separate clinical services, more than 1,000 beds, 1,600 hundred physicians, 500 residents, 1,500 nurses, and 1,000 research projects combined under the direction of an overarching administrative system.

At its founding, the Hopkins medical institutions became the first to form an integrated union of people involved in teaching, research, and patient care. So great was the synergistic power and productivity of this triangle that it established a pattern adopted by virtually all American medical schools and gave rise to the era we know as scientific medicine. Today, juggling heavier and heavier demands for patient services, quality assurance, research support, and teaching time, faculty and clinical staff resist the lure of quick-fix or commercial solutions to problems.

At its founding, Hopkins elevated medical education to the graduate level and insisted on a four-year curriculum when the vast majority of medical colleges did not even require a high school diploma and sent students out to practice after as little as eight months of training. Today, amid changing patterns of practice, skyrocketing costs of care and research, ballooning knowledge, and shifting social priorities, Hopkins is still taking risks by altering its curriculum, protecting grant-poor young researchers with its own funds, and seeking scholars rather than technocrats.

Billings, the intellectual architect of the medical institutions, believed Hopkins would become a synonym for medical excellence if it nurtured people who would advance knowledge as well as apply it. By now, the litany of the historic payoffs of Billings's vision is sweetly familiar. But what of payoffs in our own time?

The school can say that more than 80 percent of its graduates receive their top choices for residencies; that it is among the top three medical schools in gaining competitive funding through the National Insti-

tutes of Health, and that its share of the total NIH fund pool is rising faster than the average of the 10 best-funded schools. Moreover, at a time when medical school applications are falling nationwide to less than two hopefuls for each spot, Hopkins gets more than 25 per spot.

To meet the pressures of regionalization, competition, cost-cutting, and a shrinking pool of patients for teaching and research, the three-year-old Johns Hopkins Health System, under the guidance of Robert Heyssel, offers managed, primary, and tertiary care in a plan that integrates Hopkins specialists with a second major teaching hospital, a community hospital, and a health maintenance organization.

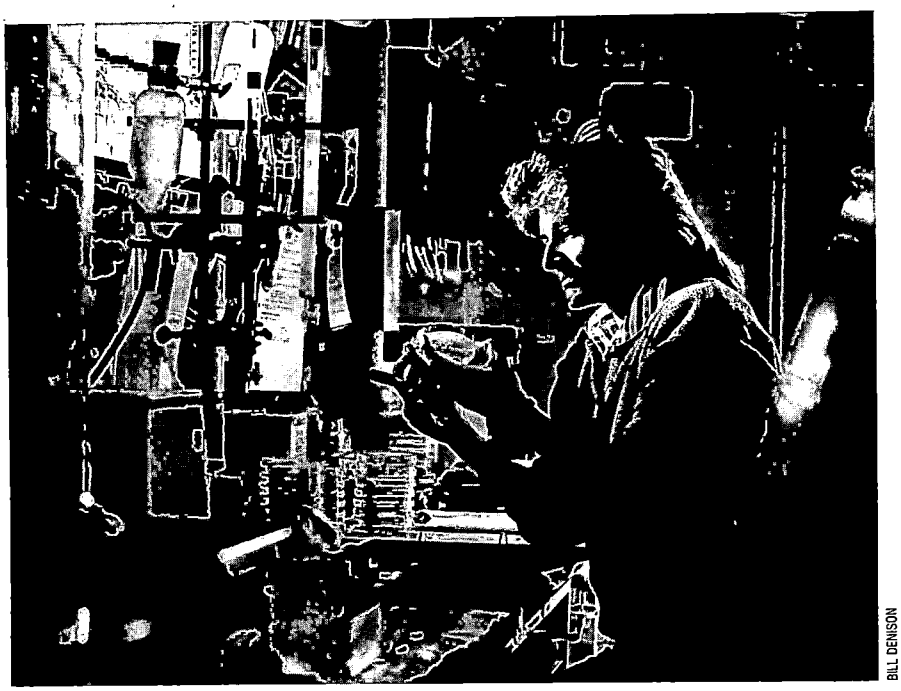
In the past few years, Hopkins physicians and scientists have developed a test for predicting bone marrow rejection, and a clinically sound prenatal test for Huntington's disease and deadly blood disorders.

Victor McKusick is leading the worldwide effort to map the human genome. Solomon Snyder's discovery of the brain's own opiates created the field of neuroreceptor technology. Hopkins scientists were the first to implant an automatic implantable defribillator and a programmable insulin pump. They first used a PET scanner to image neuroreceptors in a living brain.

Others developed a successful drug treatment for post-stroke depression, performed the first "domino donor" organ transplant procedure in the United States and executed a 22-hour operation to separate Siamese twins joined at the base of the brain.

Hopkins scientists proved that a few pennies' worth of vitamin A dramatically reduced both blindness and childhood deaths from infectious diseases in the Third World. They developed interventional radiology balloon techniques to repair vascular defects, and were the first to culture human lung mast cells to advance the knowledge and treatment of asthma. Hopkins neuroscientists are the world's premiere team performing and evaluating the results of hemispherectomy, a radical removal of half the brain that has saved more than a dozen children from institutionalization and full disability due to chronic, severe seizures.

Today neuroscientists are working to culture neurons for the first time—a feat that would greatly advance the fields of developmental neurobiology and mental illness. Cardiologists and neuroscientists recently combined knowledge and skills to identify what may be the first molecular defect—involving calcium channels—linked to a heart disorder. A Hopkins basic scientist has become the first to "visualize thinking," by wedding sophisticated computer technology with metabolic and electrical tracking of neurons.



BILL DENISON

Today, amid changing patterns of practice and skyrocketing costs of care and research, clinical science still finds support at Hopkins.

Hopkins has taken a lead in AIDS research, treatment, and education, with inpatient and outpatient facilities, more AIDS research dollars than any other medical school, designation as a national AIDS vaccine testing center, and an institute to study retroviruses and AIDS virology.

At its founding, Hopkins became both a magnet for the best medical minds and an exporter of them to the world. And for a century Hopkins-trained scientists have won worldwide acclaim for their contributions at other institutions where they took the Hopkins tradition of excellence. Indeed, Hopkins is a synonym for medical excellence. Novelists, moviemakers, toy makers, and even cartoonists attach Hopkins credentials to characters who may not always be heroes, but are always skilled.

HISTORIAN DANIEL BOORSTIN ONCE wrote that the path to modern medicine, forced open during the Renaissance, "obviously could not be opened by a tame professor of high eminence." Instead, said Boorstin, "the man who dared point the way" would have to be something of a rebel and risk-taker. Such a one, he argued, was Theophrastus Bombastus von Hohenheim, also known as Paracelsus, a man of the early 16th century who never earned a medical degree and tweaked the establishment as long as he lived.

It's tempting to speculate that Billings, Gilman, and their cohort at Hopkins 100 years ago were admirers or even students of Paracelsus. Like him, they were master opportunists in the best sense of the word. They, like Paracelsus, had a vision of how things might be and the discipline and will to devise a system for bringing about lasting change.

If the genius and the circumstances of that time no longer exist, the architecture survives along with each generation's will to build on it. Billings might have taken his text from Paracelsus's advice to physicians to "take heed what is told thee; the rest shall be sought after until the art is found."

At Hopkins, students still learn by doing, at the bedside and in the lab; charity care is still a priority; the Health System responds to the new health economics; there is rising concern for the aged, the young, and the weak of body and mind; there is attention paid to the humanity of physicians, as well as to their need for skill and knowledge.

As Hopkins medicine enters its second century, the model of its kind still nurtures and rewards individuals of enormous talent. Some people whose work will create the medicine of the 21st century are now at Hopkins. Which ones they are may not yet be as apparent to us as the founders are now, seen through the magnified lenses of 100 years of hindsight. But they are there. So is the energy. When the time is right, they and their visions will converge. ■

FOR MORE INFORMATION . . .

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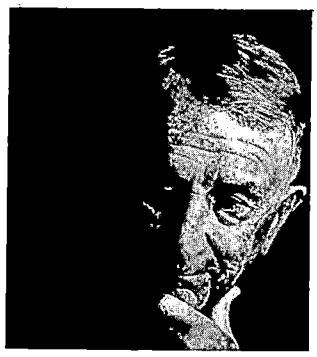
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A. McGehee Harvey



Alan M. Chesney

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The Dome—more familiar from the outside as a symbol of Hopkins Hospital—is now lit artificially. In the past, however, light from the multipaned windows of the inner dome illuminated the rotunda and walkways. The main staircase rises to the fourth floor, after which a steep stairway—accessible only to the few who have keys—leads to the catwalk around the Dome's exterior.
Photo by Grace Zaccardi.

JOHNS HOPKINS MEDICINE

A CENTURY OF GENEROUS GIVING

When The Johns Hopkins Hospital held its formal opening on Tuesday, May 7, 1889, it must have been the social event of the year. Guests began arriving an hour before the appointed time and included the most socially and politically prominent men and women of Baltimore, as well as distinguished out-of-town guests. According to the Baltimore *Sun* report the following day, "lines of private carriages, doctors' buggies and other conveyances stood on both sides of Broadway for several squares." Even more telling: "A large crowd of men, women and children assembled in front of the main entrance and eagerly scanned the faces of those who held the much-desired cards of admission."

Such a response from the people of Baltimore—a response we normally associate with the premiere of a Hollywood film—says much about the regard in which the Hospital has been held from the start. It was not celebrity alone that attracted the onlookers. It was partly the sense that here was a new enterprise totally unlike any other; and it was devoted to serving not just the well-to-do, but "the indigent sick without regard to sex, age or color," "strangers," and "those of our own people who have no friends or relatives to care for them in sickness."

With the citizens' high regard came outpourings of support, however modest. People from the surrounding community and the outskirts of Baltimore sent gifts of supplies, food and household articles. Thus, from the start, Johns Hopkins Medicine found its support—and often its direction—from people of humble and great means. Behind each gift is a story, a few of which are recounted here.



Garrett, center, with (clockwise, from bottom left) King, Rogers, Gwinn, and Thomas

The original gift, of course, is the munificent bequest of Johns Hopkins, the enormously rich and influential Quaker merchant. If it were not for his family's ban on marriage between cousins, Hopkins might have had a wife and children to inherit the bulk of his estate. However, when he was forbidden to marry his first cousin, Hopkins vowed to marry no one else, and thus was left with substantial assets and no benefactors. Careful deliberation and consultation with friends, combined with wisdom and generosity of spirit, led to the historic bequest and the founding of the University, Hospital, School of Medicine and School of Nursing.

As luck would have it, the "ample provision" in his will for the School of Medicine shrank along with the fortunes of the Baltimore & Ohio Railroad, whose stock comprised most of the University's endowment. Plans for the school were about to be shelved when five young women—four of them daughters of Hopkins trustees—declared their intent to raise the money needed, with the stipulation that women be admitted to the medical school on equal terms with men. They also insisted on high standards of admission, which they felt were intrinsically important for the medical school and an important step in raising the level of collegiate education for women. The women—Mary Elizabeth Garrett, Elizabeth King, Julia Rogers, Mary Gwinn and M. Carey Thomas—organized the Women's Medical Fund, which ran a sophisticated national campaign that netted the $500,000 needed to open the school. Garrett donated approximately $350,000 of the amount, but it was the persistence, vision and political acumen of all the women that helped change the course of medical education.

So strong was the attraction of the new Hopkins enterprise that the first gift to Johns Hopkins Medicine—aside from the bequest of its namesake—came years before the School of Medicine opened in 1893. Apparently inspired by President Daniel C. Gilman's 1876 inaugural address, a prominent Baltimore physician, Henry Willis Baxley, left a bequest of nearly $24,000 to establish a professorship in the proposed School of Medicine. In 1901, the Fund had grown to $50,000 and was used to endow the Baxley Professorship in Pathology. The Professorship was the first of 54 at the School—endowments that have enabled Hopkins to attract the finest minds and guarantee them freedom to pursue research and set new directions in medicine.

A major innovation at the new School of Medicine was the introduction of full-time appointments for clinical faculty, made possible through support from the Rockefeller-funded General Education Board (GEB). John D. Rockefeller became interested in medical philanthropy through the groundbreaking work at Hopkins, brought to his attention partly through the impact of William Osler's *Principles and Prac-*



John D. Rockefeller

tice. He named William H. Welch, the first appointed member of The Johns Hopkins University medical faculty, as president of the board of his newly established Rockefeller Institute for Medical Research in New York City. Abraham Flexner, author of the famed report that held up Hopkins as the model for medical education, had introduced Welch to Rockefeller's principal adviser and was instrumental in the aid Hopkins received from the GEB. For two decades, the GEB gave Hopkins funds that made full-time clinical appointments possible in the departments of surgery, medicine, pediatrics, obstetrics, psychiatry, and ophthalmology. With this support, Welch assembled the first faculty of medicine at The Johns Hopkins University. Meanwhile, he also guided the completion of the Hospital's buildings, launched the postdoctoral program of medical education, and steered the medical school to its opening in 1893.

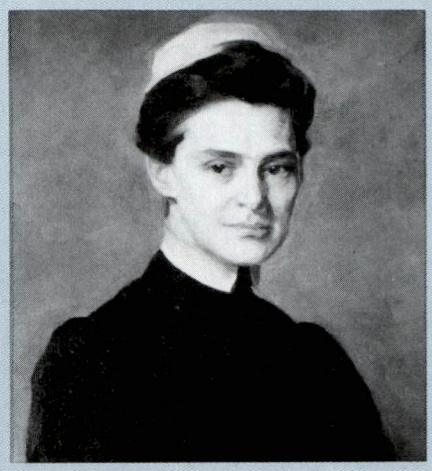
Another ambition of Welch—the founding of the School of Hygiene and Public Health—was made possible by Rockefeller wealth when the Rockefeller Foundation gave Hopkins a grant of $6 million in 1916. Welch assumed leadership of the new school, the first of its kind in the world, and established it as an international center for training and research. The largest institution of its kind today, the school remains the world leader in public health.

Just as women were responsible for the opening of the School of Medicine, so another woman—Harriet Lane—was key in the establishment of what is now the Hopkins Children's Center. The sole survivor of a family of six, Lane was adopted at the age of 9 by her uncle, James Buchanan. Her poise, charm and healthy good looks served her well as Buchanan's social hostess during his ambassadorship in London and his 1857 to 1861 term in the White House. Courted by many suitors (including the English nobility), she chose to remain single until the age of 36, when she married a well-to-do banker, Henry E. Johnston. Fourteen years later, their idyllic marriage was marred by the death of their only two sons, who suffered from rheumatic heart disease. Johnston's bequest of $500,000, activated after his wife's death in 1904, established the Harriet Lane Home for Invalid Children. Harriet Lane Johnston herself bequeathed $90,000 to Hopkins for three scholarships in memory of her husband and children, and left the residue of her estate to the Home, now the Johns Hopkins Children's Center.

The M. Adelaide Nutting Chair in Clinical Nursing, created in 1985, is a tribute to the second superintendent of the Hospital's nursing school and to the generations of nursing alumni who, over the course of 71 years, raised $1.5 million in endowment funds.



Harriet Lane Johnston



M. Adelaide Nutting

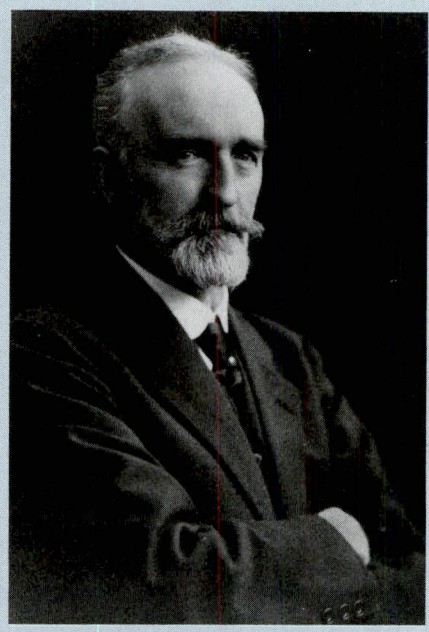
Housed in the new School of Nursing, the Chair fulfills a dream first articulated in 1914 when Nutting proposed that the alumni raise enough money to endow their school. Hers was a revolutionary idea at a time when nursing schools supported themselves largely through the labor of the students. Nutting eventually accepted a position at Columbia University where she became the first nurse to hold a professorship. Her leadership in the profession served as a beacon through the years as the alumni continued to raise money for the Fund and kept alive the hope of establishing a university-based nursing school.

Shaping the course of Hopkins Medicine did not always fall to its alumni and friends. Some donors had no relationship with Hopkins. Joseph Rafael DeLamar, a colorful sea captain and businessman, is a case in point. Born in 1843, DeLamar ran away to sea after his father, an Amsterdam banker, died when the boy was 6. He stayed with the sea, traveling the world over, until his 20s, when he began the first of many profitable ventures—salvaging sunken vessels and anchors. His adventurous spirit and keen business sense led him from trading in Africa to mining in Utah, where he amassed a large fortune. A man of many talents, he became an organist and skillful violinist, raised rare plants and flowers, collected many valuable works of art, and became a state senator. Despite having traveled to the far corners of the world, DeLamar never laid eyes on Hopkins; but his wide-ranging interests and insistence on quality must have prompted his magnificent bequest to Hopkins of $4 million in 1919. He left a significant legacy, for his gift not

only endowed the DeLamar Chair in Physiological Chemistry but sustained the medical school through the Depression.

As in the DeLamar case, the Wilmer Ophthalmological Institute was founded at Hopkins not because of the donor's attachment to the Hospital but because of the Hopkins reputation—and a string of fortuitous events. The donor, Aida de Acosta Root (soon to be Mrs. Henry Breckinridge), originated the idea of endowing an institute for her famous Washington, D.C., eye surgeon, William H. Wilmer. Greatly impressed by his skill and character, and distressed by the inadequacy of the facilities available for his clinical practice and research, she masterminded a fund-raising effort that eventually secured $3 million from the General Education Board and individuals such as Harry P. Whitney, E.H. Harkness and J.P. Morgan. In the complex negotiations that proceeded on many fronts, Abraham Flexner played a key role in linking the Wilmer Foundation with the Rockefeller money and Dr. Wilmer with Hopkins, with the happy result that the Wilmer Institute was established at Hopkins in 1925.

Grateful patients like Aida Breckinridge have had enormous influence on the Hopkins Medical Institutions. Prominent among these was James Buchanan Brady, the legendary "Diamond Jim," devotee of jewelry, food and Broadway theater. Excess was Diamond Jim's claim to fame. He loved precious stones, particularly diamonds—"my pets," he called them—and wore them all over his person, even on his underwear. His favorite ring, a huge diamond surrounded with rubies, covered three fingers from the base to the first knuckle. His gustatory prowess was even more extraordinary. There is not room to set forth his daily fare; suffice it to say his midmorning snack alone consisted of two or three dozen clams and oysters. He was as lavish with his friends as with himself and afforded this excess through a lucrative career in sales. Hopkins also was a beneficiary of his largesse due to the skill of Dr. Hugh Young, who successfully operated on Brady for a urological problem in 1915. The grateful patient promptly donated $240,000 for building and equipping the James Buchanan Brady Urological Institute and pledged $15,000 a year for operating expenses. Upon his death, he left the Institute an additional $387,000.



Henry Phipps

The Brady Institute was relocated to the Marburg Building in 1982 when Hopkins became the first medical center to combine urology with its medical counterpart, nephrology, opening up new avenues of treatment and research for genitourinary disorders. One of the original Hopkins structures on the National Register of Historic Buildings, the Marburg Building has charm and elegance, having opened in 1914 as a pavilion for private medical patients. Its construction was made possible by gifts totaling $180,000 from William A. Marburg and other family members in memory of William's brother, Charles. Co-founder of the family's tobacco business, Marburg served The Johns Hopkins Hospital for 30 years as a trustee and was highly regarded for his dedication and generosity to the Hospital. In 1919, he gave another $100,000 for general endowment in memory of his mother.

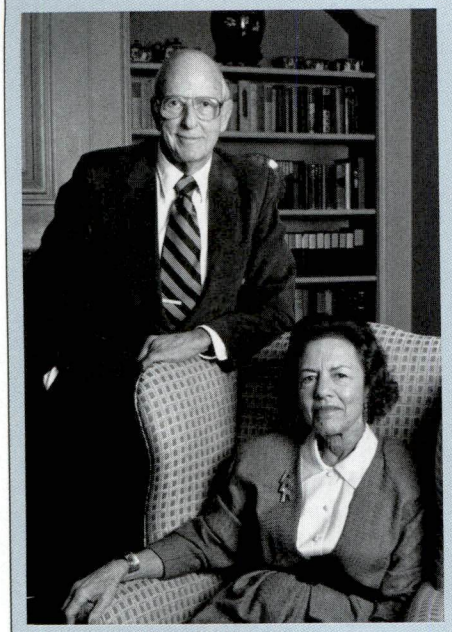
Another trustee, Henry Phipps of Philadelphia, was not given to attending the meetings or actively participating on the Board, but he was extremely generous and he often visited the Hospital, on his way to and from Florida, to see the fruits of his generosity. A steel magnate and associate of Andrew Carnegie, Phipps gave Hopkins the princely sum of $2.5 million over two decades, beginning in 1903 with the funding of a clinic for the study of tuberculosis. His greatest contributions were his suggestion to Welch that Hopkins would be a good setting for "treatment of the insane" and his offer to support such a venture. The resulting Henry Phipps Psychiatric Clinic set new standards for the care and study of mental disease and disorders.

After the founding gifts, the first gift to the School of Medicine of any magnitude from outside sources was from Christian A. Herter, M.D., and his wife, who endowed a lectureship in 1902 with a gift of $25,000. A student in Welch's laboratory in 1885, where he worked on experimental myelitis, Herter traveled to Zurich during the winter of 1887-88, where he studied with neurologist Forel. The Herters' first child, Forel, died of spinal meningitis at the age of 2, and it is thought that the lectureship was established in their son's memory. Herter explained in a letter to Welch that he chose Hopkins for the gift because "through my contact with you I learned for the first time that there are men in the world who are ready to dedicate their lives to science." Herter spent most of his career in New York City and was instrumental in the establishment of the *Journal of* Biological Chemistry and the Rockefeller Institute, but his name has forever been linked at Hopkins to the school's best endowed and most prestigious lectureship.

It is worth noting that Herter was the uncle of President Dwight D. Eisenhower's Secretary of State, Christian A. Herter, whose name is memorialized at the Hopkins School of Advanced International Studies (SAIS) through a professorship in American foreign policy established by his widow in 1967. This Christian A. Herter was, in turn, a good friend of another significant donor to Hopkins medicine: William L. Clayton, a leading world cotton merchant and senior world statesman.

Clayton and his wife gave Hopkins more than $1 million in 1947 to endow the Susan V. and William L. Clayton Fund for medical research. Since that time, the Clayton family has been supremely generous to Johns Hopkins. In 1983 the new Clayton Heart Center, made possible through their support, was dedicated in their honor.

In 1947, Hopkins also received a magnificent gift of $2 million from Mrs. May McShane Jenkins in memory of her late husband, Thomas C. Jenkins, who had been a student at Hopkins in the 1880s. Her gift was specifically for the establishment of a department of biophysics, and by agreement was divided among three divisions: School of



Leonard and Ann Greif



Lyn and Harvey Meyerhoff



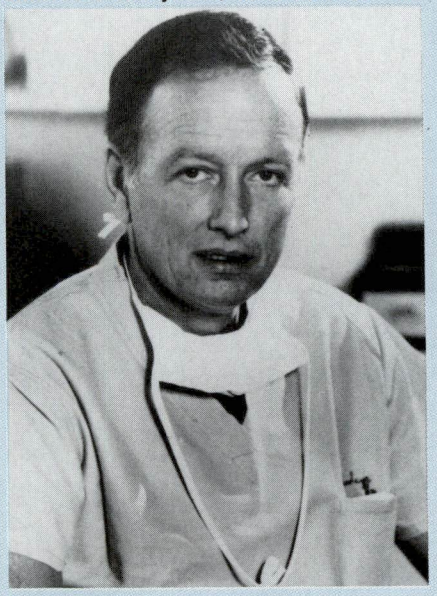
Henry J. and Marion Knott

Medicine (40%), Homewood (40%), and School of Public Health (20%). In addition to the original intent, one of the eventual outcomes of this far-sighted gift was the establishment of the Department of Biomedical Engineering. Mrs. Jenkins left another $5 million to biophysics upon her death in 1957.

Another woman, Mrs. Charles Denison, established the School's first permanently endowed scholarship fund in 1920, at a time when only a loan fund existed for needy students. The gift of $100,000 was made in memory of her son, Henry Strong Denison, who had graduated from the School of Medicine third in his class and barely started his career before he died of an illness in 1912 at the age of 29, leaving a wife and two children. While in medical school, he became deeply interested in research through the inspiration of Florence Sabin, M.D., and published two papers as a student. Denison scholarships, commonly awarded to fourth-year students who showed promise in medical research, became much prized.

As this small sampling shows, the history of Johns Hopkins Medicine has been shaped by men and women of vision who could foresee the implications of their generosity on the course of medical education, research and patient care. Hopkins today is supported by donors who share that vision and who continue to help Hopkins point the way to the future.

These include: Norman Rockwell and Willard Hackerman, who both have built houses that provide families of cancer patients a home-away-from-home; the late Stuart S. Janney Jr., a former Hopkins trustee who left a $1 million legacy to the Oncology Center; the many members of Baltimore's Blaustein and Rosenberg families, who have given more than $1.6 million to Hopkins since 1926 and who made possible the Jacob and Hilda Blaustein Pain Treatment Center; Henry J. Knott and his family, who have given an estimated $25 million to Hopkins medicine over the years; Mr. and Mrs. Ira



Denton A. Cooley

Belfer, whose gift in memory of their son—once a "blue baby" treated by Helen Taussig, M.D.—made possible the Peter Belfer Laboratory for Myocardial Research; John Duberg, Navy captain and retired banker, who gave approximately $3.5 million primarily for the Department of Urology, saying he owes his life to Hopkins; Constance D. Bendann, who continues her parents' generosity and commitment to the Wilmer Ophthalmological Institute; the late Eugene Meyer, III (M.D.-1941), whose bequest endowed the first Hopkins professorship in psychiatry and medicine; Harvey M. Meyerhoff and his late wife Lyn, who have given $3.75 million to establish the Meyerhoff Center for Digestive Diseases; Leonard and Ann Greif, whose most recent gift of $1 million will help make possible the new Ambulatory Care Center; Caroline Pennington, a 1918 graduate of the Johns Hopkins Hospital Training School for Nurses, who granted $1 million to endow the Elsie Lawler Chair in the School of Nursing; Denton A. Cooley, who has given $900,000 to the School of Medicine and to the Denton A. Cooley Athletic Center; and Virginia D. Haller, whose many gifts include a $1 million bequest for the Haller Chair in Pediatric Neurology.

As we celebrate the Centennial of Hopkins Medicine, we salute these men and women and the many others who through their generosity and wisdom have given the world a resource for humanity.

Trustee Panel Launches Wide Search for President

A search committee, named in April, has launched a wide-open international search for the next president of Johns Hopkins University.

"Our intention is to advertise the position widely," says Morris Offit, vice chair of the trustees and chair of the search committee. Korn/Ferry International, one of the largest management consulting firms, is also searching for candidates across the nation as well as in Europe, Offit says.

The committee is developing a profile of the qualifications for the next president, including an assessment of the needs of the university over the next five to ten years. The candidate will replace Steven Muller, who has held the position since February 1972; only Hopkins's first president, Daniel Coit Gilman, had a longer tenure. Muller announced in February that he intends to leave the presidency on June 30, 1990 *(Dateline Hopkins, April)*.

The committee is composed of ten trustees, two faculty members, and a student. The inclusion of a student—Louis Giangiulo, a junior who is president of the Homewood undergraduate student council—represents a new practice, prompted in part by students' protest over their lack of involvement in preparing the university's five-year financial plan. Says Giangiulo, "I want to be the sounding board for a major constituency—the students."

The trustees on the committee are H. Furlong Baldwin, Andre Brewster, Alan Hoblitzell, and Anne Pinkard, all of Baltimore; Michael Bloomberg and Frank Savage, both of New York; Victor Dankis of Warren, New Jersey; and Stephanie Weissman of Washington, D.C. The faculty members are James Walker, chair of physics and astronomy; and Richard Johns, chair of biomedical engineering.

Offit says the committee is open to suggestions from alumni, who may write to him at Room 240, Garland Hall, JHU, Baltimore 21218. —LAVINIA EDMUNDS

HIGHLIGHTS

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Crew Heads for Henley

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Plans for a Needle-Exchange Study Run Into Opposition

Hopkins researchers want to launch a study on a clean-needle exchange program to learn whether it can curb the growing rate of AIDS in intravenous drug users. At a Washington symposium in April, Baltimore Mayor Kurt Schmoke went a step further, advocating a national clean-needle program. That unleashed opposition—even to a Baltimore-based study—at the highest levels.

Needle exchange programs, which are common in Europe, offer addicts clean needles in exchange for their old ones.

Sorensen: *"We see a clean-needle program as a possible way to reduce the spread of AIDS."*



President Bush opposes the idea "under any circumstances," according to Health and Human Services Secretary Louis Sullivan, mainly on grounds that giving out syringes could encourage addiction. In Maryland the program would appear to violate a law on illegal paraphenalia.

Andrew Sorensen, executive director of the university's AIDS Institute, is working to get a waiver from the law. Earlier efforts to gain Governor William Donald Schaefer's support for a study failed.

Opposition to the study rankles Sorensen. "A person who is HIV-infected is more likely to die of AIDS than the deleterious effects of drug use," he says. "We see a clean-needle program as a possible way to reduce the spread of AIDS."

AIDS is spreading at a faster rate among IV drug users than any other group. According to David Vlahos, assistant professor of epidemiology, the incidence of AIDS among IV drug users increased by 6.5 percent last year, while it has slowed among male homosexuals. "There is already a baseline prevalence of AIDS—one in every four IV drug users," Vlahos says. "So something needs to be done."

Before plunging into a national program, Sorensen and Vlahos want to evaluate the efficacy of needle exchanges among a group of about 100. Studies in Amsterdam have shown a 30 percent reduction in AIDS from a clean-needle program, but the addict population is not necessarily comparable to those here.

Needle exchange programs have already begun in several American cities. But the proposed one in Baltimore would be the first to have a university's control and objective evaluation.

While advocating the clean needle program seems to dovetail with Schmoke's controversial proposal to decriminalize drugs, Sorensen stresses that the issues are separate. At the same time, he points out some ambiguities in the government's opposition. The most widespread federally funded drug treatment program is methadone maintenance. "It would seem that [underlying the methadone program is the

admission] that not all addicts will cut their appetite for addictive drugs." A needle exchange simply admits that not all addicts will quit because of educational efforts, Sorensen says.

In late spring, Sorensen was meeting with Baltimore community groups and discussing the project with officials from the National Institutes of Health. He says the official go-ahead for the evaluation study could come at any moment—or never. "Mayor Schmoke and I are out there alone," Sorensen says. "But I've been working against substantial odds before, and I'll fight this as long as it takes." —LE

Villa Spellman Rescued From Italian Tax Imbroglio

A typical fight with the Internal Revenue Service pales beside the byzantine struggle between Hopkins officials and Italian tax authorities about Villa Spellman, the university's graduate research institute



From the Patapsco to the Thames

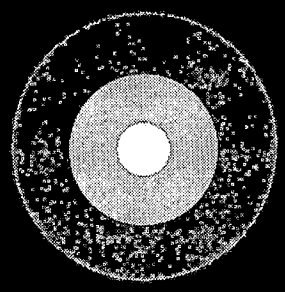
Members of the Hopkins crew will don straw boater hats for the 150th Henley Royal Regatta, at Henley-on-Thames June 28-July 2. After raising funds to support themselves, the crew this year gained varsity status. It's grown from a fledgling few in 1982 to 42 members. The four seniors who will represent Hopkins at Henley are (above, from left) Jonathan Hubbard, John Faulkingham, Evan Reiter, William Carlucci, and Jodi Kefer. "We're not going to win by a long shot," predicts team captain Hubbard, who angled for the invitation. He just wants to be there. "It's a very prestigious regatta, the oldest in the world."

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in Florence for Italian studies.

The first notice of problems came last summer when the uniformed Guardia di Finanza, the Italian financial police, knocked on the door of Villa Spellman and demanded its financial records for the past five years. Next came criminal charges against five Hopkins history professors and civil claims of back taxes amounting to about $100,000.

In late April, Hopkins officials received word via fax machine that the matter was resolved when the Italian government passed a decree classifying university programs in Florence as nonprofit enterprises.

The charges had baffled Hopkins administrators. No new law had been passed; an old one had been reinterpreted, classifying foreign schools in Florence as profit-making enterprises and their tuition income as taxable. The government was knocking on the doors of 10 Canadian and American schools with programs in Florence, claiming millions of dollars of back taxes.

Villa Spellman, as director Elizabeth Cropper pointed out, isn't comparable to insitutions such as Syracuse's Florence center, which has hundreds of undergraduates paying tuition. As a research center, Villa Spellman serves five to six graduate students each year, and Hopkins pays their way through fellowships and stipends.

Cropper and associate provost Stephen McLain worked for a year to resolve the problem, even holding a private meeting in Florence with a judge in the case and lobbying for a law clarifying the matter.

McLain was more than relieved when the decree was passed. "It's a bureacracy at work, and we got caught in the middle. Now we're out from under it." —LE

WJHU Drops Staff, Programs As Funds Keep Dwindling

Cutbacks in federal funds coupled with reduced university subsidies have forced WJHU, the university-licensed public radio station, to make further cuts in staff and programming.

continued on page 116.

THE ROUSE COMPANY

Columbia, Maryland

Hopkins People

■ **Richard Beigel, Nicholas Jones, and Craig Montell** have been given Presidential Young Investigator Awards. Beigel studies complexity theory in computer programming, Jones earthquakes, and Montell the molecular genetics of the fruit fly.

■ **William Evitts,** director of alumni relations, has resigned to pursue other interests. During his six years as director, many new programs have been started, including the Alumni Council and the Alumni Career Network.

■ **Stephen McLain** has been promoted from associate provost to vice provost for academic planning and budget. Among his new duties: overseeing the coordination of the five-year financial plan.

■ **James McPherson,** who got his Hopkins PhD in history in 1963, won the Pulitzer Prize for his book *Battle Cry of Freedom: The Civil War Era.*

■ **Paul H. Nitze** has done just about everything at the Hopkins School of Advanced International Studies, in Washington. With Christian Herter in 1942, he founded the school; he has funded it, offering a $5 million match grant to repay the school's building debts; he has been chair of its advisory committee; and in his retirement, he plans to teach at SAIS. Meanwhile, he has pursued an extraordinary public career as adviser to presidents, primarily in arms control. In his honor, SAIS became the Paul H. Nitze School of Advanced International Studies.

■ **Stephen Prutsman,** a student of Leon Fleisher at Peabody, won the fifth Biennial Beethoven Fellowship Piano Competition in March. As one of three first-place winners, Prutsman receives a three-year fellowship, entry in a major competition abroad, up to 30 recital or concerto engagements, plus $10,000.

The Johns Hopkins University

A Request to Alumni and Friends of Johns Hopkins

From the Chairman of the Presidential Search Committee

As you know, Dr. Steven Muller has announced his intention to retire from the presidency on June 30, 1990, concluding what will have been 18 superb and distinguished years of service to Johns Hopkins.

The Board of Trustees has begun a national and international search to identify his successor. We would appreciate your consideration and assistance.

Because of your close association with Johns Hopkins you are aware of its history, its relatively small size and its devotion to teaching, research and public service. You are aware of its highly decentralized management, its broad geographic diversity and its commitment to innovation and international outreach.

We would be pleased to hear from you about two key aspects of our search.

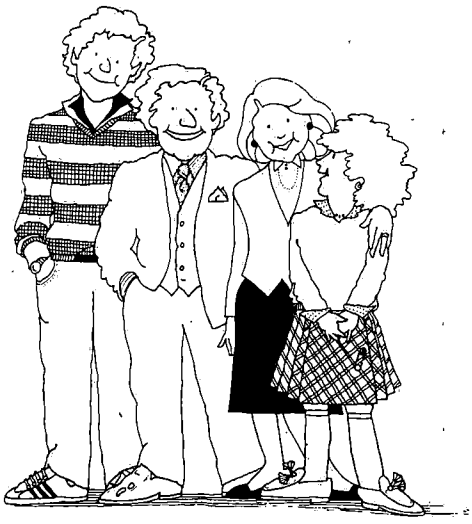
Keeping in mind the nature of Johns Hopkins today, what personal qualities and experience do you believe the University's next president should have? Do you have someone to recommend?

If you care to get in touch with us, please write to me at Room 240 Garland Hall, The Johns Hopkins University, Baltimore, Maryland 21218.

Thank you for your continuing interest in and support of Johns Hopkins.

Morris W. Offit, BA '57
Vice Chairman
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JOHNS HOPKINS

General manager David Creagh announced in May the elimination of the station's nightly jazz programming, suspension of its bimonthly magazine and program guide, and layoffs of four full-time staff members. That reduces the news staff to one.

Under the five-year financial plan approved in February, the university will trim its support of the station from about $600,000 in 1989 to $200,000 by 1993. The Corporation for Public Broadcasting, which bases its contribution on the amount the station receives from other sources, will reduce the station's income by $300,000 beginning July 1.

Creagh had hoped to locate other means of support. One plan was to sell the prize-winning station to the state's public broadcasting commission to be the flagship in a network of nine Maryland public radio stations. So far the state legislature has not backed the proposal. —LE

Murderer of Student Sought; Fellowship Established

As police worked to establish leads in the murder of Bridget Phillips, a 22-year-old history graduate student, the university established a fellowship in her memory. Phillips, a University of Florida graduate who had studied at Cambridge, had been on full fellowship in early medieval Byzantine history at Homewood since last fall.

She was found dead in her Calvert Street apartment March 23 with a wound to her head apparently caused by an blunt object such as a lead pipe. There was no evidence of theft or ransacking. The university has offered a $5,000 reward for information leading to the arrest and conviction of the killer.

"She was exhilarated by the sheer zest of living and welcomed every new intellectual challenge," said A.J. Russell-Wood, chair of the history department. "Part of the tragedy here is very few people enter the field."

Phillipps, who had mastered three languages, was what Russell-Wood called a "dawn-to-dusk" scholar with great promise. So far, about $8,000 has been contributed toward the Bridget Bernadette Phillips Memorial Fellowship in Byzantine and Early Medieval Studies, to go to an entering graduate student. —MICHAEL BOWMAN

HOPKINS Alumni

Compiled by John C. Schmidt

29 **W. Browning Betts** is retired and lives in Hollister, Calif. "Eighty-two years old," he writes. "My cup almost runneth over."

Sol Danoff is retired and living in Baltimore.

G. Duncan Johnson, PhD '34, of Macon, Ga., retired from Exxon in 1960 and from Wesleyan College in 1969. He writes: "I hope to attend the XXVIII International Geological Congress in Washington in July. There will be special recognition for those who attended the XVI Congress in 1933, as I did under the aegis of Professor J.T. Singewald."

Myron L. Kenler, MD Maryland '33, retired from medical practice in 1966 and lives in Lauderhill, Fla. Early in his career he was chief surgeon for the Pacific Division of Pan American Airways and helped establish trans-Pacific air service to China.

Philip W. Ness divides his time between homes in Osterville, Mass., and Sarasota, Fla. During his career he was chairman of the boards of Alexander & Alexander Services and Robert Fleming, Inc., and a director of General Signal Corp. and Western Maryland Railway Co."

Lloyd E. Root is retired and living in Bellevue, Wash. "My wife, Elta, and I enjoy good health," he writes. "We celebrated part of my 80th year by driving 12,000 miles from Washington state to Maine." The trip back included major cities on the East and Gulf Coasts as well as San Jose, Calif., for his granddaughter's wedding.

Richard H. Todd, MD '33, retired from medical practice and lives in Washington.

Michael J. Wieciech, MD Maryland '33, of Baltimore, has been retired since 1981.

34 **Frank Chandler** is a semi-retired general agent at Berkshire Life Insurance Co. in Lutherville, Md. He taught in Hopkins's evening division for 20 years.

William H. Kaufman, MD Duke Univ. '37, MS Virginia '47, is retired and living in Sparks, Md.

Wilbur J. Reitze, of Cockeysville, Md., is retired.

Irving Shelton is chairman of the board and chief executive officer of Physicians Postgraduate Press, Inc., in Memphis, Tenn.

William F. Stark, MSE '47, reports that he retired in 1987 from a second career as program coordinator for mechanical engineering technology at Metropolitan State College in Denver. In 1977, he retired as manager of engineering services for IBM in Boulder, Colo.

Oscar Sugar, MD George Washington Univ. '42, PhD Univ. of Chicago '40, is clinical professor in the Division of Neurosurgery at the University of California at San Diego. Previously he was professor and head of neurosurgery at the University of Illinois Abraham Lincoln School of Medicine.

35 **Joseph W. Farrell,** of Baltimore, reports that he retired in 1980 after 40 years in government with the Internal Revenue Service, Labor Department, and Health Care Finance Department.

37 **Lorman Hoopes,** MD Maryland '41, retired at the end of 1988 after 19 years with the Veterans Administration. He is now in private practice in Miles City, Mont. "Yes," he writes, "I make house calls."

38 **Maurice William Zucker,** MA '40, PhD Harvard Univ. '51, Meshulam Riklis Professor Emeritus of Creative Management at the Wharton School of the University of Pennsylvania, has been appointed visiting professor at the Columbia University Graduate School of Business.

39 **Malcolm Boshnack,** MD New York Med. Col. '43, is a retired otolaryngologist living in Miami.

Donald Hamilton Jr. retired in 1983 as chairman of the board of American Guaranty Corporation. He is interested in yachting and fishing and divides his time between southern California and La Paz, Mexico.

C. Leonard Krakauer, of Roslyn Heights, N.Y., retired in 1986. He was vice president and treasurer of Kay Springs, Inc.

Norman C. Melvin, LLB Harvard Univ. '42, is retired and living in Baltimore.

Paul W. Reigner, BD Union Theological Sem. '43, MT Princeton Theological Sem. '48, of Winter Haven, Fla., is retired.

Daniel J. Stone, MD George Washington Univ. '43, is professor of medicine at New York Medical College and medical director of a recently established Sleep Breathing Disorder Center at the college. His work at the center was the subject of an article in *The New York Times* last September.

Morris A. Wessel, MD Yale Univ. '43, practices pediatrics in New Haven, Conn., and teaches at the Yale University Medical School. He recently published *Parents Book on Raising a Healthy Child* (Ballantine Press).

44 **Walter H. Bramman** retired last year as president and chief executive officer of a manufacturers representative and sales consulting firm in Timonium, Md.

Richard B. Kurtz, BS Maryland '50, of Raleigh, N.C., is retired. He was process engineer with Energy Development Associates in Greensboro, N.C.

William S. Warner is a financial consultant with Shearson Lehman Hutton, Inc., in Baltimore.

Charles W. Wilhide retired in 1983 as chief engineer with the Engine Products Division of Dana Corp. in Richmond, Va. He now lives in New Bern, N.C.

1947 MD: Wood S. Herren retired in March as medical director for South Central Bell after 21 years with the company. He was on the staffs of several Birmingham hospitals and was associate professor of clinical medicine at the University of Alabama at Birmingham.

49 **Samuel Ansel,** of Randallstown, Md., retired as a teacher and guidance counselor with the Baltimore City Board of Education.

Max Bodenheimer is president of Day/Speedy Printing, Inc., which he established in Baltimore in 1980.

D. Henry Edel, MME Clarkson Univ. '62, is dean of degree programs at ITT Technical Institute in Portland, Ore. His wife, Willagene, is a 1953 School of Nursing graduate.

Joseph R. Gutberlet retired in 1986 as a program manager with Westinghouse in Baltimore.

Leonard C. Harber, MD New York Univ. '53, is professor and chairman of the Department of Dermatology at the Columbia-Presbyterian Medical Center in New York.

Calvert K. Hartle retired last fall as senior staff engineer with Martin Marietta Missile Systems in Orlando, Fla., after 34 years with the company.

Thomas F. Herbert, MD Maryland '53, is a physician in Ellicott City, Md.

Harry L. Holman retired in 1985 as manager of contracted operations for the Textile Fibers Department of the Du Pont Company in Wilmington, Del. He now lives at Seabrook Island, Johns Island, S.C.

"I've practiced pediatrics for 30 years in St. Louis, hard as that is for me to believe at times," writes **Henry L. Knock,** MD '53. "I plan to keep practicing as long as I can make enough to pay the overhead."

Norman Lowe, MD '53, practices pathology and laboratory medicine in Fort Madison, Iowa.

Leroy H. Smith Jr., DrEng '54, is manager of turbomachinery aerodynamics technology for General Electric in Cincinnati. He has won a number of awards field and last year was elected to the National Academy of Engineering.

Edward B. Stubbs is a project manager at Veda Incorporated in Arlington, Va.

"I am in my 30th year of family practice in Jarrettsville, Md.," writes **James F. White Jr.,** MD Virginia '58. "We live on a 14-acre farm where we raise beef steers and field crops."

George P. Yucius is director of energy services for the Orlando Utilities Commission in Orlando, Fla.

52 **Rexford R. Gile Jr.** retired as an environmental engineer with the U.S. Environmental Protection Agency in January and has moved to Surfside Beach, S.C.

53 **Nicholas G. Byron,** JD Washington Univ. 58, was recently appointed Circuit Judge by the Illinois Supreme Court and is currently assigned to the Law Division in Edwardsville, Ill.

1955 MD: James Thomas Wheeler, clinical professor of internal medicine at Southwestern Medical Center and medical director of the Dallas Blood Center, has been appointed to serve on the community advisory panel on the incidence of HIV positivity in Dallas County.

59 **Richard P. Auffarth** is an insurance agent in Timonium, Md. He is active in the Timonium Presbyterian Church and a member of the board of trustees of Role Model, Inc.

Millard F. Beatty, PhD '64, is professor of engineering mechanics at the University of Kentucky. He is the author of numerous technical papers and of the textbook, *Principles of Engineering Mechanics.*

Larry K. Haines, MA '62, PhD Maryland '66, is president of Jaeger & Haines, Inc., in Fayetteville, Ark.

Jed J. Jacobson, MD Emory Univ. '62, writes from Hollywood, Fla.: "Back at the same store for the past 21 years practicing pediatrics and vicariously reliving my college years with two of my three sons presently in college—one at Hopkins and one at MIT."

Guy B. Maseritz, MA '61, LLB Maryland '66, of Columbia, Md., specializes in business law and estate planning. He also teaches law and economics in the MAS program at Johns Hopkins. "My son, **Mike,** graduated in May with a BA and my daughter, **Margi,** graduated in 1988 with a BA," he writes.

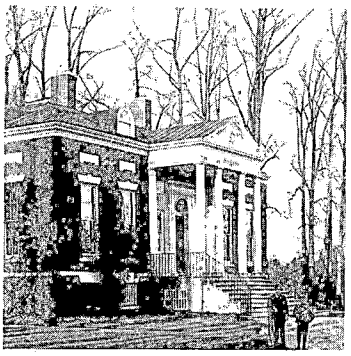
Bruce C. Mitchell works in acoustic image collection and processing at the Westinghouse Oceanic Division in Annapolis, Md.

Bruce E. Moats Jr., ME Texas A&M Univ. '66, MS Univ. of Southern California '81, retired in 1988 as a colonel after 28 years with the Army Corps of Engineers. He is now pursuing a second career as plant director and assistant to the dean of administration at Southern Oregon State College in Ashland, Ore.

William Patterson Jr. is managing director of William Patterson LDA in Cartaxo, Portugal.

Class Notes *Please send your news to Alumni News, Johns Hopkins Magazine, Johns Hopkins University, Baltimore, MD 21218. The columns will run news from both graduate and undergraduate alumni, including jobs, babies, marriages, and other important personal news. When a degree is mentioned and no school is named, this is a Hopkins degree. Ground rules: No pregnancies or engagements, please. Items may be edited for space.*

HOMEWOOD



Courtesy Gilman School circa 1905

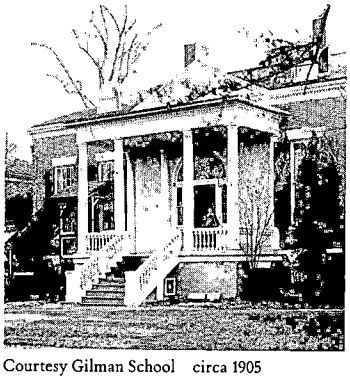
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Ralph D. Reymond, MA '63, MD Maryland '67, is medical director at Radiology and Nuclear Medicine, P.A., in Topeka, Kan. He is also clinical assistant professor in the Department of Radiation Therapy at Kansas State University Medical Center. He is the author of numerous publications and is preparing for publication his 10 years of experience in treating breast cancer with interstitial radiation.

Harvey J. Sugerman, MD Jefferson Med. Col. '66, is David M. Hume Professor of Surgery at the Medical College of Virginia in Richmond.

Frank M. Waldorf, rabbi at Temple Sinai in Brookline, Mass., in March was awarded an honorary Doctor of Divinity degree by Hebrew Union College to mark his 25 years of service in the Reform Rabbinate.

60 **Jack N. Alpert,** MD Tufts Univ. '64, is chief of the Department of Neurology at St. Luke's Hospital in Houston and clinical associate professor at the University of Texas.

61 **Julia Gooden Bolton** has been promoted from assistant vice president to vice president for nursing at the Southwestern Vermont Medical Center in Bennington.

63 **Thomas H. Benton** recently joined The LINC Group, Inc., as senior vice president of marketing in the firm's Chicago headquarters. Formerly, he was senior vice president for Financial Investments Associates, a lessor of hospital equipment based in Illinois. LINC provides equipment leasing and financial services for health care .

65 **P. Thomas May Jr.** has been promoted to president of First Virginia Mortgage Company, an affiliate of First Virginia Banks, Inc., which he has been with since 1969 and most recently served as the affiliate's executive vice president and chief operations officer. He and his wife, Mary Ann, and their two children live in Fairfax, Va.

Ferdinand C. Provini is vice president of transportation/structures in the West Palm Beach, Fla., office of the engineering firm of Greenhorne & O'Mara, Inc. He has been with the firm for 17 years, formeryly at its Greenbelt, Md., headquarters. He has been involved in more than 50 highway projects throughout the U.S.

1966 MAT: Marcus J. Saegrove, PhD Iowa State Univ. '71, MS Wisconsin '83, in February was promoted to full professor in the Department of Mathematics/Computer Science at Viterbo College in LaCrosse, Wisc.

67 **William T. Potts** recently opened East Meets West, Ltd., a business featuring ethnographic art, in Pittsford, Vt. An archaeologist, he specializes in the sale of the art of non-industrialized cultures. "Artifacts are interesting, but they belong in museums," he says. "I take pride in carrying a broad range of contemporary art that is affordable to the average collector."

1967 MLA: John A. Micklos, a teacher in the Baltimore County school system for the past 25 years, in February was appointed by the governor of Maryland to the board of regents of Morgan State University.

1968 PhD: Richard I. Hires, professor of ocean engineering at Stevens Institute of Technology in Hoboken, N.J., was recently appointed head of the Department of Civil and Ocean Engineering. He has been on the institute faculty since 1967.

69 **Peter Benson,** PhD California '74, is section head at ITT Defense Communications Division in San Diego. "The kids are away at college—Berkeley and Santa Cruz," he writes. "I am pursuing a career in cognitive science, specializing in speech recognition. I am active—running, cycling, hiking—but an interest in cooking keeps me burly."

Dennis J. Gray, MSE Pennsylvania '74, is vice president of the KMS Group, Inc., in Columbia, Md.

Dennis Massey, MA '75, PhD Univ. of Cincinnati '85, writes: "I recently assumed duties as associate dean at the Lewis & Clark College of Arts and Sciences in Portland, Ore., after 12 years as dean of continuing studies at Wilmington College in Ohio. I have a forthcoming book by Greenwood Press on the Amercan prison novel. My wife, two sons, and I are enjoying the Oregon mountains after years in a corn field."

Kenneth P. Niman, JD George Washington Univ. '72, has been named chairman of the litigation department of the firm of Kaplan, Heyman, Greenberg, Engelman & Belgrad in Baltimore. He has been with the firm since 1972.

J. William Pitts, MD Med. Univ. of South Carolina '73, is a physician in Columbia, S.C.

William R. Whalen, MD Harvard Univ. '74, practices medicine in Denver.

71 **William Jay Bryan,** team physician for the Houston Astros, recently joined other American orthopedists and physical therapists in launching a sports medicine program in Guatemala. A specialist in joint implant surgery, he received his medical degree from Baylor College of Medicine.

1971 MEd: Bobbie Fine Cotton, MS '77, JD Univ. of Baltimore '83, practices law in Ellicott City, Md., and produces Legal Line, a Howard County cable television show. She was married last August to Charles S. Cotton, an evaluator with the General Accounting Office in Washington.

72 San Francisco banker **Craig Wolfson,** JD Florida '75, reports that he is still a ardent traveler to exotic places, having spent March in Thailand trekking in the northern mountainous areas inhabited by hill tribes.

74 **Robert Barbera,** PhD '78, is executive vice president and chief economist at Shearson Lehman Hutton in New York.

Stuart Cole, JD Boston Col. '77, is assistant attorney general in the Ohio Attorney General's Office in Columbus.

Maj. James J. De Carlo is an intelligence officer with the U.S. Army at Eglin Air Force Base in Florida.

Shirley Dilsworth, JD American Univ. '77, LLM Georgetown Univ. '83, has been promoted to director of employee relations in the Employee Benefits Group of CIGNA Corporation in Bloomfield, Conn. She joined the firm in Philadelphia in 1986.

Joel Feinberg, JD New York Univ. '78, is a partner in a Boston law firm. His wife, **Marty,** MPH '80, is a cardiology social worker in Children's Hospital in Boston.

Actor **Dennis Gagomiros** reports that he recently completed a successful run as Lee in Sam Shepard's *True West* at the Shadowland Theater in Ellenville, N.Y.

Stanley L. Lin, PhD '82, is principal scientist at the Schering Corporation in Bloomfield, N.J. His wife, **Jane,** PhD '80, is senior toxicologist at CIBA-Geigy Corp. in Farmington, Conn. They have two children and live in Chestnut Ridge, N.Y.

Samuel I. Miller, MD Baylor Col. of Med. '79, is assistant professor of medicine at Harvard University/Massachusetts General Hospital in Boston.

Raymond J. Peroutka Jr., MBA Loyola Col. '78, JD Univ. of Baltimore '82, is president of Maryland First Financial in Baltimore.

William E. Rankin is chief investment officer-international at Prudential Insurance Co. of America in Newark, N.J. He is a graduate of the University of Pennsylvania's Wharton School and is married to the former **Marlene Kidda,** MS '74, PhD Texas Women's Univ. '84.

"I have been on the staff of the Mayo Clinic for three years, now in the Division of Thoracic Diseases and Internal Medicine," writes **Jay H. Ryu,** MD '78. "I am also assistant professor of medicine at the Mayo Medical School and last year received a Teacher of the Year award from the medical residents and fellows. Patricia and I had our first child, Alexander, last September 21."

John Shepard, JD Maine '80, practices law in Freeport, Maine.

Bauer Sumpio, MD Cornell Univ. '80, PhD Cornell Univ. '81, practices general and vascular surgery in New Haven, Conn., and is chief of vascular surgery at the West Haven VA Medical Center.

"The birth of our first child, Enrique, last October is the most exciting thing to happen to me recently," writes **Susan M. Steingass,** MBA Univ. of Rochester '75. "Although I'm enjoying motherhood tremendously, I will be returning to work." She is a vice president at Citibank in New York.

Victor Gerald Vogel, MD Temple Univ. '78, MHS '86, is assistant professor of medicine and epidemiology at the University of Texas M.D. Anderson Cancer Center in Houston.

1974 PhD: Lewis Pyenson, professor of history at the University of Montreal, has been awarded an Izaak Walton

Killam Senior Fellowship by the Canada Council of Arts for his contributions to historical research. He is the author of numerous works in the history of science, including *Empire of Reason: Exact Sciences in Indonesia, 1840-1940* (1989). He is also curator of the Osler Library for the History of Medicine at McGill University.

1975 PhD: Henry S. Sussman, professor of comparative literature at the State University of New York at Buffalo, has been appointed to a second three-year term as director of the program in comparative literature at the university. A member of the faculty at Buffalo since 1978, he was recently elected to the Johns Hopkins Society of Scholars.

76 Virginia Donovan, MD 81, is associate pathologist at Winthrop University Hospital in Mineola, N.Y., and clinical assistant pathologist at Cornell University School of Medicine. She was married last year to Thomas Eyerman, an analytical engineer.

Terri Di Pasquale, JD Maryland '81, recently joined the Palm Beach, Fla., law firm of Mettler & Gilson, practicing real estate and banking law. She was married in November to Ross C. Hering.

1976 MS: Anne Giroux is an audiologist in Winslow, Maine, where she supervises an infant hearing assessment program. She writes that she has four sons, ranging in age from five to 12.

1976 MSE: L. David Naman, a consulting engineer in Houston, and Anne Aresty Naman report the birth of a son, Daniel Bernard, last September.

77 John Finston recently became a partner in the Washington office of the law firm of LeBoeuf, Lamb, Leiby & MacRae. He and his wife, the former **Lynne C. Robertson** '77, live with their two-year-old daughter in Potomac, Md.

Peter Koenig and his wife, Edie, had their second child, Edgar Joseph, on March 9. Their first son, Mathias Peter, is two years old. They are residents of Long Branch, N.J.

Brian E. Mondell, MD New York Univ. '81, recently opened the Baltimore Headache Institute, which takes a multidisciplinary approach to headache management.

78 Jerome James LaCorte, JD Maryland '82, former assistant public defender in Caroline County, Md., now practices law with a firm in Ocean City, Md., where he specializes in criminal law and bankruptcy.

"Since leaving Hopkins roughly 10 years ago, I've been working in the oil and gas industry in the Rockies and the Southwest," writes **Rick Nelson.** "I presently work for Sun Exploration & Production in Dallas. I am married with a five-year-old daughter and a one-year-old son."

Joseph J. Siemek, MBA Loyola Col. '88, is chief financial officer for Riemer Muegge & Associates in Ellicott City, Md.

1978 MS: Dan W. Hamlin was recently named national practice director for grant and contract advisory services at KPMG Peat Marwick in Washington. He specializes in service to non-profit organizations.

79 Michael H. Bar, MD Columbia Univ. '83, is a research fellow in hematology/oncology at the Cancer Research Institute of the University of California at San Francisco.

A. Keith Blizzard, MBA Duke Univ. '84, is associated with the Marriott Corporation in Bethesda, Md.

Terri J. Frank, JD Fordham Univ. '82, is an attorney specializing in antitrust litigation with Texaco Inc in White Plains, N.Y. She is also counsel to the advertising, international aviation sales, and insurance departments.

Sheila McDonald Gill, JD Catholic Univ. '82, is associate general counsel at Rockland Industries in Baltimore.

Capt. Ferdinand Irizarry II was recently an observer-controller for the Army's Project Warrior at Fort Irwin, Calif. He and his wife, Karen, have a one-year-old son.

William Laufer, JD Northeastern Univ. '83, PhD Rutgers Univ.'86, is assistant professor in the Department of Criminal Justice at Temple University.

Jo Anne Siple Myers, MIM American Grad. Sch. of International Management '79, is manager of market research at Ralston Purina in St. Louis.

Eric D. Newman, MD Pennsylvania State Univ. '83, is an associate in the Department of Rheumatology at Geisinger Medical Center in Danville, Pa. "I've been happily married to Laurie for five years," he writes, "and we have a wonderful son, Nathaniel. Professionally, I'm busy teaching and am active in clinical research."

Christopher Prevas, MS '84, of Baltimore, is president of Prevas Engineering, Inc., an independent electronics consultant to the defense industry. He was married last August to Jill Creamer.

Steven J. Schoenfelder, MD Maryland '85, is completing residency in internal medicine and pediatrics at Geisinger Medical Center and plans to join Geisinger Medical Group in Milton, Pa. He and his wife, Susan, a staff physician at Geisinger Clinic, have a two-year-old son.

Seth Steinberg, PhD North Carolina '83, is acting head of the biostatistics and data management section at the National Cancer Institute in Bethesda, Md.

Fred Tolchinsky writes from Springfield, N.J.: "I received an MS from Yale in 1982 in systems and information science and was recently named director of marketing for the Metro Park and Princeton offices of Arthur Young & Co., an international accounting and consulting firm."

Ronald Jay Zagoria, MD Maryland '83, completed a residency and fellowship in radiology at Bowman Gray School of Medicine and joined the faculty there in 1987. He and his wife, **Kathy,** MEd '81, have two children and live in Winston-Salem, N.C.

1979 MA: Walter Glannon has been promoted to associate professor of Spanish and Portuguese at Smith College, where he has taught since 1983.

80 Capt. Teresa M. Buescher, MD '85, recently passed her general surgery boards and is now a staff general surgeon at the U.S. Army Burn Unit in San Antonio, Texas. She writes that she is looking forward to promotion to major in the near future.

81 Lauren Mardell Levrant, MA '81, and her husband, **Seth Levrant** '81, MD State Univ. of New York '86, had a daughter, Valerie, on March 4. They also have a three-year-old son, Peter.

David Nover, MD Rutgers Med. Sch. '85, recently completed a residency in psychiatry at the Institute of Living in Hartford, Conn., and is taking a position this summer as staff psychiatrist at the Delaware Valley Mental Health Foundation in Doylestown, Pa. He and his wife, Elizabeth, were married in 1984 and had a daughter, Amanda Felice, last May.

1982 MA (SAIS): Roman Lyniuk recently became senior chief dealer at Credit Suisse in New York.

1982 MPH: Lt. Cdr. Bonita D. Malit received an MD from the University of Florida and is now a U.S. Public Health Service officer at the Coast Guard Academy in New London, Conn. She married David Backman, a social worker, last July.

83 Kathleen A. Duke, JD Harvard Univ. 87, writes: "I recently received an offer to transfer to the Hong Kong office of Gibson, Dunn & Crutcher and it looked like a brass ring, so I grabbed it. Now I'm practicing international law, learning a little Cantonese, and eating a lot of Chinese food. I've met several JHU alumni out here and we're starting an alumni chapter. Now that I'm halfway around the world, it's nice to hear from friends back home. I can be reached at Gibson, Dunn & Crutcher, 17th Floor, Caxton House, 1 Duddell Street, Hong Kong."

1983 MSE: N. Adlai A. De Pano, PhD '87, is assistant professor in the computer science department at the University of New Orleans. He and his wife have a one-year-old daughter.

1983 MPH: Gary A. Smith, DrPH '88, recently returned from Sydney, Australia, where he was named one of 10 "Outstanding Young Persons of the World" by Jaycees International. A fellow in pediatric emergency medicine at Children's Mercy Hospital in Kansas City, Mo., he does research on childhood injuries and has worked as a volunteer in health projects in Mexico, Guatemala, and India.

84 Michael Abele, MHS '88, is an MD candidate at the University of Medicine and Dentistry of New Jersey.

Gregory T. Almony, MD New York Univ. '88, is a resident in internal medicine at the University of Michigan Medical Center in Ann Arbor.

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Steven Bialek, PhD California '89, is a graduate assistant in biophysics at the University of California at Berkeley.

Miriam Bloom, MD Northwestern Univ. '88, is a resident in pediatrics at Cincinnati Children's Hospital.

Suzanne Conklin is completing work on a master's degree in in the English and comparative literature department at Columbia University.

Rebecca Toussaint Einolf, MBA Florida State Univ. '86, studied international banking in West Germany on a Fulbright scholarship and is now a credit analyst in the Chicago branch of Credit Lyonnais Bank. Her husband, **David** '81, MS Delaware '84, is a project manager for ARCH Development Corporation.

Suzanne M. Holmes is a systems engineer at Electronic Data Systems Corp. in Lakewod, Calif., and is working toward an MBA degree at the University of Southern California in Los Angeles. She is married to **J. Scott Holmes** '84, JD Harvard Univ. '87, an associate in the Los Angeles law firm of Sullivan & Cromwell.

Susan L. Kaplan, editorial production layout artist for *The New England Journal of Medicine*, writes: "After a brief foray into advertising, I have been in the field of publishing in Boston since graduation, and I've experimented with different facets of the industry from editorial to production." She has been married for a year to **Bradley Barazani** '84, MBA Michigan '86, budget and controls analyst at Boston Edison Company.

Steven Kasten, MA '85 (SAIS), is a first-year law student at the University of Michigan. He writes: "After working two and a half years as an international economist at Merrill Lynch in New York, I decided to become a lawyer. So here I am back in school."

Carol Lefkowitz writes: "I am currently working as a real estate salesperson with Grubb & Ellis Company, selling and leasing industrial warehouse and manufacturing space in the Los Angeles area."

Nicholas Letica and **Terri Glubin Letica** '84, JD Maryland '87, of New York, report the birth of a baby girl, Jamie Shanna, on April 22, 1988.

Anna Lueje writes from Ann Arbor, Mich.: "After graduation I went to work for the State Department in Washington where I met my husband, D. Mark Blanchard, a foreign service officer. We were married in July 1986 and were both posted to the U.S. Embassy in Rome. I left the State Department in May of last year and am currently a law student at the University of Michigan."

Robert G. Morrison is a biomedical fellow and PhD candidate at Rockefeller University and is working toward an MD degree from Cornell University.

William H. Owens, JD Maryland '88, practices law in Baltimore.

George D. Pillari is president of Health Care Investment Analysts, Inc., in Baltimore.

Stuart Pollack graduated from the University of Maryland Medical School and is now a resident in internal medicine at Barnes Hospital/Washington University. In 1987, he married **Lisa Bladen** '85, MAT Brown Univ. '86, who is studying law at St. Louis University Law School.

Kenneth S. Reuwer, BA Virginia Polytechnic Inst. '87, is a special agent with the Department of Defense in Washington. He and his wife, Michelle, live in Deale, Md.

Li-Hsien Rin-Laures, MD Northwestern Univ. '88, plans a career in patent law and will enter Harvard Law School in the fall.

Rhonda Y. Robinson writes: "I worked for three years as a chemical engineer for the Navy Department and also attended Virginia Tech for a master's degree in environmental engineering. I left engineering a year ago to pursue something I truly loved, acting. I attended the American Academy of Dramatic Arts in New York and am now auditioning in the Baltimore-Washington area."

Carolyn Schurr, JD Univ. of Chicago '87, is an attorney with the firm of Corbin Silverman & Sanseverino in New York.

P. Olen Snider Jr., JD Wyoming '87, is an associate attorney in the Baltimore law firm of Shapiro and Olander.

Andrew M. Wahl is president of Computers & Programs, Inc., in Chesterfield, Mo. His wife, **Melissa** '86, teaches French and Latin at the Rossman School in St. Louis.

Eugene Yeh, ME Case Western Reserve Univ. '88, is a technician at the University of California at Los Angeles.

85 **Stuart W. Cobb,** JD Kentucky '88, has joined the law firm of Kahn, Dees, Donovan and Kahn in Evansville, Ind.

1985 MS: Nancy Brown Toms, of Charlottesville, Va., announces the birth of her second child, Elizabeth Wilton, on February 26.

1985 MAS: Stephen Push has been promoted to vice president in the Biotechnology Group of Hill and Knowlton, Inc., in Washington. Prior to joining the firm in 1986, he was a medical writer, associate director of public affairs at the Johns Hopkins Medical Institutions, and a senior associate in another public relations firm in Washington.

1985 MPH: Doris Y. Wilkinson, PhD Case Western Reserve Univ. '86, is professor of sociology and director of medical history research at the University of Kentucky in Lexington. In 1988, she won the American Sociological Association's DuBois-Johnson-Frazier Award and also received a grant from the Kentucky Humanities Council and the National Endowment for the Humanities to study Afro-American physicians during the period 1890-1950.

86 **Michelle Onello** has returned to school and is working toward a law degree at Harvard University.

Jill Salzman, of Falls Church, Va., recently became training coordinator at the Sheraton Washington Hotel.

Edwin Ritchie Schell, of Baltimore, is a branch officer at First National Bank of Maryland working in the Small Business Development Group.

1986 MHS: Allen R. Schaeffer is an environmental specialist for the American Trucking Association in Alexandria, Va. He lives in New Windsor, Md., and also does consulting in environmental science and public health.

87 **Grace Chen** and **Douglas Vanesko** '86, MS '88, were married last June. Grace is a second-year medical student at the University of Texas in Dallas and Douglas is a computer engineer at Bell Helicopter in Fort Worth, Texas.

Susan Gorozdas and **Michael Ehrlich** '87 were married last June. Both are graduate students at Johns Hopkins.

Christopher Verica is assistant unit manager and program specialist at Elwyn, Inc., a handicapped care facility in Media, Pa. He writes that he recently spent two and a half months touring Europe by backpack.

1921: Emory S. Basford, a teacher and head of the English Department at the Phillips Academy in Andover, Mass., for more than three decades, died in Gaithersburg, Md., on March 1 at the age of 90. He retired in 1964 but maintained contact with many of his former students, who included President George Bush.

1923: Ferdinand G. Brickwedde, PhD '25, former professor of physics at Pennsylvania State University, died on March 29 in Bellefonte, Pa. While working at the National Bureau of Standards in 1931, he assisted in the discovery of deuterium, now used in making heavy water to cool nuclear reactors.

1927 MD: Ko Kuei Chen, a prominent pharmacologist who helped establish the Eli Lilly and Company Research Laboratories, died on December 12 in San Francisco. Born near Shanghai in 1898, he moved to Indianapolis in 1929 where he became the Lilly company's director of pharmacologic research and professor of pharmacology at the Indiana University School of Medicine.

1930: Isadore Tuerk, MD Maryland '34, mental health commissioner for Maryland from 1960 to 1968 and a pioneer in group therapy sessions for alcoholics, died in Baltimore on February 24. He was 81. In addition to a private practice in psychiatry, he taught for many years at the medical schools of Johns Hopkins and the University of Maryland. At the latter institution, a drug and alcohol abuse treatment center was named in his honor in 1970.

1932 MD: John S. Howe, a retired pathologist and authority on kidney disease, was killed in a plane crash on March 11 while vacationing in Peru. He retired in 1968, having held positions at Veterans Administration hospitals in Washington and Baltimore. During his career, he taught at the medical schools of Johns Hopkins, George Washington University, the Medical College of Virginia, and the University of Illinois.

1934: Anthony L. Cuomo, a retired metallurgist, died in Baltimore on March 25 at the age of 78. He had worked for

more than 40 years as chief metallurgist and foreman of the mill at the Sparrows Point plant of Bethlehem Steel Corp. before retiring in 1975. He was active in church and community work in Baltimore and coached the city's first professional soccer team.

1934: Lucille Tingle Masson, BM '34, MM '54, a long-time teacher of music, died on March 6. A graduate of both Johns Hopkins and Peabody Conservatory, she taught music in Baltimore schools for more than 40 years. She also taught music instruction at Peabody and had served as organist and choir director at several area churches.

1934 MD: Mark M. Ravitch, a prominent surgeon and professor of surgery at Johns Hopkins for many years, died in Pittsburgh on March 1 at the age of 78. He served as resident in surgery under Alfred Blalock and was surgical house officer at Johns Hopkins Hospital for nine years. He was the author or editor of 20 medical textbooks and became widely known for the introduction of mechanical surgical stapling devices in the United States. An endowed professorship in surgery was recently established at the School of Medicine in his honor.

1935: Sylvan Daniel Solarz died in Chicago last October 16 at age 74. While at Hopkins, he was associate editor of the 1935 *Hullabaloo*. He earned a medical degree at the University of Maryland and practiced in the Chicago area.

1937 MA: Evelyn Wingate Wenner, professor emeritus of English at Western Maryland College, died in Westminster, Md., on March 1. She taught Shakespeare and journalism at Western Maryland for more than 30 years before retiring in the early 1970s.

1939: Bertram C.H. Meyers, a former Baltimore Gas and Electric Company electrical engineer, died in Baltimore on April 3 at the age of 81. He retired in 1972 after 46 years with the company.

1942: Francis D. Friedlein, who served in a number of engineering, research, and management positions during his career, died in Durham, N.C., last November 25. After service with the War Production Board during World War II, he was associated with several private corporations until 1971, when he became a manager in the Howard County (Md.) Department of Public Works. He retired in 1975 and was made a lifetime member in the Maryland Section of the American Society of Civil Engineers.

1943: Charles W. Stewart Jr., MD Maryland '47, a retired physician and psychiatrist, died on March 5 at his home in Shady Side, Md. He was 66. He practiced in Maryland and Hawaii before joining the U.S. Food and Drug Administration in Washington as medical review officer. He retired in 1981.

1947: Vernon L. Dickson, former manager of corporate planning for the Koppers Co. in Pittsburgh, died on February 16 at his home in Tucson, Ariz. He joined the company in Baltimore upon his graduation and moved to Pittsburgh in 1976.

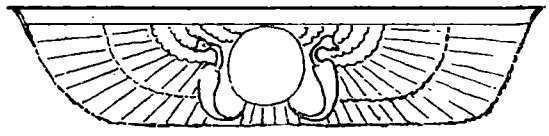
1948: Alexander L. Feild Jr., former manager of product engineering in the Nuclear Fuel Division at Westinghouse in Pittsburgh, died in Mt. Lebanon, Pa., on April 10. He had been retired since 1982.

1950: John A. Burns, former director of the Wayne, N.J., public library, died in Baltimore on March 8 at age 60. Earlier in his career he worked at the Enoch Pratt Free Library in Baltimore and was assistant director of the Anne Arundel County Library. He had also served as president of the Maryland and New Jersey library associations.

1964 PhD: Fred N. Huffman died at his home in Sudbury, Mass., on January 17. He was vice president of the Research and Development/New Business Division of Thermo Electron Corp. in Waltham, Mass., with which he had been associated for the past 22 years.

1970: Thomas P. Greene Jr., an engineer in the electrical transmission and distribution department of the Baltimore Gas and Electric Company, died on March 6 at the age of 54. A resident of Parkville, Md., he had been with the company for 37 years. He was a former president of the alumni of the Hopkins evening engineering program.

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tents on hand to accommodate the most desperately ill. Billings's intricate ventilation systems in the isolation ward called for air to pass over heating coils in the basement, rise through holes in the floor, and exit through the patient's private chimney. In this way, a large amount of air—about four cubic feet per second—was supplied to each patient. The air passed constantly upward; none of it was rebreathed.

Billings's steadfast adherence to the pavilion system created some practical problems. Superintendent Henry Hurd later wrote: "The whole structure was too much upon the line of the army hospital. It was deficient in modern facilities for nursing and in the modern laboratories for studying disease. The sink rooms, ward bathrooms, linen rooms, etc. were too small and not arranged for the convenience of nurses. They seemed to contemplate the presence of the army orderly at every turn. There was also imperfect provision for housekeeping and store rooms and other conveniences." Adding that these were minor defects, Hurd went on to say that Billings's plans gave "a tremendous impetus to better hospitals by directing the attention of medical men, sanitarians, and others to the absolute necessity of . . . the prevention of contagion."

WHATEVER THE SHORTCOMINGS OF Billings's design for the hospital, there was little to criticize in his plans for its organization and that of the medical school. It was Billings who best understood Johns Hopkins's wish that the hospital form a part of the medical school and the university, Billings who drew up guidelines connecting the hospital to the medical school.

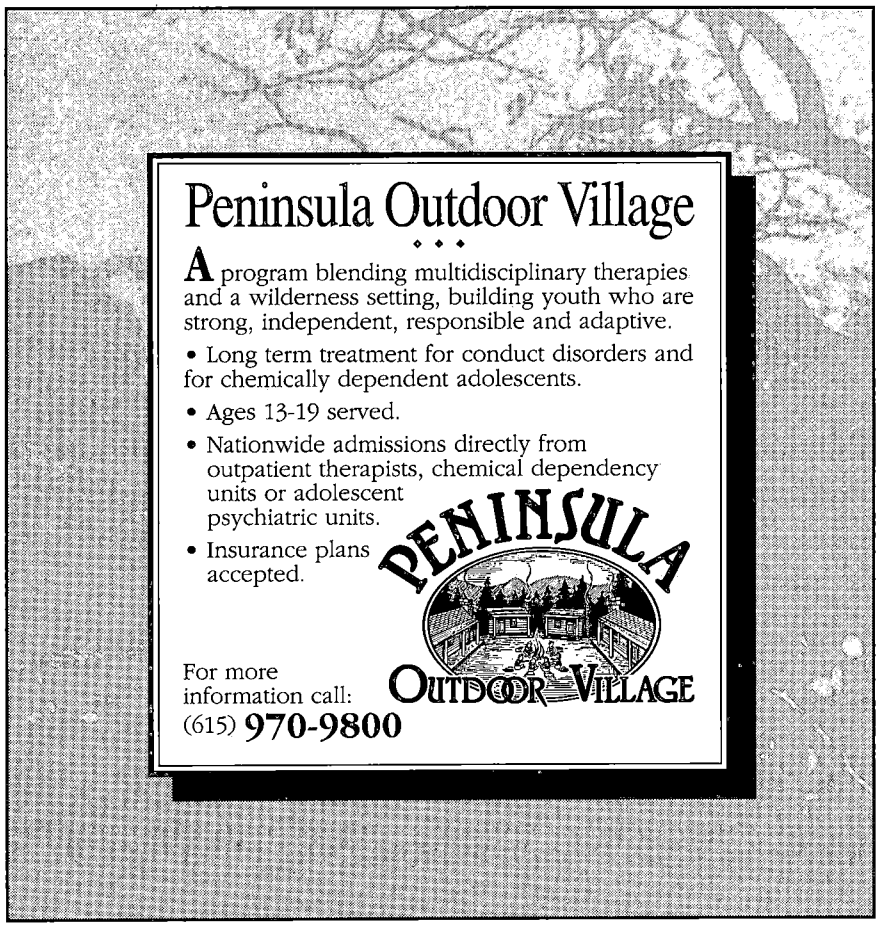
In a period when a three-year course of study was the standard, he pushed for four; when any high school graduate could enter medical school, Billings called for a baccalaureate degree or the equivalent of four years' undergraduate study. At a time when medical students were lucky to see the inside of a hospital, Billings's vision encompassed a medical school with a hospital as its clinical center. And when no university, college, or hospital in the United States was conducting systematic investigation in the sciences basic to medicine, Billings lobbied to make Hopkins a home of original medical research.

Like so many of his other ideas, Billings's respect for research had grown out of the war years. As executive director of the Army General Hospital in 1862, he had bought his first microscope and learned to use it under the tutelage of Joseph Leidy, later a famous anatomist and naturalist. During his early years in the surgeon general's office, Billings again tackled the study of microscopy and microphotography, which were just coming into fashion in America. Among his fellow officers was Joseph Janvier Woodward, one of the earliest experts in photomicrography. Later, Billings published original observations on minute fungi and diseases of cattle.

As planner of Hopkins, he provided for well-equipped pathological and physiological laboratories. Later, he pressed for the appointment of William Welch as chair of pathology in 1884, the first of a brilliant coterie of research-minded teachers. He devised physical as well as philosophical ways to link the medical school with the hospital, connecting the amphitheater with the dispensary, or outpatient department, to promote clinical instruction there. He also recommended that students work in the pharmacy, pathological department, and especially the wards.

A man of action and enormous intellectual activity, Billings demonstrated time and time again the ease with which he could pass from one project to the next. (He once confessed to his friend Weir Mitchell that he eschewed outdoor exercise because turning his mind from one project to the next was exercise enough.) As an older man, he did not suffer fools well; even as a student, he had shown little patience for the Medical College's system and had been easily bored by the textbook learning and systematic lectures, which he rarely attended. He went on to describe his Civil War experiences as his postgraduate course in surgery "with its service in camps and hospitals, with battlefields for clinics—a long, weary course." Both experiences surely made him realize the importance of learning by doing, which would become the hallmark of a Hopkins education.

At Billings's memorial service in 1913, Andrew Carnegie, who knew him as the guiding intelligence behind the New York Public Library, said, "Knowledge is said to consist of two elements—what you yourself already know, and what you know how and where to obtain—of both departments our dear lost friend was master." For his design of Hopkins, Billings depended on what he already knew; his conception of the medical school looked ahead to what he knew could be obtained. ■



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ingly, the wearing work and exposure to disease—in summer the hospital became so crowded with typhoid patients that teaching was suspended—meant frequent illness for the students, compounded by exhaustion and "rheumatism of the feet," as the main symptom of ward work was recorded in reports. Georgia Nevins, a member of the first class, summed up the experience: "hours were long, the number of patients increased rapidly, there weren't enough nurses, and we were often too weary to prepare properly for our theoretical work."

Since her Bellevue days, Isabel Hampton had felt strongly that the long hours interfered with schools' teaching mission. At Hopkins she began a national campaign to reduce the nurse's working day to eight hours and extend the course of study to three years. Hampton's lobbying effort was strongly supported by Lavinia Dock. The most committed feminist of the school's leaders, Dock had made an immediate and lasting impression on her students and colleagues when she arrived in the fall of the second year. "Very soon," Adelaide Nutting wrote, "we learned an extraordinary mind was among us, a scholar, a student, a teacher of rare originality and ability." Most important, Dock and Isabel Hampton were in complete agreement over how to improve nursing education. Together after rounds or at breakfast, they talked about the need for a national organization for nurses and improved textbooks for nursing (they wrote several). In 1891, they started the Nurses Journal Club, modeled on a similar group at the hospital, to promote reading and discussion of the latest articles on the profession.

On June 5, the first class graduated, with Adelaide Nutting surprising herself by finishing fourth with a 94 on her final exams. President Gilman gave each pupil a bouquet of roses that had been supplied by chief physician William Osler, who had a more enduring souvenir to give: his famous address "Doctor and Nurse," which described the two as partners in the medical profession. Osler—like Hampton and Nutting a Canadian—proved to be a valuable supporter of the school, even though the published his address hinted at a more conventional view of nurses. Its epigraph was from the Psalms: "I said I will take heed to my ways that I offend not with my tongue. I will keep my mouth as it were with a bridle."



Cecilia Beaux painted Adelaide Nutting holding the red leather notebook she carried on her rounds, "as familiar to my pupils as any part of my uniform."

That summer Nutting, on Hampton's instructions, made herself several white linen head nurse's uniforms, returning to the pleasant surprise that Osler had selected her head nurse for the prestigious Men's Medical Ward. The new position brought her into closer contact with Hampton and Dock, and the three often breakfasted together on Sunday mornings.

The 1893 Columbian Exposition in Chicago was something of a coup for Hopkins, which sent a large delegation to its health convention. Hampton, serving on the nursing committee, gave an address on "Educational Standards for Nurses," in which she urged standardizing admission and learning requirements so that the term "trained nurse" would no longer mean "anything, everything, or next to nothing." The proposed three-year program was beginning to take shape and look more and more academic, as it included semesters and summer vacations.

THE FALL OF THE SAME YEAR brought unexpected, sometimes unpleasant changes. Lavinia Dock left to take over Hampton's old job as head of the Illinois Training School, with Nutting taking her place as assistant superintendent. Meanwhile, rumors were circulating of a romance between Isabel Hampton and gynecology resident Hunter Robb, one that might force her to give up her career (nurses were not allowed to marry until World War II). In June 1894, the news became official as the trustees formally accepted her resignation. In July Hampton was married in London: "the delicate white bouquet, with long white ribbon bows, gained more attention that any other detail," a British nursing journal wrote, "for everyone in the church knew that Miss Florence Nightingale had just sent it."

Nutting was personally surprised and troubled by Hampton's decision, and could not view it with the same romantic eye. The fears of Hampton's colleagues that marriage would mean her loss to nursing proved wrong, however; Isabel Hampton Robb remained a leader. The Society of Superintendents she had helped found in Chicago in 1893 met in 1897 to organize Nurses' Associated Alumnae (later the American Nurses Association) and made her its first president.

Still, her sudden departure left Nutting in an intimidating position, for though the trustees let her know she was their only choice to head the school, she was concerned about her own lack of experience. But after a leave of absence in 1895 to tour training schools in the U.S. and abroad, Nutting returned in September ready to push further the ideas she had developed in her years alongside Hampton and Dock. The student who once worried about her final exams had become a formidable administrator with a singleness of purpose that overcame her lack of physical strength; her calm, cold anger was feared by the pupils far more than Isabel Hampton's dramatic outbursts had ever been.

Nutting immediately submitted an outline for the three-year course to the trustees. Thanks to the lobbying already done by Hampton, the plan was approved; no doubt it helped that eliminating allowances would save the hospital money, while lengthening the course would supply more nurses for the growing hospital. The system was a great success, and hospital superintendent Henry Hurd—an early supporter—was able to report to the trustees that "the shorter hours have given the pupils time to study . . . while the [nurses'] record of good health for the year exceeds any record we have been able to present in previous years."

Although now eight hours in theory, in practice the nurses' day was still long and exhausting. In February 1896, at a meeting

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of the American Association of Superintendents, Nutting delivered a paper that made a powerful case for changing the system and established her once and for all as a leading figure in the profession. For "Hours of Duty for Nurses," Nutting had surveyed more than 100 hospitals in the U.S. and Canada and found that the great majority required 16½-hour days that included 10½-hour shifts on the wards. "Is it a condition of employer and employee?" she asked of the schools, adding bluntly, "It should not be forgotten, "that the long hours of duty in the wards may reduce pupils to a condition of servitude."

Nutting's speech could hardly be ignored by the trustees. They approved her plans for a six-month preparatory course, which began in 1901. The course, which became the foundation for diploma nursing, extended the idea that education, not labor, was the main goal of the training school. "In all other professions but nursing," Nutting said, "it is the invariable rule that instruction precedes practice. It seems curious that anything so vitally important as nursing should be the one exception to this rule."

Six years later Nutting left Hopkins for Columbia University's Teachers College, where she had helped design a course especially for nursing school directors. Dozens of graduates from Hopkins and other top schools had become superintendents, and Nutting knew from experience that a few years in nursing school was not sufficient preparation.

It was as a professor of nursing and health at Columbia that Nutting returned to Hopkins for the nursing school's 25th anniversary. At the ceremonies she paid tribute to the extraordinary opportunities that the brand-new hospital and its trustees had provided for the profession, and that the remarkable medical staff had given the students. "Some of them still treasure their notebooks;" she said, "all of them treasure their memories." She noted the "strong and enduring" contributions of Lavinia Dock. Finally, she credited the school for helping to rid nursing of "the heritage of cloistered and military ideals."

Hampton, Dock, and Nutting helped to transform nurses' training from near servitude to scientific education. The extraordinary labor and self-sacrifice they apparently deemed a fair exchange for the chance to improve their profession. "I suppose I have had a share of life to be grateful for," Nutting wrote, "the chance to work and to grow and as much freedom and power as I have had the sense to use." ■

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announced that the medical school would open October 2 for "properly qualified students," including the Women's Fund stipulations.

Ironically, while their victory was heralded later as setting the standard for medical school admission, it was a mixed victory for the women who had taken the whole three-year battle so personally. Disagreements over small points of strategy had apparently strained their relationships, whose intensity was not uncommon among women of the time. Lifelong friendships had dissolved, and the stress had taken its toll on the women's health. Thomas complained of "sense of suffocation" and told Garrett that if she didn't "break through this ever contracting net of personal difference and friction and nervous strain your health will certainly breakdown and you will lose all possibilities of real goodness."

Until her death in 1915, Garrett became increasingly preoccupied with her illnesses, from insomnia to headaches. Garrett and Thomas were living in Bryn Mawr, and they were not speaking to Bessie King or Julia Rogers. Mamie Gwinn, who had been teaching English literature at Bryn Mawr, eloped with a professor and lived the rest of her life in exile from Thomas and Garrett in Princeton, New Jersey.

Thomas lamented in a letter to Garrett that the state of these friendships was "hopeless, hopeless . . . And so & so let us leave behind this heartbreaking chapter & close it past."

Less than a year after the Women's Medical Fund gift was accepted, the first class began, with thirteen men and three women. Their progress did not immediately win converts for coeducation. Mabel Glover became engaged to her anatomy profesor, Franklin Mall, sparking Osler to comment, "As to the women students it has been a great success, 33 1/3 percent were engaged to their professors at the end of the first year." Cornelia Church dropped out after becoming a Christian Scientist. Only Mary Packard, who graduated in 1897, worked as a physician—for two years at a college settlement house and then ten years at a hospital pathology laboratory. By the turn of the century, however, enough women had gone on to successful careers that Welch would proclaim, "We regard coeducation as a success."

Garrett specified that her entire bequest would revert to Bryn Mawr College if Hopkins violated the terms of her gift (which still appear each year in the university catalogue). Garrett was to the end fully aware of the power of money, and she used it well. ■



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Welch

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would recall of launching the School of Public Health. The difficulty in the field of public health education is that the reward for this service is not such as to attract as many of the right quality as needed."

A major question was whether public health officials must be physicians, reports Fee. They were in short supply, and most had found private practice lucrative. Welch thought public health work would be as intriguing to other physicians as it was to him, but even scholarships failed to attract many as students at the new school.

Welch went beyond the German model by introducing into the curriculum all the disciplines connected with hygiene: statistics, nutrition, administration, parasitology, and physiology. Professors were given free reign to investigate on their own, and they made breakthroughs. Elmer McCollum, who had already discovered vitamin A, discovered vitamin D at Hopkins. By showing rickets to be caused by a deficiency of vitamin D, he helped wipe out the crippling disease. Charles Simon gave a new course in "filterable viruses," the world's first course in virology. Parasitologist Claude Barlow broke new ground in identifying the life cycle of the liver fluke. In China he swallowed 132 of the live parasites, and in four months of illness, back at his Hopkins laboratory, recorded every stage.

For an addition to the curriculum—sanitary engineering—Welch recruited as a professor Abel Wolman, chief of the state health department, who was credited with designing Baltimore's clean water system. Wolman, in turn, recruited engineers for the course, who turned out to be more enthusiastic recruits than the doctors. "I'll never forget the first day," recalled Wolman in a 1981 interview. "I'd sit down with them, and I'd tell them, 'You're going over and take, at the School of Hygiene (imagine! engineers!), physiology, epidemiology, and biometrics.' They said, 'What? First of all, what is that?' These are graduate students. Ten years later, they say, 'You were right. . . . It took us a while to realize how important it was.' "

Enrollment in the new school grew from only 16 in 1918 to 123 five years later. In 1922 the school's grants of $250,000 a year from the Rockefeller Foundation were replaced by a $6 million endowment, more than any previous Rockefeller grant.

Besides its yearlong course, the school also gave an all-you-need-to-know month-long course for health officers for $35. Welch stressed its practical applications: "It is not essential that a health officer should be expert in examinations of milk or water, or to be an expert bacteriologist or parasitologist, or to be able to construct a life table, though it is important that he should not become a health officer until he has learned to interpret the chemical and bacteriological findings of experts, and to guard against the chief statistical fallacies."

The ultimate application of public health theories began in the 1930s with the Eastern Health District demonstration and training area, uniting forces as diverse as the city of Baltimore, the School of Hygiene, and the Babies Milk Fund Association. Welch had dreamed of such a project and engineered the appointment of Huntington Williams, a student and dear friends, as the city's commissioner of health.

Residents of the area around the hospital were monitored, treated, and studied. In 1922 few children had received immunizations, and diphtheria was the major case of childhood deaths. By 1939, with 90 percent immunized, the area had only three diphtheria deaths.

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UNTIL HIS DEATH AT 84, WELCH refused to be contained. At 75, he started the Hopkins Institute for the History of Medicine, the first such department in an American medical school. Even at 80, as the cover of *Time* magazine anointed him dean of American medicine, Welch was still taking on public health projects.

A few years earlier, he traveled to China to celebrate a medical school established there with Rockefeller's money and Welch's advice. John D. Rockefeller caught Welch eating an unwashed persimmon from a fruit stand. Welch had warned his traveling party of the dangers of unwashed fruit. As the Flexners relate, Rockefeller cried, "You should not do that!"

"Why not?" Welch replied.

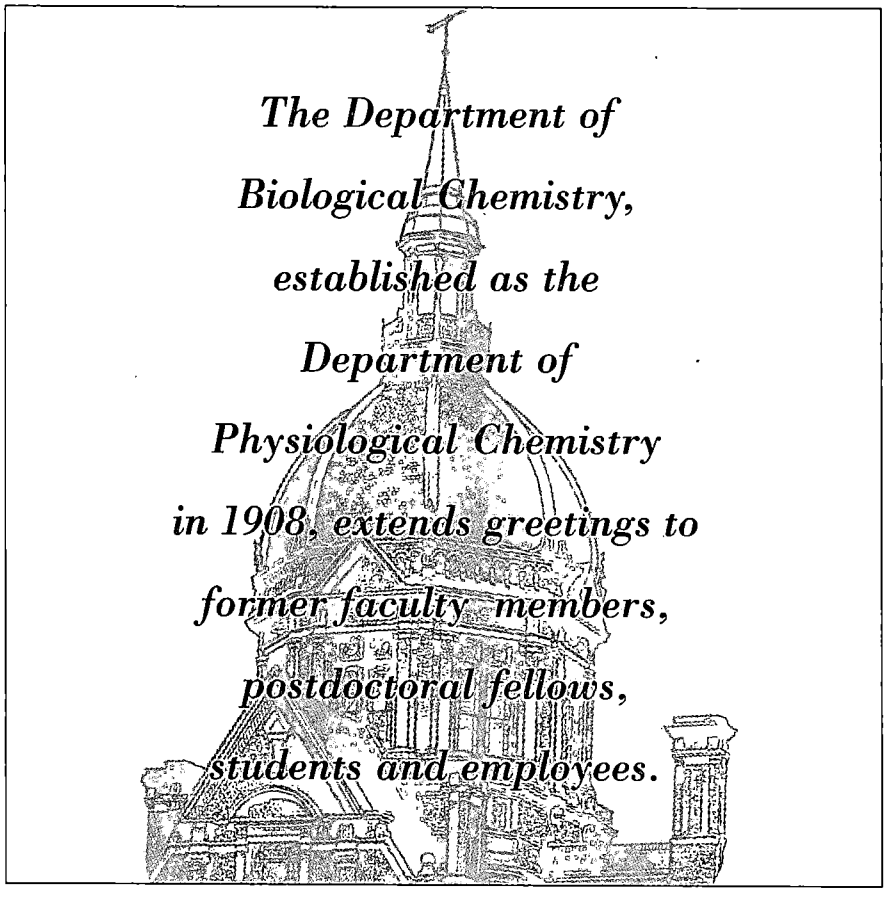
"You might get some disease."

"What, for instance?"

"You might get cholera."

"Yes, but what else?" Welch replied, as he ate the fruit.

To the end of his life, Welch gleefully indulged in his cigars, two- or three-dessert meals, and fine wine. What of his rules for good health that he promoted so well to others? "I break every one of them," he said. ■



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The Frontier of Biology

For watching the biological revolution, Hopkins is the best seat in the house.
By Jon Franklin

My first important discovery about medicine was that if I wanted to be a science writer in Baltimore, then I would have to write about biology. And if I was going to write about biology, then I would have to find my way over to John Hopkins. That was the way the secretary at *The Evening Sun* pronounced it, loud and clear: John Hopkins.

So during the 1970s, as the world got its first shock treatments in biology, I was getting mine at what I soon learned to call "The Hopkins." It didn't take long to figure out that I'd stumbled into the opening act of the biological revolution. What's more, I had the best seat in the house.

A scientist took an afternoon to explain, in great detail, how a mass spectrometer worked. A clinician showed me a new way he'd developed to read the x rays of brain tumor patients. An epidemiologist taught me how not to get lied to by statistics.

One thing was striking. Almost invariably, it was the busiest and most high-powered scientists who would drop everything and spend half a day explaining their work. I was flattered, of course, that the likes of Dick Ross or Donlin Long would take someone like me seriously.

What was really going on, of course, was not nearly so personal. The people out on the biological frontier understood that they were beginning to outdrive society's lights. It was important that the public understand what was happening.

I think it was the neuroreceptor story that drove the lesson home to me.

I remember with great clarity that June day in 1973 when Solomon Snyder and Candace Pert blinked into the camera lights and told local television reporters that they'd found the opiate receptors (we didn't know they'd been lost in the first place). Snyder explained about receptors and transmitters and agonists and antagonists. The press corps looked at him blankly.

Jon Franklin, a Pulitzer Prize-winning science writer, teaches at the University of Maryland College of Journalism.



On technology's stage: *A noisy thoracic OR can turn silent when a heart is transplanted.*

"But what does it mean to the man in the street?" one television reporter kept demanding, as his frustration level rose.

Snyder tried again, as did Pert. But there was no explaining it—not then, and not for years. The simple truth was that we in the press, as well as the public, were still trying to get a grip on behaviorism. We weren't ready for opiate receptors.

Twenty years earlier, a physicist named C.P. Snow had noticed that a cultural gap was appearing between scientists and non-scientists. By the '70s that gap had become a chasm. The revolution outpaced us, from the beginning. I remember thinking, in the total despair of the moment, that we'd never catch up, at least not in my lifetime.

An so it was, for the rest of the '70s and through the '80s. The revolution picked up steam, the stakes racheted ever higher. And if you knew your way around the Hopkins, you could cover it all from Baltimore.

Certain moments come to mind. I remember a biophysicist standing before a giant model of an immune globulin molecule, waxing poetic about its great philosophical meaning. I remember the astringent smell of the autopsy room, and the vivid colors that are hidden, until death, beneath the human skin.

I remember the first time I witnessed a heart transplant operation.

Now understand that a thoracic OR is a noisy place. In the first place, cardiac surgery attracts people with high metabolism. At any given moment there are two or three conversations going on. There's usually a radio playing, too, and for some reason a lot of cardiac surgery people like rock music. And then there are machinery and instruments that bleep and grind and clatter and whir.

This goes on for hours. The recipient is anesthesized and open on the table. The second crew arrives, via helicopter with the donor heart, and their arrival causes even more noise. And then there comes the moment when the surgeon reaches down, wraps his gloved fingers around the defective heart, and lifts it free.

The silence is instant, complete, crashing. I'd been talking to the man who ran the heart-lung machine; he broke off the conversation in mid-sentence and looked up. My eyes followed his.

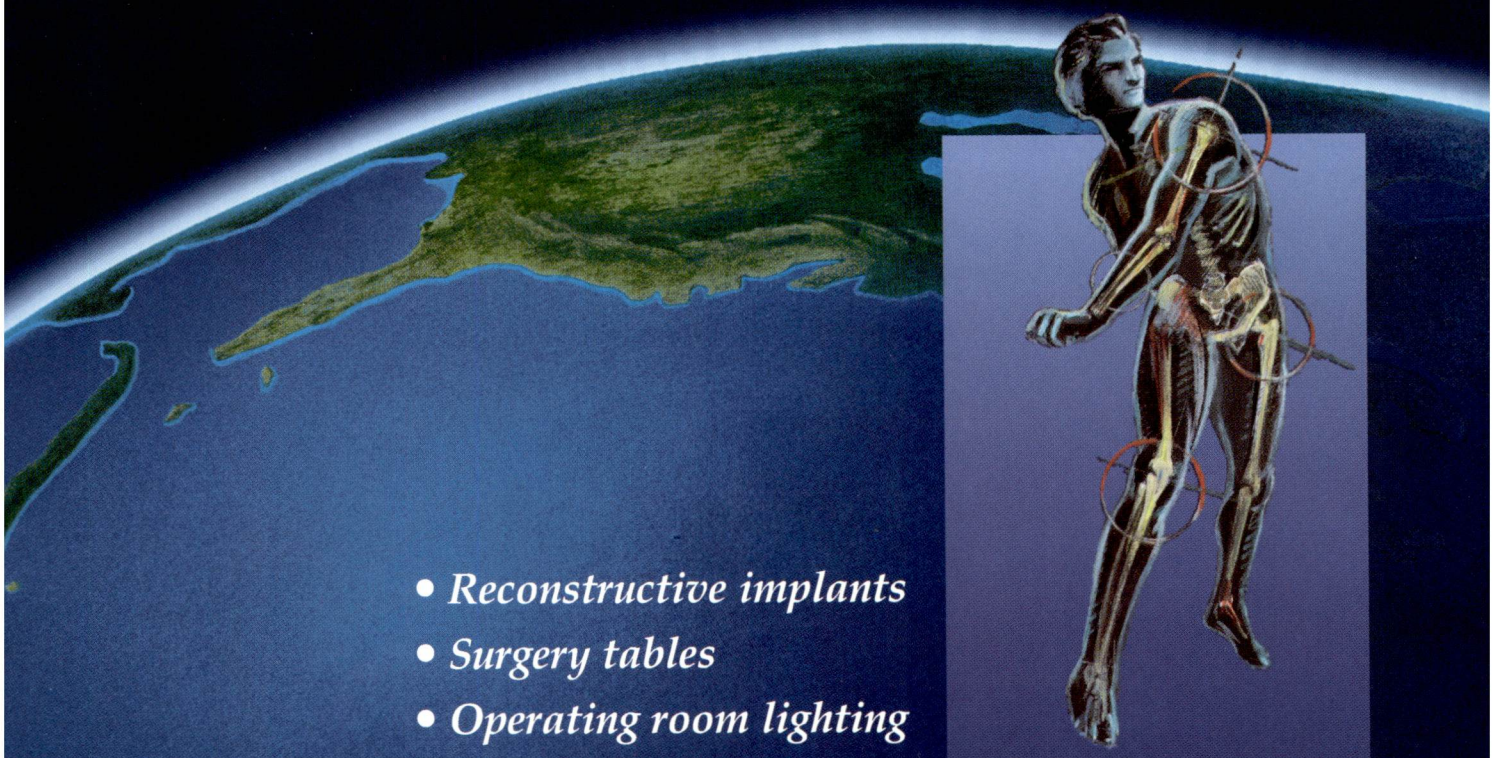
The surgeon stood there like some Aztec priest, holding the dripping heart, upon which all attention was focused.

Time, I remember, got very surrealistic. We just stood there, on technology's stage, staring at this human heart. It twitched, I remember, once or twice, as though it were trying to beat one last time.

A nurse handed over a stainless steel pan, the surgeon plopped the heart into it, and the spell was broken. Someone put a new rock music tape in the boom box and it was once again business as usual on the frontier of biology.

Later, I got to know the recipient quite well. He was an engineer, quite in sympathy with the march of technology. And he asked me, more than once, to describe what it was like that night in that OR. For however intimidating the science or technology, something magic had happened, and he of all people knew it.

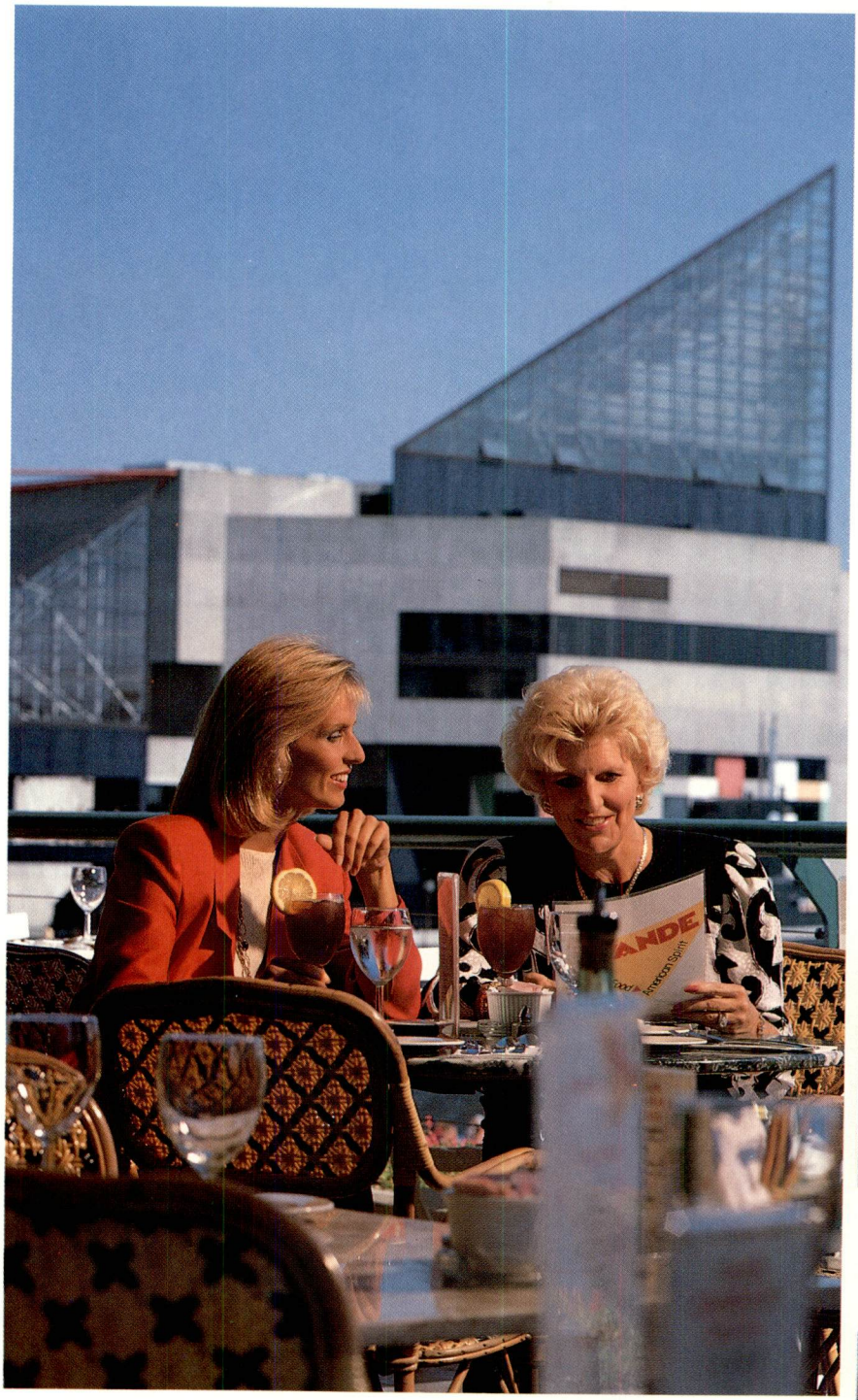
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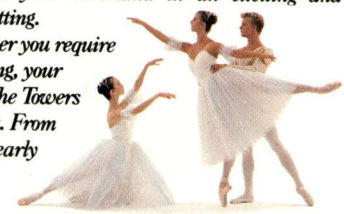
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