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Yale Medicine

YALE UNIVERSITY SCHOOL OF MEDICINE
SUMMER 2000

A new Yale clinic helps parents sort out
the medical issues surrounding

INTERNATIONAL ADOPTION



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On the cover

Georgeta Coleman is one of more than 100 children adopted from overseas who will receive an evaluation and care this year at the Yale International Adoption Clinic. Founded in 1998, the clinic helps parents and pediatricians address the health concerns that may accompany international adoption. Page 30.

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Finding the right residency requires stamina, endurance and a high tolerance for airline food (not to mention anxiety). If you thought the process leading to Match Day was a challenge, imagine doing it as a couple.
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A new Yale clinic guides parents and pediatricians through the complicated terrain of adopting abroad.
By Sandra Ackerman

LETTERS

The early days of antibiotics

To the editor:

I read with great interest John Curtis' recent article on the first use of penicillin in this country ["Fulton, Penicillin and Chance," *Capsule*, Fall 1999/Winter 2000]. It brought back memories of my own role in that event.

Mrs. Miller was a private patient of Dr. John Bumstead in the old Isolation Building of the New Haven Hospital. As such she was under the direct care of Dr. Bumstead, assisted by the junior intern assigned to the isolation service. I was that low man on the house-staff totem pole. The more senior members of the house staff were not involved with the care of a private patient.

I remember Dr. Bumstead giving me the small bottle of penicillin—a yellow powder—with instructions to take it over to Dr. Morris Tager's laboratory in the bacteriology department of the medical school and dissolve it in saline solution and pass it through a Seitz filter. This removed bacteria but not viruses. I then returned to the patient's bedside and under Dr. Bumstead's supervision gave her 5,000 Oxford units of penicillin intravenously. This dose was repeated every four hours for the rest of her hospital stay. Mrs. Miller said she liked my "needlework" and Dr. Bumstead asked me to continue to give her the injections every four hours around the clock including days and nights when I was otherwise off duty. The intravenous route was chosen because, in our ignorance, we were afraid that intramuscular injections



might cause a sterile abscess.

As Mr. Curtis reported, all of Mrs. Miller's urine was sent to Merck in Rahway, N.J., so that the penicillin could be recovered and returned to us in New Haven. After Mrs. Miller had recovered and was discharged, we had enough penicillin left to treat and cure a man with septicemia due to *Staphylococcus aureus*. Finally we had enough penicillin to start treating a young man with subacute bacterial endocarditis due to *Streptococcus viridans*. At that time this was a uniformly fatal disease. He improved, his blood cultures

became sterile, but we ran out of penicillin completely and he relapsed and died.

In the early 1970s the School of Medicine sponsored a documentary film on the first use of penicillin in this country at the New Haven Hospital. It featured an interview with Mrs. Miller and the film crew visited my office in Washington, D.C., and interviewed me regarding the events I described above. I was then chief of gastroenterology and clinical professor of medicine at George Washington University School of Medicine as well as in private practice.

Thomas S. Sappington Sr.,
M.D., HS '45
Randolph, N.H.

Before penicillin, the sulfa drugs

To the editor:

Your story on the first use of penicillin bought back memories of another first use, an earlier one, that of the first sulfa drug, which I administered to patients when I was

an intern at the New Haven Hospital during 1936-1937. The first sulfa drug was called Prontosil; it was a red liquid and was given by intravenous infusion. I cannot claim I was the first to use it, but it was the first sulfa drug and the first antibiotic that was available when I was on duty in the little isolation building next to the Fitkin pavilion.

I doubt if anyone remembers whether there was an effective treatment for infectious disease before the first antibiotic, but it was available. If anyone wishes to pursue the question further, it is told in my story "Quellung," which can be found in my Web page. The URL is <http://www.azstarnet.com/~jerritt/remember.htm>

Jerome Ritter M.D. '36
Tucson, Ariz.

Eyewitnesses to disaster

To the editor:

Thank you for the fine article about the circus fire of 1944 ["A Tragedy's Medical After-

Sorry to bug you

To the editor:

Oops! Someone pulled out the wrong slide. The image inside the cover of the spring 2000 issue of *Yale Medicine* is clearly that of a parasite belonging to the genus *Trypanosoma*, rather than *Plasmodium*. My guess is that it is either *T. brucei gambiense* or *T. brucei rhodesiense*, the causes of West African and East African trypanosomiasis respectively, although it could be *Trypanosoma cruzi*, the etiologic agent of Chagas disease. In any event, it's not the cause of malaria as stated in the caption.

Louis V. Kirchhoff, M.D. '77, M.P.H. '77
Iowa City, Iowa

Thanks to Dr. Kirchhoff for spotting the error. The image in question shows not a malaria-causing agent, but a member of the *Trypanosoma* genus, *T. brucei brucei*, which is carried by tsetse flies and causes sleeping sickness.



math,” *Capsule*, Spring 2000]. My late husband’s (Albert S. Atwood, M.D. ’45) account of his classmates’ help with the disaster obviously stirred up many vivid memories.

I was a student nurse at Hartford Hospital at the time. I recall how uncomfortable and helpless the victims of the fire were and how much care they needed from the staff. I am grateful that the medical students’ part in the tragedy was able to be told.

*Harriet Atwood
Stonington, Conn.*

Other hands helped with healing

To the editor:
At the proper interval after the Hartford circus fire several of the house staff and perhaps a few fourth-year students spent several one-day trips back and forth to Hartford skin grafting the fire victims.



I was one, as was Philip Brezina, Guido DeBlasio and probably Gervase Connor, who might have been an attending at the time. There were others whom I cannot remember.

We hoped we did a service, but we certainly learned how to use the Padgett Dermatome.

*F.J. Lepreau, M.D., HS ’40
Westport, Mass.*



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2000-2001

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JOHN CURTIS

“The most pressing need,” Ryder said, “is to establish a cadre of young Russian scientists trained in modern public health methods who are committed to returning to Russia to fill the enormous void in this area.”

Funded by the Fogarty AIDS International Training Program at the National Institutes of Health, the project has brought 10 Russian scientists and physicians to Yale for long-term training since 1998. In February of this year a four-day workshop brought top faculty from the university in St. Petersburg to Yale to learn about the institutional review board system that oversees many of the clinical trials conducted in this country.

Among the Russian scientists at Yale is Natalia Khaldeeva, M.D., Ph.D., who has treated patients with the disease since 1989. “Our experience here in the United States has been extremely valuable,” she said, noting that many resources available here, such as anti-retroviral drugs, are scarce in Russia.

During her 18-month stay at the School of Public Health, Khaldeeva has been learning how to conduct clinical trials with new anti-retroviral regimens in HIV-infected patients and has been studying HIV treatment standards and research protocols. She also has received training in HIV prevention methods and studied at the Center for AIDS Intervention Research at the Medical College of Wisconsin, Yale’s partner in the program.

Prevention efforts, Ryder believes, can have a broad impact in Russia. “There are few other countries of similar size where one has such enormous possibilities for HIV prevention,” he said.

This year the project was extended to India and China and has begun short-term training of researchers who are involved in World Bank projects on HIV prevention. “In the next two years injection-drug use will be the major mode of transmission in China,” said Zunyou Wu, M.D., Ph.D., a research scientist at the Chinese Academy of Preventive Medicine. “We also expect that sexual transmission will increase dramatically.”

“We have seen what this epidemic has done in sub-Saharan Africa,” said Michael H. Merson, M.D., dean of public health and principal investigator of the Fogarty grant. “We hope that our efforts can help avoid a similar tragedy in Russia, India and China.”

Preparing for a tidal wave

With an epidemic in the making, Russian scientists come to Yale for training in HIV prevention.

For decades the Iron Curtain limited personal freedoms within the Soviet Union and the Eastern Bloc, as well as social exchanges between East and West. Until it fell in the early 1990s, it also kept at bay the HIV/AIDS epidemic sweeping Western Europe. The number of new HIV infections in Russia hovered at only 200 a year. By 1996, however, largely due to injection-drug use, the number of cases rose to 1,546. Last year 18,140 new cases were reported in Russia, where health authorities expect that total HIV infections will reach a million by the year 2002.

“Russia is confronting what is a very early, but likely to be very massive HIV epidemic,” said Robert W. Ryder, M.D., John Rodman Paul Professor of Epidemiology and Medicine. He is also director of Training and Research in HIV Prevention in Russia, a training project for Russian physicians and scientists. Ryder and his Russian colleagues have established a multidisciplinary research center at St. Petersburg State University to develop, conduct and evaluate HIV prevention programs.



JOHN CURTIS

Top: Faculty members from St. Petersburg State University attend a workshop in the Beaumont Room on the administration of institutional review boards.

Above: Natalia Khaldeeva has received training at Yale and at the Medical College of Wisconsin through the Fogarty Program.

JOHN CURTIS



Alan Mermann talks with students Pamina Kim and Dan Prince in his office in the basement of Sterling Hall of Medicine. For nearly two decades, its homey atmosphere has encouraged visits for a chat, a cup of coffee or a crossword puzzle.

Never a cross word. Always a crossword.

The medical school's chaplain is moving on after 17 years of nurturing students.

After a lifetime of tending first to children, then to young adults, Alan C. Mermann, M.D., M.Div., is about to embark on a third career, ministering to the elderly and the sick. Mermann, 76, retired in June as the medical school's second chaplain, a post he assumed "temporarily" 17 years ago.

With its pots of coffee and stacks of newspapers, magazines and crossword puzzles, Mermann's basement office has offered students a respite from the rigors of medical education. Some have come for something to drink or to sack out on the sofas. Others have sought counseling about personal matters. The chaplain also has chaired a committee on pediatric ethics and taught courses on serious and

chronic illness, pairing students with patients who can talk about what it is like to have a life-threatening disease. "I found a patient for each student," Mermann says. "It was a patient with something serious such as metastatic cancer, AIDS, renal failure or leukemia. The patient taught the student what they were going through. They recounted their experiences with physicians such as the characteristics of the good doctor and the not-such-a-good doctor."

Mermann never has stopped studying and last year acquired a master's degree in the history of medicine. He has articulated his beliefs on faith and ethics in two books, *Some Chose To Stay: Faith and Ethics in a Time of Plague* and *To Do No Harm: Learning to Care for the Seriously Ill*, and was the author of the Yale Physician's Oath, which he administered to each graduating class at Commencement. Asked if his courses have helped shape more compassionate physicians, he answers, "It may be that the half of the class that takes the course is the half that doesn't need to."

Mermann's interest in the health of children led him to the Deep South in the 1960s at the peak of the civil rights movement. He testified before the Senate and co-authored the report on child malnutrition that helped launch President Johnson's War on Hunger. His travels through the South sent him on a search for answers to the question of good and evil that led him, at the age of 50, to the Yale Divinity School. In 1982 he gave up his pediatric practice in Guilford and a year later took on the chaplaincy. It was to be a temporary position.

continued on page 6

CAB construction gets under way

With an occupancy date of March 2003, construction of the Congress Avenue Building (CAB) continued on schedule in late June. The 450,000-square-foot building was designed to increase teaching and laboratory space and is part of a \$500 million investment in medical school facilities. After excavating the site, crews began foundation work, pouring vertical walls and footings. The work was expected to continue through August, and in September, delivery of steel beams is to pave the way for erection of the building's skeleton. Updates on the construction as well as photographs can be accessed at <http://info.med.yale.edu/cab>.

LAURELS FOR CUSHING Harvey Cushing, a legendary figure in American medicine who began and ended his academic life at Yale, has been honored as one of the two most influential neurosurgeons of the 20th century. The Congress of Neurological Surgeons (CNS) honored the 1891 Yale College alumnus as "Man of the Century, 1900-1949," and devoted a recent cover of its journal to him and to M. Gazi Yaşargil, a pioneer in cerebrovascular microsurgery who was trained by a protégé of Cushing's pupil Hugh Cairns. Cushing's one-time bursary student Lycurgus M. Davey, M.D. '43 March, who helped catalogue his collection of books in the late 1930s as a Yale undergraduate, was one of four authors who paid tribute to Cushing in the November 1999 issue of *Neurosurgery*. The journal's editor, neurosurgeon Michael L.J. Apuzzo, M.D., HS '73, also worked on the Cushing collection in 1958 as a Yale undergraduate. Yale professor Issam A. Awad, M.D., will become president of the 4,800-member CNS in November.

BIG JUMP IN APPLICATIONS

Yale bucked a national trend with a jump of 43 percent over last year's 2,469 applications to 3,530—or nearly 34 applicants for each spot in the 105-member class entering this fall. Part of the increase was due to Yale's first-time participation in the American Medical College Application Service (AMCAS), which enables students to apply to multiple schools with a single computerized application. However, Yale's increase comes as medical school applications continued a downward trend nationally. In addition to AMCAS, Director of Admissions Richard A. Silverman credits the appeal of the Yale System for the school's increasing success in attracting applicants. "We're pleased with the numbers, but even more thrilled with the quality of the applicant pool," he said. "They are a remarkably diverse group with outstanding academic, research, and extracurricular leadership records and a wide variety of experiences." ▶



JOHN CURTIS

from page 5

The chaplaincy was created in 1967 and first filled by David Duncombe. “One of the things the medical school has done in the past,” Mermann says, “is to provide a number of places where students can seek advice. All the way from ‘Where’s the best pizza?’ to ‘I need a psychiatrist.’ I think it’s a shame to lose one of the places where students can go to talk about things in depth that are important to them.”

The office endured and so did Mermann, who, helped by students who rallied to its defense, survived an attempt in the early 1990s to abolish the office for budgetary reasons.

After 17 years he felt it was time to move on. Although unsure of his plans, Mermann, a pro bono pastor at the Norfolk Congregational Church, hopes to continue ministering, possibly to the elderly. He also is at work on two books, one on the history of medicine, the other on depictions of disease in literature. Looking back on his

tenure as chaplain, he describes his interactions with students as “a gift.” “They are so bright and intelligent and questioning and hopeful that it has been a very encouraging experience to see them coming along with everything they have to offer.”

Mermann was the second and last chaplain at the medical school, which decided not to fill the position after he left. According to Nancy R. Angoff, M.P.H. ’81, M.D. ’90, HS ’93, associate dean for student affairs, Mermann, the man, can never be replaced, but the students have other resources for personal and religious counseling.

But Yale has not seen the last of Mermann. As he told a reporter several years ago when interviewed for an article on medical education, when he dies Mermann plans to be going “up there.” He was referring not to the Pearly Gates, but to the third-floor anatomy laboratory, to which he has bequeathed his earthly remains for the training of future physicians.



JOHN CURTIS (2)

Kathleen Carroll (left) and colleagues are building a clinical trials network to evaluate drug-treatment protocols. Gerald Friedland (right) and others will test the concept of peer intervention among drug users and others at risk for HIV infection.

Major awards to support work in addiction, HIV

With \$17 million in grants awarded this year, Yale investigators are furthering their efforts to slow the spread of AIDS and reduce drug abuse. Two grants will fund separate programs that rely on peer counseling as well as interventions involving physicians. The National Institute on Drug Abuse (NIDA) and the National Institute on Mental Health (NIMH) awarded the grants to Yale and other institutions in Connecticut.

One NIDA grant provides \$11 million over five years to establish a clinical trials network to evaluate drug-treatment protocols. “Typically, clinical trials research is based on a small, often homogeneous population,” said Kathleen M. Carroll, Ph.D., associate professor of psychiatry and principal investigator for the grant. “We will be able to evaluate a range of treatments in community treatment programs and reach a large, diverse population.” Yale is one of six regional cen-

ters in the country working on this project. When it is complete, it is expected to include between 20 and 30 regional centers. Joining Yale in this national effort are the Connecticut Department of Children and Families, the Department of Mental Health and Addiction Services and a nonprofit managed care company, Advanced Behavioral Health.

NIDA and NIMH also have awarded the University of Connecticut (UConn) and the Yale School of Medicine \$6 million for projects to stem the spread of AIDS. The NIDA grant will fund a study of a peer intervention group composed of active and recovering drug users who are HIV-positive. They will attempt to counsel fellow addicts and convince them to obtain treatment for HIV/AIDS. The study will measure enrollment in primary care services, adherence to HIV treatments, entry and retention in drug treatment, reduction of risky HIV behaviors and increase in medical knowledge. Robert Brodhead, Ph.D., a sociologist at UConn, is the principal investigator.



Mermann, who practiced pediatrics for years in nearby Guilford before becoming chaplain, will miss his contact with medical students: “They are so bright and intelligent and questioning and hopeful.”

The NIMH grant funds an effort to determine whether the doctor-patient relationship can be used to promote HIV risk reduction. Physicians worry that anti-retroviral therapies may lull patients into the false notion that their disease is no longer a threat. "Some still engage in risky behaviors, so we continue to see new infections, but with a virus that is more resistant to drugs," said Gerald H. Friedland, M.D., director of the AIDS Program at Yale, and co-investigator on the study. The principal investigator is Jeffrey Fisher, Ph.D., a psychologist at the University of Connecticut.

Faculty, students react to proposals for curriculum

Faculty and students have welcomed proposals to revise the medical school curriculum even as they raise questions about some of the specifics, according to Asghar Rastegar, M.D., professor of medicine and a member of the Dean's Committee on Medical Education. The committee, formed two years ago by Dean David A. Kessler, M.D., to take a thorough look at medical education, has recommended integrating the teaching of basic and clinical sciences, strengthening clinical experiences in the first two years and revisiting basic science in the clinical years. (*Yale Medicine*, Spring 2000, "Deconstructing Education.")

The committee plans to submit a draft report to Kessler by September 1. The report will include the com-



Student Sandy Scott asks a question of education committee co-chair Ralph Horwitz during a "town meeting" on the committee's recommendations to restructure the medical school curriculum.

mittee's recommendations as well as input from faculty and students, said Rastegar, deputy chair of internal medicine. Kessler may send the report back to the committee for revisions, or pass it on to the new deputy dean for education, Herbert S. Chase Jr., M.D., for implementation.

Led by Ralph I. Horwitz, M.D., chair of the Department of Internal Medicine, and Charles A. Janeway Jr., M.D., professor of immunobiology, the committee has met weekly for more than a year to discuss a restructuring of the four years of medical school. Under the committee's proposals, basic science course work would end in December of the second year, students would take a month-long course in clinical skills, then move on to laboratories or the wards.

The committee has proposed a reduction in scheduled hours in the basic science years from 1,400 to 1,100. During their clinical years students would have 12 months on the wards and an opportunity to schedule an uninterrupted block of six months for thesis research. The committee is considering ways to integrate basic sciences in a mean-

ingful way in both the third and fourth years.

Faculty members want to ensure that adequate supervision is built in to the six-month period proposed for thesis research, Rastegar said. At "town meetings" held to discuss the proposals some faculty expressed concerns that basic science departments would lose control of their courses. Others believe that meaningful support of faculty who have significant teaching roles is needed to improve the educational environment.

Students, meanwhile, are concerned about the integration of basic and clinical sciences. "They wanted to be assured that, by condensing the first two years into 15 months, what would be achieved would be an enhancement of the quality and not just loss of time and material," said Nancy R. Angoff, M.D. '90, HS '93, M.P.H. '81, associate dean for student affairs.

Issues for future discussion include governance of the curriculum, strengthening clerkships and the role of technology in medicine and teaching.

FACULTY PRACTICE ELECTS

GOVERNORS The Yale Faculty Practice, the multi-specialty academic medical practice composed of over 650 School of Medicine faculty members, has elected its first board of governors, choosing 10 physicians to set policy and oversee clinical and business activities. David J. Leffell, M.D., director of the Faculty Practice and associate dean for clinical affairs, said the elected representation is needed to achieve the goals of the medical school's clinical enterprise. The newly elected members of the board of governors include department chairs Gary E. Friedlaender, M.D.; Ralph I. Horwitz, M.D.; Jon S. Morrow, M.D.; Dennis D. Spencer, M.D.; and Robert M. Weiss, M.D. Clinical faculty representatives are Zeev Kain, M.D.; Norman J. Siegel, M.D.; Barbara A. Ward, M.D.; Madeline S. Wilson, M.D.; and Barry L. Zaret, M.D. The board's appointed members are Leffell, Marna P. Borgstrom, executive vice president and chief operating officer of Yale New Haven Health System; Peter N. Herbert, M.D. '67, senior vice president and chief of staff of Yale New Haven Health System; Irwin M. Birnbaum, chief operating officer of the School of Medicine.

A CHANGING TERRAIN IN THE TOBACCO WARS

In the mid-1990s it seemed unthinkable that the Food and Drug Administration might regulate tobacco, but Dean David A. Kessler, M.D., then FDA commissioner, did just that. One might have expected disappointment in March of this year when the Supreme Court, in a 5-4 decision, overturned federal regulation of tobacco products. But Kessler found cause for optimism. "We're in a very different place than we were five years ago," he told *The New York Times* on the day of the decision. ▶ page 11

Web site offers a wealth of data about the heart

A tour through the heart and chest, with side trips into a wide range of diseases and diagnostic and therapeutic tools, is now as close as a computer keyboard for medical students and physicians. *Introduction to Cardiothoracic Imaging*, a new Web site developed at the School of Medicine, has drawn visitors from along Cedar Street and around the world since its debut in December.

Visitors to the site can explore the material, which is organized under five topics: anatomy, techniques, findings, cases and references. Under anatomy, viewers can see drawings of the heart and chest, then click to an X-ray image. A click on the left pulmonary vein brings a brief explanation to the screen.

The text, charts, X-rays and drawings are designed for a variety of uses, said John Paton, director of academic computing and media services. Lecturers can pull individual slides and transfer them to a PowerPoint presentation. Teachers can download images for inclusion in quizzes and students can pull out the pages they need for study. "It is an effort to get all the material in one place and allow people to get whatever they feel would be helpful," Paton said.

The site is a Web version of a CD-ROM produced in 1994 by C. Carl Jaffe, M.D., professor of medicine, and Patrick J. Lynch, M.S., design director at the Center for Advanced Instructional Media. The CD-ROM used artwork, diagnostic images and text entirely generated at the School of Medicine. Rather than continually update the CD-ROM, they

decided to convert it to a Web format. After four months of work on the conversion, the site, at <http://info.med.yale.edu/intmed/cardio/imaging/>, was launched in December.

Visitors made about 10,000 page requests from the site that month. A fifth of the visitors were from education sites in the United States. By May, monthly page requests had increased to 17,000 pages, making it one of the most visited sites at the medical school.

Office provides new support for telemedicine

For many, the notion of telemedicine evokes the image of a doctor in the wilds, armed with only a cell phone, a stethoscope and a laptop, transmitting medical data to a modern hospital and receiving life-saving information in return. Two recent expeditions that took Yale physicians to Mt. Everest to test telemedicine concepts and tools have cemented that concept, as has Yale's participation in a mobile surgical unit that uses telemedicine to bring health care to the jungles of Ecuador. But practitioners say telemedicine also may be as mundane as a second opinion obtained over the phone or consultations with physicians in rural areas where specialists are scarce.

Spyros G. Condos, D.Med., M.B.A., the director of the newly created Yale Office of Telemedicine, is in no hurry to define the topic. "The moment you define it," he says, "you start limiting it." The School of Medicine

recently announced the appointment of Condos, an assistant professor of surgery, as director. Also appointed were Johanna Selles, R.N., Ed.D., as business manager, and Richard S. Stahl, M.D., M.B.A., as medical director.

According to Joseph B. Warshaw, M.D., deputy dean for clinical affairs, the new office formalizes and coordinates what had been a diffuse set of projects throughout the medical school. "It was departmental," said Condos, "and sometimes one department doesn't know what the other is doing." The office will serve as a clearinghouse and resource center for telemedicine programs throughout the medical school. Its goal is a marriage of medical knowledge and information technology that will provide the best in clinical care domestically and overseas, while also training physicians around the world. Selles said the office is developing projects in Saudi Arabia, the Philippines, Greece, China, South Africa and India.

"We want to help people by providing information on how to accomplish their goals in telemedicine projects," says Stahl, "This medical center is rich in educational content and has a lot to offer people and places."



Heavy hitter: C/AIM's content-rich cardiothoracic resource is one of the top-drawing Web sites at the medical school.



KLAUSNER

BRANDLING-BENNETT

HORTON

PETERMAN

FLORES

An organizing principle for cancer therapeutics

As knowledge of the human genome advances, physicians are finding ways to tailor cancer prevention and treatment to specific molecular targets, according to Richard Klausner, M.D., ¹ director of the National Cancer Institute. Speaking at grand rounds in February on *The Taxonomy of Molecular Targets*, Klausner said, "I think we are beginning to see ways that we can organize the extraordinary complexity of genetic change in cancer." The challenge for oncology and general medicine, he said, is to develop a usable, meaningful phenotypic database. "We are going to have a hard time developing successful therapies if we can't understand the targets we're looking at."

The uneven distribution of health care

Wealth is more concentrated in Latin America and poverty rates are four times those of countries with similar gross domestic products, said David Brandling-Bennett, M.D., ² deputy director of the Pan American Health Organization, speaking at grand rounds at Epidemiology and Public Health in February. That adds up to poor health care for large segments of the population. "We are not attending to the needs of those who are the neediest," he said. Governments, he continued, must ensure that basic health services of adequate quality are provided equitably. Of the \$2.3 trillion spent on health care annually around the world, 90 percent is spent in industrialized nations. "We are not addressing the issue of disparity in health."

Where Harley Street crosses Fleet

As editor of *The Lancet*, Britain's leading medical journal, Richard Horton, M.D., ³ finds himself straddling two worlds. "Editors have one foot in the perfumed halls of academia and the other in the sewage-strewn gutters of the press," he said in April at the 52nd annual meeting of the Associates of the Cushing/Whitney Library. His journal's readership is a broad clinical audience. Only 300 of the 6,000 manuscripts submitted each year are published, Horton said, and they must meet journalistic as well as scientific criteria. When they find their way into the hands of the lay press, misinterpretations can have unfortunate results. One study published in his journal described a possible link between submissiveness in women and lower rates of heart disease. The resulting newspaper headline? "Put down

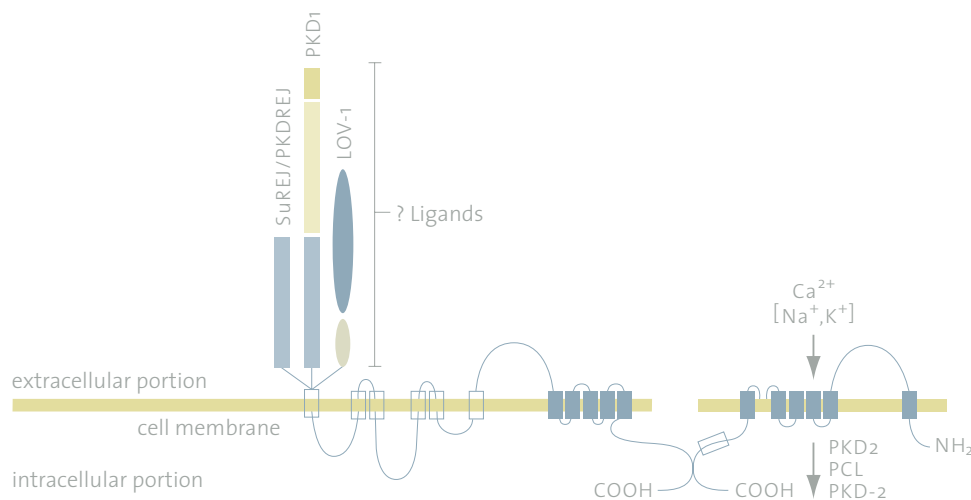
that rolling pin, darling, it's bad for your heart." Another press report, however, led parents to the mistaken belief that childhood vaccinations could cause developmental disorders. "There was a panic, a serious drop in the uptake of the vaccine," Horton said. "The effect was catastrophic."

Linking HIV care to socioeconomic

Many interventions aimed at stemming the spread of AIDS miss the point, says Tom Peterman, M.D., ⁴ chief of the prevention studies section at the Centers for Disease Control and Prevention. They assume, he said during a talk to Yale AIDS researchers in March, that individuals are in control of themselves and their environment. But in this country the disease is increasingly associated with high rates of poverty, homicide, teen pregnancy, drug abuse and other sexually transmitted diseases. "It is hard to ignore race and racism as a factor in public health in the United States," he said. "It is a pretty consistent finding that income inequality, more than income, determines health."

Communicating in the clinic, across cultures

Language and culture can come between patients and caregivers, sometimes with disastrous clinical consequences, said Glenn Flores, M.D., ⁵ co-director of the Pediatric Latino Clinic at Boston Medical Center. "Culture affects clinical care," Flores said during his talk in March, "Culture and Patient-Physician Relationships: Achieving Cultural Competency in Health Care," sponsored by Y-NHH Ambulatory Services. "It affects outcomes and it affects quality of care." He cited the example of a physician who failed to grasp the severity of a Mexican girl's abdominal pain because her parents spoke no English. After two return visits to the emergency room she was diagnosed with peritonitis. In another case, a mistranslation led to suspicions of abuse and a mother's uninformed consent to turn her daughter over to child welfare officials. Caregivers, he said, must be familiar with the language and culture of their patients. "What is not going to work," he said, "is to say, 'Let's all be sincere, let's hold hands and sing 'We Are the World.' We need to have a more diverse work force."



Mental illness a barrier to cardiac care

In a first-ever study of the role mental illness plays in cardiovascular care, a team of Yale psychiatric and public health experts found that mentally ill patients receive significantly fewer cardiovascular procedures following a heart attack than other patients. Previous studies have shown that race and gender are important factors in the treatment of cardiovascular patients, but this is the first study to show that mental health also plays an important role in cardiovascular care unrelated to the patient's other health and social issues.

The study's findings, which appeared in the January 26 issue of the *Journal of the American Medical Association*, showed that a mental disorder



Psychiatrist and epidemiologist Benjamin Druss wondered if mental illness prevents some patients from receiving adequate coronary care. Analysis of 113,000 cases indicates that it does.

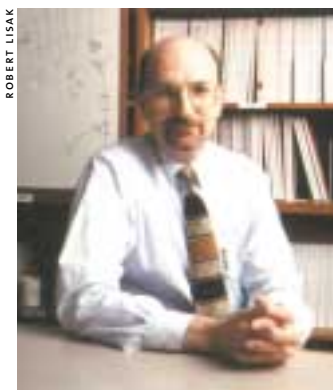
NIH funds \$5.6 million center for PKD research

A five-year, \$5.6 million grant awarded by the National Institutes of Health has established Yale as one of four centers of excellence for the study of a kidney disorder that is the nation's most common life-threatening genetic disease. The new center brings together investigators from several departments to focus on polycystic kidney disease (PKD). Plans also are in the works to add a clinical component to speed translation of research discoveries into treatment advances.

Although not all people with the disease are aware of the diagnosis, PKD is believed to affect some 600,000 Americans. The inherited disorder causes cysts to develop in the kidneys, interfering in their normal functioning and frequently resulting in the need for dialysis or transplantation. There is no treatment or cure for the disease, which results in about 1,000 deaths each year due to kidney failure.

According to nephrologist Stefan Somlo, M.D., associate professor of medicine and genetics and head of the center, "We're now able to bring in new investigators and new approaches to study a disease for which there are currently no specific treatments." When it opens, the clinical center "will take advantage of the basic-science expertise here and make it more accessible for patients."

Yale has long been active in PKD research. In 1996 Somlo and colleagues discovered PKD2, which is one of the two genes known to cause the disease. The other is PKD1. In January, Somlo and colleagues published findings in *Nature Genetics* about some of the previously unknown normal functions of PKD2. "We know that loss of function of either PKD1 or PKD2 causes the disease," he said. "We don't know what the genes' normal functions are, but we're getting much further along." By understanding those functions, new avenues for treatment, prevention and, perhaps, a cure for PKD may emerge.



Above: Stefan Somlo heads Yale's new PKD center of excellence, one of four in the nation devoted to research on the inherited fatal kidney disorder.

Top: PKD1 and PKD2 and their related proteins interact with each other either physically or through signals. When the PKD1 or PKD2 genes malfunction and fail to produce functional proteins, cyst formation may result.

reduces a patient's chances of receiving otherwise standard cardiovascular procedures, including angioplasty, coronary-bypass surgery, and cardiac catheterization, by up to 32 percent. According to the director of the study, Benjamin G. Druss, M.D., M.P.H. '95, assistant professor of psychiatry and of public health, "It's analogous to findings in the race and gender literature about differences in practices. This difference in care was not based on the severity of cardiac illness, or socioeconomic, hospital or regional differences between groups." The study looked at a range of serious mental disorders, including schizophrenia, anxiety, depression and substance abuse. "We saw a similar pattern across the spectrum," said Druss.

The causes for the differences in care are not entirely clear. "It's complicated," said Druss. "Our best guess is that it's something going on at the level of the patient-provider interaction. There's obviously something going on that merits a closer look, and efforts should be made to raise patients' and physicians' consciousness about the issue."

Druss is now leading follow-up studies looking into longer-term outcomes and quality of care for patients with mental illness and ways of overcoming barriers to their care.

Anti-cocaine vaccine passes first hurdle

Most of the 900,000 cocaine abusers who seek treatment for their addiction each year in the United States eventually find their need for the drug irresistible and begin to use it again. An experimental vaccine designed to suppress the high that users get from taking cocaine may one day prove a tool for reducing that relapse rate. A Yale clinical study of the vaccine, TA-CD, found that it produced cocaine antibodies that could potentially keep the drug from reaching the brain and inhibit its effect.

Thomas R. Kosten, M.D., HS '81, professor of psychiatry and chief of psychiatry of the VA Connecticut Healthcare System, and his team administered the vaccine to 34 cocaine

abusers who had three- to 10-year cocaine habits and were living in a residential treatment facility. Supported by the National Institute on Drug Abuse, the study showed that TA-CD generated drug-specific antibodies, which bind to cocaine and may prevent it from traveling through the bloodstream to the brain, neutralizing its psychoactive effect. The vaccine's effectiveness in producing cocaine antibodies persisted throughout the trial.

"The vaccine is very safe, and we did not observe any major side effects," said Kosten. "TA-CD offers the potential for a completely new and highly viable approach to a very serious problem for which there are no alternative medication therapies available. But we just don't know yet about its benefits for preventing cocaine relapse."



Cocaine addiction is the target of an experimental vaccine that generates antibodies specific to the drug. Investigators will next look to see whether TA-CD can prevent cocaine from reaching the brain, thus inhibiting or neutralizing its effects.

◀ from page 7

He believes there is widespread agreement on what should constitute FDA regulation of tobacco. Tobacco should, he said, be regulated as a drug as a unique product, there must be constraints on marketing to youth, the FDA should be empowered to remove harmful agents from tobacco, and a regulatory process should encourage the development of "safer" cigarettes. He also noted that the justices acknowledged the dangers of smoking and that one tobacco company has agreed that the FDA should regulate its product. "Today's decision really puts the issue squarely in the lap of Congress," Kessler said. "The Supreme Court really has said that Congress has a moral responsibility to act."

A QUARTER-CENTURY OF TRAINING PHYSICIAN-SCIENTISTS

The Medical Scientist Training Program will celebrate its 25th year of training physician-scientists at the Yale University School of Medicine with a reunion this fall. Scheduled for Nov. 3-4, 2000, the reunion will be open to current trainees as well as graduates. It will feature scientific talks by graduates and panel discussions on the future training of physician-scientists and career pathways taken by graduates. A poster session will highlight the work of current students.

The program, generally referred to as the M.D./Ph.D. Program, trains medical students in the basic sciences through completion of a Ph.D. Since 1975 it has been funded by the National Institute of General Medical Sciences of the National Institutes of Health. Most of the program's 160 graduates have gone on to conduct biomedical research. Eighty students are currently training in the program and participation is expected to increase to go over the next five years, with continuing support from the NIH and funds from the School of Medicine.

For further information regarding the M.D./Ph.D. reunion, contact Susan Baserga, M.D./Ph.D. '88, associate director of academic development at (203) 785-4403. ▶

Stress worsens arrhythmias, increasing risk of sudden death

Stress is as much a part of daily life as traffic jams and taxes. For those susceptible to arrhythmia, an abnormal heart rhythm, psychological stress can be especially dangerous because according to a Yale study, it alters the characteristics of the arrhythmias, making them potentially deadly.

The study sought to explore how mental duress affects the hearts of patients with implantable cardioverter-defibrillators. Using a programmed stimulation system, the researchers triggered arrhythmias as part of routine testing of the defibrillators. Then they induced mental stress by asking the patients to discuss upsetting or frustrating situations and by grilling them with rapid-fire arithmetic problems, again triggering arrhythmias with programmed stimulation. The results, published in the January 18 issue of *Circulation*, a journal of the American Heart Association, showed that not only did programmed stimulation during mental stress induce faster arrhythmias than those induced during rest, but these arrhythmias were also more difficult to terminate.



ROBERT LISAK

Rachel Lampert set out to explore the ways in which mental stress can influence the heart's electrical system, with the ultimate goal of better predicting and managing cardiac arrhythmias.

According to cardiologist Rachel J. Lampert, M.D., assistant professor of medicine and the study's principal investigator, "This shows that mental stress situations that raise adrenaline levels alter the behavior of arrhythmic circuits, making them potentially more deadly." Lampert hopes to develop preventive therapies and prognostic tools for at-risk patients. "For people with arrhythmias," she said, "interventions aimed at blocking responses to stress may be helpful."

Rate of tick-borne disease higher than suspected

Ehrlichiosis, a disease carried by the same tick that transmits Lyme disease, is occurring at much higher rates than previously suspected. A three-year surveillance study of southeastern Connecticut residents found annual rates of ehrlichiosis ranging from 24 to 51 cases per 100,000 inhabitants. As happened with Lyme disease after it was first described by Yale scientists in the mid-1970s, rates of reporting of ehrlichiosis are expected to rise rapidly. The annual rate of Lyme disease in the same survey area is 300 cases per 100,000 persons, up from the 50 cases per 100,000 people in the 1970s, according to associate research scientist Jacob IJdo, M.D., who was the lead author of the study.

Conventional Lyme treatment found effective

Patients who undergo conventional antimicrobial treatment for Lyme disease report no greater level of health problems years later than comparable groups who did not have the disease, according to the largest study to date of long-term effects of the disease. "The outcomes of the vast majority of patients with Lyme disease were excellent and not much different from those who had not had the condition," said one of the study's authors, Eugene D. Shapiro, M.D., professor of pediatrics and of epidemiology.

As reported in the February 2 issue of the *Journal of the American Medical Association*, the study looked at 678 patients. "The degree of anxiety about Lyme disease that many people have doesn't appear to be justified, given the positive, long-term outcomes of treated patients that we have observed," said Shapiro. "The prognosis for the vast majority of Lyme disease patients who receive conventional antibiotic treatment is excellent."

Lyme disease has been a lightning rod for controversy for years, with a vocal group of patients and some physicians insisting that the disease is underdiagnosed and undertreated. Many physicians, however, counter that a short-term regimen of antibiotics is adequate to treat the disease.

FINDINGS

Bench discovery raises hopes for therapy in spinal cord injuries

Scientists can regrow severed brain and spinal cord axons in the laboratory, but something in the adult central nervous system prevents their regeneration in humans. As a result, paralysis and other disabilities resulting from brain or spinal cord trauma are irreversible in most cases. Three separate research teams, including a group from Yale and Harvard, have identified a gene and its protein that appear to block axon regeneration. The discovery of what is termed “Nogo” raises the possibility of developing a therapeutic means of inhibiting its activity, increasing the hopes that brain and spinal cord injuries might one day be reversible.

Previous experiments have shown that the natural adult brain environment contains one or more substances that inhibit the regrowth of central nervous system axons, unlike nerve cell connections in other parts of the body.

Three papers published in the January 27 issue of *Nature*, including the Yale-Harvard group's, reported the cloning of Nogo and identified its activity as an inhibitor present in the brain and very likely responsible, at least in part, for the failure of axons to regenerate.

The Yale-Harvard study showed that the Nogo protein, by itself, stops axon growth in laboratory conditions. The protein is found only in those areas of the brain which are most hostile to axon growth.

“Is this the answer?” asks Stephen M. Strittmatter, M.D., Ph.D., associate professor of neurology and of neurobiology, leader of the Yale team. “We’re pursuing experiments that will take things to the next step.” These include generating a mouse model in which the Nogo gene will be “knocked out” or disabled, and then inducing central-nervous-system injuries to see if axons regenerate. The Yale members of the group also are trying to develop a possible blocker for the action of Nogo and to identify the receptors mediating its activity.

NEW HAVEN HEALTH INFORMATION AT THE CLICK OF A MOUSE Two years after its introduction, a Web site designed to provide users with everything from health statistics to listings of regional public health services had its official launch in January. The New Haven Health site, <http://info.med.yale.edu/newhavenhealth>, provides access to University, local, state and national resources describing New Haven's public health and serves as a repository for health data, documents and directories of community organizations. Over the past two years staff at the Cushing/Whitney Medical Library and the Epidemiology and Public Health Library, who created and maintain the site, improved on its basic structure by adding information such as historical images related to New Haven's health history and annual reports from the city. In addition, links to other health sites were added. By the fall, library staff hope to add a geographic information system with maps that pinpoint pockets of disease in the New Haven area. The site was funded by the National Library of Medicine.

HIGH SCHOOLERS GET DOWN TO THE MICRON Most high-school students work with low-powered microscopes and magnifying glasses in their science projects. Students at Hill Regional Career Magnet High School near the School of Medicine are learning from a research-quality Zeiss EM109 electron microscope, an instrument capable of viewing molecular structures. The microscope was donated to the school by Yale in conjunction with the Connecticut Electron Microscopy Society. Yale and Career High already have an extensive partnership for teaching area students about biomedical science.

A Yale-directed team, including Barry Piekos, supervisor of the electron microscope laboratory in the Department of Molecular, Cellular and Developmental Biology, maintains the instrument and trains teachers and students in its use. ▶



The discovery of the nerve growth inhibitor Nogo has introduced a potential avenue for restoring function in spinal cord injury cases. Stephen Strittmatter and colleagues will next use a mouse model to better understand Nogo's behavior.

FINDINGS



Barry Green found that test subjects perceived “thermal taste” differently in different parts of the tongue.

The “taste of temperature” not such an odd notion

What does a change in temperature taste like? According to a study by Yale investigators, the same salty, sweet or sour tastes that are normally caused by food, drink and other chemical substances on the tongue.

“We’ve discovered that specific tastes can be produced by temperature stimulation, just as certain chemicals can evoke only certain taste qualities,” said Barry G. Green, Ph.D., professor of surgery in the section of otolaryngology and a fellow of the John B. Pierce Laboratory, who directed the study. The paper, which was published in the February 24 issue of *Nature*, is the first to show how the brain interprets thermal stimulation of the tongue. The investigators cooled and warmed various areas of the tongue under pre-

cisely controlled conditions to study what taste sensations subjects experienced.

Individuals perceived “thermal taste,” as it is called, differently on different parts of the tongue. Warming the front of the tongue induced sweetness and cooling it produced a salty or sour taste, while chilling the back of the tongue created a sour or bitter sensation. However, not everyone experiences thermal taste and the exact temperature conditions needed to produce it are rarely encountered in daily life.

The close relationship between temperature and taste qualities suggests that receptors in the tongue that respond to chemicals have certain properties that make them vulnerable to specific kinds of temperature change. This information may provide clues to understanding the nature of these receptor processes, as well as potential therapies for when they go awry.

Animal model developed for Type I diabetes

Insulin-dependent, or Type I, diabetes is one of the most common and potentially devastating chronic diseases. Yale investigators took a step toward unlocking the mechanisms behind it by creating an animal model showing one gene can cause the disease, while another gene can provide resistance to it. The findings were made when the researchers induced diabetes in a mouse with HLA-DQ8 in the presence of the B7 co-stimulatory molecule. HLA-DQ8 is a human gene long suspected of being a factor in the disease. They also prevented diabetes from developing in a transgenic mouse expressing the HLA-DQ6 gene.

Type I diabetes is an autoimmune disease in which the body produces an immune reaction that attacks its own tissues, eventually preventing the pancreas from producing insulin, which is necessary for the body to metabolize sugars. Researchers have previously shown in the laboratory that HLA-DQ8 is associated with diabetes. The study’s lead author, immunologist Li Wen, M.D., Ph.D., assistant professor of medicine, said: “This is the first time it has been shown in vivo that HLA-DQ8 causes Type I diabetes and HLA-DQ6 confers resistance. Not only can we now study the molecular mechanism in more detail in a living organism, this is also very important for work in preventing and even curing the disease.”

The study was published January 3 in the *Journal of Experimental Medicine*. Wen and colleagues are now looking further into the roles of both genes in diabetes.

A new form of Ras is identified

A Yale molecular biologist in collaboration with a colleague in Korea has identified a new type of Ras protein, a class of genes known to be involved in nearly a third of all cancers. Because the new protein is different from the other known Ras proteins, the finding opens up a new area of study.

Sankar Ghosh, Ph.D., associate professor of immunobiology and an associate investigator in the Howard Hughes Medical Institute, and his colleague found the new protein, kB-Ras, during studies of NFkB, a factor involved in relaying genetic information. kB-Ras regulates the action of NFkB. “What was surprising,” said Ghosh, “was that other Ras proteins have characteristic mutations that cause cancer, but kB-Ras has the mutation in its natural form.” Unlike the others, however, kB-Ras lacks essential components for traveling to the cell membrane, which would be necessary for it to cause cancer. The finding was reported in *Science* in February.

The scientists are now studying various aspects of the gene and making an animal model. “We want to find out if there are mutated states in which it could become an oncogene,” Ghosh said.



Patricia Goldman-Rakic directed two recent neurobiological studies, one on a compound that reverses memory loss, the other on the brain's dopamine receptor system.

A drug that may reverse memory loss

Short-term, or working, memory is often lost due to age, mental illness and long-term treatment with antipsychotic drugs. A Yale study found that an experimental drug provided long-lasting reversal of memory loss in primates, offering hope for humans suffering from working memory loss.

In the study published in the March 17 issue of *Science*, Yale investigators found that even short-term treatment with the experimental drug ABT-431 reversed memory loss in monkeys that were being administered haloperidol, an antipsychotic compound that causes loss of short-term memory in these animals. The principal investigator for the study, Patricia S. Goldman-Rakic, Ph.D., professor of

neurobiology, neurology and psychiatry said, "What's remarkable about this particular drug is that patients would only need to use it for a short period of time to achieve long-lasting effects. Experiments at Yale are investigating the cellular and molecular mechanisms of this drug's actions and it is not currently available for clinical application."

Protein plays role in regulation of dopamine

Researchers at Yale and the Medical College of Georgia have taken an important step in unraveling the complex molecular interactions in the brain's dopamine receptor system. The discovery by Clare Bergson, Ph.D., formerly at Yale and now at the Medical College of Georgia, of a new

protein in the dopamine signaling pathway, calcyon, could pave the way for new treatments for mental illness, including Parkinson's disease, schizophrenia and possibly attention deficit hyperactivity disorder.

The protein is named for "calcium on" because it interacts with one of the known dopamine receptors in the brain, the D1 receptor, to enhance release of calcium, which increases dopamine's activity. Low levels of dopamine activity are associated with mental illness. The work was done with brain cells in the laboratory. "The next step," said Patricia S. Goldman-Rakic, Ph.D., professor of neurobiology, neurology and psychiatry, and primary investigator at the Conte Center for the Neuroscience of Mental Disorders, "is to learn if calcyon can increase the response of these neurons in the living animal."

LIGHT AT THE END OF THE CARPAL TUNNEL The conventional surgical procedure for alleviating the severe pain and disability associated with carpal tunnel syndrome requires an incision into the sensitive palm. Associate Professor of Plastic Surgery J. Grant Thomson, M.D., is one of the few surgeons using and training surgical residents in an alternative procedure that does not require surgery on the palm. This system utilizes one incision at the wrist into which an endoscope is introduced to release the carpal tunnel. "It's much less painful and it avoids a scar on the palm," Thomson, director of the Yale Hand and Comprehensive Microsurgery Center, said. "People can use their hands almost immediately, and they return to work much quicker."

NO LINK FOUND BETWEEN PCBs, DDE AND BREAST

CANCER Many have suspected that exposure to polychlorinated biphenyls (PCBs) or the pesticide DDE was linked to an increased risk of breast cancer in women. In the largest controlled study to date, Yale researchers found no link between the toxins and breast cancer. Blood serum levels of PCBs and the organochloride compound DDE in nearly 1,000 Connecticut women were analyzed for association with breast cancer risk. No significant difference in serum levels was found between the women with breast cancer and a control group without the disease.

The study, directed by Tongzhang Zheng, Sc.D., associate professor of epidemiology, appeared in the February issue of *Cancer Epidemiology, Biomarkers & Prevention*. ▶



ROBERT LISAK

In determining the atomic structure of a complex involved in labeling cell products for proper distribution, Jennifer Doudna, above, and Robert Batey made an unexpected finding about SNPs.

Molecular ‘ZIP coding’ system speeds proteins to their appointed destinations

From brain receptors to hormones, nearly half of the proteins in the body serve to transport biochemical information from one cell to another. Yale researchers have now described a major component of the molecular machinery for reading the “ZIP code” that guides a protein’s movement from the inside to the outside of the cells. The findings open up a new window on evolution and offer possible novel targets for drug discovery.

In a cover story in the February 18 issue of *Science*, the study revealed the molecular details of the machinery that identifies and delivers proteins to their correct destination. A protein first must be identified for transport, then find

the right target and, finally, be transported through cellular membranes to its destination. Under the direction of Jennifer A. Doudna, Ph.D., professor of molecular biophysics and biochemistry and an associate investigator of the Howard Hughes Medical Institute, co-investigator Robert Batey, Ph.D., determined the atomic structure of the protein-RNA complex that recognizes an amino acid ZIP code tag, or signaling sequence, that identifies proteins to be transported to the cell membrane for secretion.

This complex, part of the signal recognition particle, or SRP, was already known to serve a recognition function, but the discovery suggested a previously unknown and surprising role for RNA in the direct recognition of the amino acid ZIP code, or signal peptide, in the protein being identified for transport. “We think that the RNA and the protein in the SRP work together to recognize the signal peptide,” Doudna said. “Previously it’s been thought that the functions of the proteins and the RNA were separate. Here we are seeing an example of true molecular collusion.”



Preventive factor may be a cause of heart disease

According to a Yale study, a key immune factor produced by white blood cells that was thought to prevent hardening of the arteries may actually cause arteriosclerosis, one of the most common contributors to potentially lethal heart disease. An interdepartmental team of surgeons and scientists found that interferon-gamma, which is produced by white blood cells and was previously believed to inhibit the processes responsible for arteriosclerosis, increased blockages in animal models.

The researchers were looking to develop new animal models to assess human transplantation responses. Heart transplants frequently result in the greatly accelerated development of arteriosclerosis. The scientists inserted segments of arteries from pig or human hearts into the major blood vessel of mice that lacked immune systems and, as such, could not reject the foreign arteries. When the mice were treated with injections of pig or human interferon-gamma, the grafts developed arteriosclerotic lesions. “This observation,” said team member George Tellides, M.D., Ph.D., assistant professor of cardiothoracic surgery, “may improve our ability to develop treatments for arteriosclerosis. Also, we may be able to identify methods to genetically alter pigs to serve as organ donors of hearts resistant to arteriosclerosis.” The study was published in the January 13 issue of *Nature*.

A new twist on protein folding

As disordered, one-dimensional strings of amino acids, proteins cannot carry out their essential work in cells. In order to function, these complex molecules must first fold into stable, three-dimensional structures.

It has long been assumed that proteins must have an oily core to reach a stable configuration. But Donald M. Engelman, Ph.D., professor of molecular biophysics and biochemistry, and Shoen Koide, Ph.D., a collaborator at the University of Rochester Medical Center, have shown that the process can indeed vary. Their findings represent a major shift in the previously standard view of protein folding.

Protein folding is a subject of intense scientific interest, because incorrect folding is a factor in chronic diseases including adult-onset diabetes and Alzheimer's disease. Medical researchers hope to understand protein folding not only to develop diagnostic tools and therapies for diseases



Donald Engelman and a Rochester colleague have shown there's more than one way to fold a protein. Engelman used a small-angle X-ray scattering instrument, pictured here, to measure the size and shape of proteins in solution.

caused by failure of the process, but to understand the information in the genome.

Previously it was believed that proteins organize themselves by first forming a long, stringy polypeptide that then collapses into a compact shape by separating its oily parts from water. At that point, the proteins organize themselves into functional structures.

In an article that appeared in

the January 27 issue of *Nature*, the two scientists reported that they had modified a protein in such a way that it organized itself without use of the hydrophobic, collapsing mechanism. "There is at least one alternative way of folding a protein without this feature that everyone thought was the key," said Engelman. "This is a paradigm shift."

John R. Carlson, Ph.D., professor of molecular, cellular and developmental biology, directed a research group that, for the first time, has identified insect taste receptor genes—nearly 40 for the fruit fly *Drosophila*. The discovery, published in *Science* in March, follows up on Carlson's study detecting insect odor receptors that was published last year. The finding could lead both to a fundamental understanding about the physiology of taste systems and to development of nontoxic compounds to apply to crops, livestock and humans that would taste repulsive to the insects.

Why are we so tasty to bugs? A genetic basis emerges in the lab

Insects devour up to 40 percent of the world's crops and spread disease to hundreds of millions of humans and livestock every year. Controlling pests has proven difficult at best, and current methods often have significant environmental side effects. The discovery of insect taste receptor genes by Yale scientists gives researchers new tools for understanding insect taste systems, and possibly for developing novel means of pest control.

AN AT-HOME TEST FOR

GLAUCOMA

A postdoctoral fellow in ophthalmology, Marcio Marc Abreu, M.D., has designed a new device that allows patients to test themselves at home for glaucoma, an eye disorder which can lead to blindness. Currently, detection of glaucoma requires a visit to the eye doctor. "There is the potential to completely change the way glaucoma is treated, diagnosed and monitored," said Abreu. "The technology allows for a completely automated system without the need for any drops to anesthetize the eye for measurement. And the whole system is affordable."

Abreu's system, which has been licensed to a private company for development, does not require direct contact with the eye, which is necessary for current test procedures. Patients with glaucoma will be able to check their own condition at home as frequently as needed. "The device," said Abreu, "is planned to provide the doctor with a whole history of pressure changes when the patient is not in the doctor's office."

JOB PICTURE BRIGHT FOR

RADIOLOGISTS

Who says managed care is bad for doctors' employment prospects? It's not if you're a radiologist, according to a job market study done by Howard P. Forman, M.D., vice chair of finance and administration in the Department of Diagnostic Radiology, and others. The investigators surveyed positions advertised in professional publications from January 1991 through December 1998. Following a dramatic decrease to a low of 37 advertised positions in July 1995, the market has dramatically rebounded to its highest levels ever, with more than 300 advertised openings by the end of 1998. "Despite decreased reimbursement for exams," said Forman, "there is a substantial increase in total volume, so there is a need to hire more radiologists." The study appeared in April in the *American Journal of Roentgenology*.

PROFILE

BRINGING



Abby Pease, who graduated from Yale College in May, met Matthew Weed two years ago when she volunteered to help prepare his insulin injections. Although she thought it was a crazy idea, Weed, who is blind and severely diabetic, insisted that she teach him inline skating. A year ago the two completed a 26-mile skating marathon in New York City.

SCIENCE *into focus*

Matthew Weed has a unique perspective on the confluence of science, media and public policy.

*By Cathy Shufro
Photographs by Gale Zucker*



In an office two levels below the reference room in the Cushing-Whitney Medical Library, Matthew Weed is reading a copy of *Cell*. He is listening to it, really, with the help of a Macintosh computer and software that converts text into electronic speech. Think of a robot conversing in Portuguese, at quadruple speed, and you'll have a rough idea of what Weed's computer sounds like to the uninitiated. But he understands every word, even as he cranks the program as fast as it will go. Over the course of a year, Weed will absorb 10,000 journal pages in this way, by ear.

His life as a blind (and severely diabetic) third-year graduate student in the Department of Genetics continually presents logistical problems, such as how to follow a discussion about a gene map that he cannot see, how to stay alive while crossing three lanes of traffic on South Frontage Road, and which way to feed a dollar bill into a Coke machine. ("Experimentation is the spice of scientific life," he jokes when the machine spits the bill back at him and he has to try again.)



The technology that translates the written word to the spoken word is Weed's link to scientific literature and much of academia. Unintelligible to the untrained ear because of its speed, his computer's voice program sounds like an audiotape running amok in a foreign language. To hear a sample, point your Web browser to <http://info.med.yale.edu/yymm/media> and select "Bringing Science into Focus" on the contents page.

Without sight, he is sharply aware of the visual basis for communicating ideas in the life sciences. The findings reported in journal articles often depend on evidence found in the charts and photographs accompanying the text, and Weed is constantly working from incomplete information. "Most of the evidence that we generate *could* be represented verbally," he says, "but it's usually represented visually because it can be done more efficiently. It leaves me trying to go back and get the words out of the pictures. I'm not getting the visuals; I'm only getting one stream of information."

Weed's acute sensitivity to missing information has provided the foundation for his academic work: He is studying how missing information about science affects society. His dissertation will explore how key decisions are made in the lab and clinic and attempt to show how findings in the scientific literature are often distorted by the news media—and consequently misunderstood by politicians and the public. "I'm as interested in how society answers its questions as in how science answers its questions," Weed says.

Building on a strong foundation in political science (including his undergraduate degree from Yale and a master's degree from Princeton's Woodrow Wilson School of Public and International Affairs), the 29-year-old Weed will examine how public understanding of science influences funding decisions. Weed says that reporters often make incremental advances sound more definitive—and relevant to human health—than they really are. Reporters suppress what scientists understand implicitly, which is: "This is true in the lab. We don't know yet what we'll see out in the real universe." Weed says that the inaccuracy and distortion common in news coverage of biomedical science can have far-reaching consequences. "Policy and funding decisions are based on what the general public and Congress think," he says, "not necessarily what scientists think."

On a more fundamental level, he is interested in the factors that influence decision-making within the basic sciences and clinical medicine. "In the lab, it could be 'What model organ-

ism does one choose to study a problem?' In the clinic, it could be a case such as the Penn trial," he says, referring to the clinical gene therapy research that resulted in the death last fall of 18-year-old Jesse Gelsinger. "Why did the people doing the work choose an adenovirus as opposed to some other kind of vector? It may have been the only one they could have used. But adenoviruses are known to have fairly severe side effects, and, at dosages high above those in the protocol, those side effects killed the patient. Why were those choices made?"

Weed's advisor in the Department of Genetics is Professor Kenneth K. Kidd, Ph.D., who studies the genetics of complex human disorders and the organization of the human genome—areas that raise ethical issues akin to those that interest Weed. "I've been very involved with these ethical issues in trying to communicate good science to the public," says Kidd, a leader in the fields of molecular and evolutionary genetics, "and that naturally overlaps with a lot of Matt's interests." Weed's dissertation committee includes faculty members from five disciplines, including political science, management and the history of medicine.

Ultimately, Weed hopes to serve as a mediator between scientists and the nonscientists who make public policy. A small, fit man with thinning brown hair and an alert manner, Weed would like to be the commentator journalists call upon to put advances in perspective. He imagines himself on television, say *The NewsHour with Jim Lehrer*, as the expert "who pushes scientists to be truthful in what they say and who also pushes the media to slow down a little bit in the conclusions that they are drawing about the sciences." Weed hopes to advocate for funding decisions based on the promise of research rather than on how well special-interest groups sway people in power.

His sense of politics is well developed, and Weed himself knows how to identify and enlist key players in order to get things done. It was this astuteness that allowed him a decade ago, as an undergraduate at Yale, to radically expand resources available to the blind. Hugh Flick, dean of Yale's Silliman Col-



Weed says his life is more complex, not more difficult, because of his blindness. He relies on volunteers, such as medical student Matthew Kronman, to prepare his insulin (above) and help him make his way (opposite) from classrooms and labs in the Sterling Hall of Medicine to his room in the Harkness dormitory.

lege, recalls that when Weed was admitted to Yale College in 1989, “I think they accepted him expecting he would take advantage of the accommodations Yale had offered [to blind students] in the past, which was mostly Braille and recordings for the blind.”

“HE CHANGED YALE”

Weed was frustrated by the cumbersome process of using audio tapes to “read” textbooks and journals. So in 1990 he and friend Victor Grigorieff, a computer science major, linked an image scanner with software that could convert the print to ASCII text and then to synthesized speech. Weed says that Yale’s willingness to provide the equipment for high-volume scanning made it a pioneer among universities. Scanning texts allowed him to cover material much faster than he could by listening to tapes, and locating quotations and statistics to use in

papers became “infinitely easier.” By persuading faculty members and administrators to help him pursue his academic interests fully, Weed set a precedent that has helped disabled students who have followed. “He changed Yale,” Flick says.

Weed has also enlisted allies to help him manage his diabetes, which can be difficult to accomplish on his own because of his blindness.

He and a coordinator provided by the medical school have assembled a group of student volunteers who monitor Weed’s blood-glucose levels. The students take turns meeting Weed at his dormitory room morning and evening to prepare his twice-a-day insulin injections. (Weed was diagnosed with diabetes when he was a year old and developed glaucoma as a preschooler, possibly as a complication of diabetes. By fifth grade he had lost his vision completely.)

One of the students who has prepared Weed’s insulin over the past several years is Abby Pease, who graduated from Yale College in May. She heard about Weed through Flick and signed on as a volunteer two summers ago because of her interest in medicine. An ice hockey player, Pease commuted on inline skates from the undergraduate campus to Weed’s room at the medical school. One day Weed asked her to teach him to skate. Pease recalls saying, “You’re crazy. I’ll see you later.” But Weed prevailed. They began by practicing in the Payne Whitney Gymnasium, with Pease skating backward while holding Weed’s hands. Pease never thought they would graduate to the rougher terrain of city pavement. But they did, and a year ago a team of students, including Pease, guided Weed through a marathon, skating 26 miles along the streets of Manhattan, to New Jersey through the Lincoln Tunnel, and back to the city over the George Washington Bridge. (Learning to skate was similar to the process Weed went through when, at age 4, he learned to ski in his native Colorado. A few times a year he hits the slopes in Vermont, guided on the novice and intermediate trails by friends who call out voice commands.)

Although Pease found Weed to be patient when he taught her to prepare his insulin, she also thought him brash. (Or as Flick puts it, “He doesn’t suffer fools easily.”) “I think it’s partly who he is and partly because he’s had to fight for what he’s done,” says Pease. “You need to earn his respect. He challenges you. He doesn’t think twice about asking the tough questions.” She has come to value Weed’s intensity. “I really feel like I’ve made a friend for life.”

“everything requires an

Weed's friends and colleagues have learned what kind of help Weed needs. People tell him their names when they say hello in a hallway or join him in the cafeteria. Fellow students at lab meetings help Weed to visualize a graph or chart by guiding his hand along its contours. Friends sort his paper money so he knows a dollar bill from a twenty.

Weed has become increasingly comfortable with this reliance on others, arguing that he is no more dependent than are the people around him—who eat food grown by others, rely on computers they couldn't build themselves, and stay warm by burning oil delivered by tanker. "You are just as dependent on other people as I am, but it's not in your face," he says. He does not consider his life more difficult than the lives of those around him, just more complex. "Everything requires an extra step, or two, or 20. It's not an impossible way of life," he says. "It just requires planning."

A GREAT, INTERESTING JOURNEY

It is a life Weed would not have known without advances in computer technology and the advent of laws requiring accommodations for the disabled. Had he been born just a generation earlier or not had sophisticated parents (a banker, who died when Weed was in college, and a teacher), Weed believes he would have spent his life in an institution. He seems unperturbed by the thought, saying, "We're playing with alternate universe scenarios here. In an alternate universe where I didn't have the resources of a powerful family and technology and the law coming to hand just at the right time, I wouldn't have known what it would be like to have these opportunities."

Weed's mother, Patricia, resembles her son in choosing not to dwell on what might have been, for better or worse. She didn't always see life that way. When her first (and only) child was a very sick infant and his survival was uncertain, she felt tremendous loss—the loss of the life she'd imagined with him. "It was scary. It was not what I had expected." Over time she realized that she had to enjoy the moment without trying to picture the future.



"My life is so much better than I ever could have imagined. At 23, I would not have envisioned the happiness and sense of abundance and joy that we both have," she says. "I'm so grateful that Matthew is part of my life. It's been a great, interesting journey so far."

A high-school French teacher in Colorado Springs, Patricia Weed hears from her son often, sometimes daily. They debate politics and philosophical issues, and work through any problems that arise. "Matt and I have always gone through problem, process, solution. We always go as quickly as possible to solution."

This pragmatic approach and sense of adventure have shaped how Matthew Weed views science. Just as he faces his own limitations head on and solves the problems they present, he embraces the moral dilemmas posed by scientific advances such as genetic engineering and cloning. He acknowledges their dangers, but asks, "Wouldn't it be worse for society to run away from a piece of knowledge just because we fear something bad might happen?" He hopes his perspective will help society to respond to change with courage and clarity of vision. "I can act as society's lens, looking at what we do and why we do it." **YM**

Cathy Shufro is a free-lance writer and a tutor in the Bass Writing Program at Yale. Gale Zucker is a corporate and editorial photographer based in Branford, Conn.

extra step, or two or 20"

TRADITIONS

a match

made in

● NEW HAVEN

Finding the right residency requires stamina, endurance and a high tolerance for airline food (not to mention anxiety). If you thought the process leading to Match Day was a challenge, imagine doing it as a couple.

By John Curtis

Photographs by Gale Zucker



A letter in a mailbox ends an anxiety-ridden journey that starts months before as medical students struggle to find the right residency. Tanya Smith and Jose Prince, who met in their first year of medical school, complicated their search by matching as a couple.

Along with 14,356 other fourth-year medical students in the United States, Tanya Smith and Jose Prince took time off from school this winter to make one of the most important, and long-lasting, decisions of their careers—choosing a residency. Because they will spend the next few years of their lives learning their specialties, they wanted programs that would offer the best training possible with top faculty. They also stirred into the blend personal considerations such as geography and lifestyle. Then they further complicated the mix—they applied as a couple.

That meant they would have to find medical centers with strong programs in obstetrics and gynecology, as well as surgery, the specialties Smith and Prince are pursuing. They would have to agree not only on a list of up to 20 programs they found desirable, but rank them in the same order of preference. Then, one of those programs would have to accept both of them.

In the 48 years since the National Resident Matching Program began pairing residency programs and newly graduated physicians, much has changed. Applications are filed electronically, rather than on paper. Applicants get their first view of programs on the Internet rather than in a brochure or on a campus tour. Applicants are increasingly likely to be women and more likely to marry other physicians. Although the Match has always tried to keep couples together, in the early 1980s a new computing algorithm for couples formalized the process. This year, according to the NRMP, 508 couples entered the match and 475, or 95.3 percent, were successful.

But it's not easy. Between Dec. 3, 1999, and Feb. 4, 2000, Smith and Prince visited a total of 38 residency programs. Smith started at the University of Connecticut, flew to North Carolina the next day, then returned to Hartford for a three-hour layover before catching a plane to St. Louis. From there she flew to Michigan, interviewed in Ann Arbor and returned to Connecticut. She had interviews on Dec. 9, 10, 13, 15, 17 and 18 and Jan. 3, 4, 7, 8, 10 and 29.

Prince drove to Boston three times, crossed the country twice and racked up more than 20,000 travel miles. "You end up flying into one place," said Prince, "then immediately flying out to another place." He once left his parents' home in New York City at 3:30 a.m. to drive to Pittsburgh and save on lodging. He managed to avoid hotels throughout his interview marathon by staying with friends. In early February he spent his first night in New Haven in six weeks.

INCREASING THE ODDS

Smith and Prince, who met in their first year of medical school (they were elected co-presidents of their class), hedged their bets when matching. Instead of the dozen applications a single student might make, Smith applied to 30 medical centers and Prince to 25 before they narrowed their choices. By Jan. 29 the traveling was over for Smith and she turned her attention to completing her thesis. Prince finished his interviews on Feb. 4, at Yale. But the hard part lay ahead—considering their choices and making a priority list. "We agreed on number one, but couldn't agree on two, three, four and five," Smith said. "We tried to come up with the best combinations so that one of us wouldn't have to compromise."

Both decided in their undergraduate years to become doctors. Prince, whose 90-year-old grandfather retired as a pediatrician in Cuba just four years ago, said he'd always enjoyed science and believed medicine "was a wonderful way of spending my life, helping other people." As an undergraduate at Georgetown University he majored in biology. Smith, also a biology major, originally planned on becoming a pediatrician and spent the year following her graduation from the University of California at Berkeley doing research in a children's hospital. In medical school her interest shifted to obstetrics and gynecology. Both she and Prince took a fifth year to complete their medical studies. Smith worked in a lab studying breast cancer, where she co-authored a paper on the genetic basis of the disease that was published last year in the *Journal of Clinical Oncology*. Prince spent a year doing basic science research on diabetes at the National Institutes of Health.



Cynthia Andrien, assistant dean of student affairs, and Nancy Angoff (right), associate dean of student affairs, carry the letters to the mailroom.



The moment of truth comes in the mailroom at Harkness Hall as (from left) Melissa Wolfe, Arvind Venkat and Amy Nuernberg open their letters.

As they investigated residency programs, they looked for more than good training. Just as it is for many in today's workforce, lifestyle is an important factor for medical students. They want a program that will allow them to become highly skilled. Reputation is important, as is stability. Given the volatile finances of academic medicine in recent years, they want to be certain the program will last. Single students may prefer large cities, where they have a better chance to make another kind of match. Some students avoid programs with reputations as "boot camps." Others may want to be near family or otherwise ensure that the program is in a desirable place to live. Both Smith, who grew up in the Bay Area of California, and Prince, from New York City, were under pressure to be near their families.

"The thing everyone is looking for is a place with a strong reputation in whatever field it is that you're in," Prince said. "The most important thing for me," says Smith, "is a place where I can fit in, get very good clinical training and that will give me options for the future."

This is perhaps a lot to ask for, but at Yale most students match to one of their top choices. According to Cynthia Andrien, assistant dean of student affairs, 90 percent of this year's class matched at one of their first three choices, and 94 percent got one of their top five. Nationwide, about 86 percent of the more than 20,000 U.S. and foreign medical students who applied matched to one of their top three choices at 3,769 residency programs in the country.

STREAMLINING THE PROCESS

The Match began in 1952, an answer to the frustrations of medical students who too often felt pressured to take a bird in the hand. Programs offered positions and demanded immediate acceptances before students knew all their options. The Match ensured that everyone learned where they had been accepted on the same day, the third Thursday in March.

At Yale the process starts in the third year of medical school with faculty-led workshops describing the process and preparing students for interviews. It ends almost a year later when students open the letters that tell them where they've been accepted. Those letters are final. Upon entering The Match, students agree to abide by its decision. "If you make the wrong call and end up at the wrong place, it's a big chunk of time," says Prince.

Making the perfect match begins and ends on the Internet. Smith and Prince started with tours of Web sites, and by the Nov. 19 application deadline they had narrowed their choices. Like most Yale medical students, they filed their applications electronically, submitting them on computer disk to the Office of Student Affairs, which added deans' letters and supporting documents to the file.

One thing hasn't changed in the electronic age. Applicants still have to travel to interviews that afford them a chance both to make a good impression and take a look at residency programs. Along the interview trail they run into the same people again and again. First viewing them as competitors, Prince and Smith began to see their peers as future colleagues and friends. "You think, 'I hope I end up with this guy because he will be

fun to work with,” Prince said, adding that he kept in touch with his new acquaintances by e-mail and often made dinner dates at future interview locations. New friends on the trail also provided information they couldn’t get elsewhere. “They were one of the most valuable resources,” Smith said. “They had been to the same places as I had been, but had different impressions or met a different faculty member.”

Medical students and residents provided a fuller picture of each program. “People are so eager to tell you about the positive components of their program and they are very slow about telling you their faults. Caveat emptor,” says Prince. “It’s usually a red flag if you don’t get to meet the residents.”

Interviews followed a pattern—an introduction and orientation over coffee and donuts, a round of three or four interviews, lunch and a tour. Some interviewers were familiar with his resume, said Prince, while others appeared to be leafing through it for the first time. The first set of interviews in December was daunting, he said. By February the trick was to answer a question for the umpteenth time without sounding rehearsed.

With interviews over, the Match’s final deadline loomed in February. By 11:59 p.m. on Feb. 16, Smith and Prince had to log onto the NRMP’s Web server and submit their list of choices, in order of priority. Number one on their list was the University Health Center in Pittsburgh.

THE MATCH

The day of reckoning arrived on March 16. Assistant Dean Andrien, accompanied by Nancy R. Angoff, M.P.H. ’81, M.D. ’90, HS ’93, associate dean of student affairs, carried a stack of about 100 letters to the ground-floor mailroom at Harkness Hall. Ignoring the eager and expectant faces around her,



Jody Levine celebrates with one of her two children.

Andrien closed the mailroom door and began placing letters in slots. Outside, the tension was growing. “You could not pay me enough to relive this week,” said Megan Lisska, who, along with her boyfriend, Matthew Falk, had sought a pediatrics residency. They weren’t matching as a couple, as Prince and Smith had done, so there was a chance they would end up apart. “This process is brutal,” said Lisska.

Prince arrived, gave Smith a hug, and the two went off to find their friends. Along with their classmates, they had been relieved to learn on Monday that they had avoided The Scramble. Although most Yale medical students get one of their first choices, the occasional few fail to match anywhere. They may have chosen only the top programs in highly competitive specialties, or they may have decided not to include a safe program on their list and been unpleasantly surprised. The Scramble is a last-minute race to find a residency slot. Students may opt to spend a year doing research or accept a preliminary residency for a year before trying again.

A few minutes before noon, an over-eager student popped his head into the mailroom. He was shooed out. “I have 11:59,” said Angoff with a mock frown, as she and Andrien slipped letters in mail slots. Then she laughed. “OK,” Andrien said. “Let the craziness begin.”

The students started streaming in. Some were in tears before they even got to their mail slots. Others held hands with friends. Some ripped open their letters and started cheering. Others left the mailroom with their letters unopened.

Lisska and Falk had reason to celebrate. They both would be going to Stanford University in California. “We got our first choice,” Lisska said.

This year’s class continued a trend away from specialties and towards some form of general medicine. About two-thirds of the students chose residencies in internal medicine, primary care, pediatrics or obstetrics and gynecology. Programs in Boston drew the most students in this class, 21, followed by New York City, where 17 students found residencies. Sixteen students chose to stay in New Haven for residencies at Yale-New Haven Hospital. (For a complete list of placements, see page 42.)

Outside the mailroom, Smith and Prince were celebrating their joint acceptances at University Medical Center in Pittsburgh, their first choice. “It’ll be a great place for us,” Prince said. “The professors are down to earth. They have a good sense of balance between work and play.” Tanya nodded, tears in her eyes. “I’m so happy,” she said. **YM**

John Curtis is the associate editor of *Yale Medicine*. Pem McNerney, a free-lance writer in Connecticut, contributed to this article. Gale Zucker is a corporate and editorial photographer based in Branford, Conn.



● PITTSBURGH

A happy ending for Smith and Prince as a match made in New Haven leads to their first choice—Pittsburgh.

THE INS AND OUTS OF

international

A new Yale clinic guides parents and pediatricians through the complicated terrain of adopting abroad.

By Sandra J. Ackerman

Photographs by Robert Lisak

When parents bring their young children to the International Adoption Clinic at Yale, they arrive with questions, often by the dozen. When will my child begin walking? Is his eating normal? Is this behavior normal for her age? Are his size and weight within range? Some of the questions are typical of any routine visit to the pediatrician; others could only be posed by families that have adopted from overseas. Underlying all of them is one fundamental concern: Will my child be normal and healthy?

If having a baby opens an ordinary Pandora's box of questions and concerns, then adopting a child from another country opens an even larger one. In addition to the normal adjustments of parenthood, parents who adopt from abroad must take into account the social and cultural heritage of their child's homeland, along with any medical issues that are specific to that country. For pediatricians, these questions have arisen more and more frequently. In 1992 the U.S. Department of State counted 6,536 international adoptions; by 1997 the number had more than doubled, to 13,620. According to the Joint Council on International Children's Services, 16,396 children were adopted from abroad by U.S. parents in 1999. This small but growing population of young patients brings with it some unfamiliar medical challenges, ranging from iodine deficiency to incomplete vaccination records and obsolete screening tests.

Georgeta Coleman, 2, arrived from Eastern Europe in May and visited the Yale International Adoption Clinic shortly thereafter. During their evaluation physicians found Georgeta to be in good health, despite a common intestinal parasite and slight developmental delays. "She's doing just fine," says her mother, Mary Ellen Coleman.



adoption



“In some cases there has to be an unlearning that takes place before the child can go forward.”



Margaret Hostetter, left, the clinic's director, and colleagues are at work on a study that will track adopted children well into the future to identify factors that may lead to developmental problems.

Since its formation in 1998, the Yale clinic has offered new resources to pediatricians and adoptive families throughout Connecticut and parts of New York. Led by Margaret K. Hostetter, M.D., professor of pediatrics, the Yale International Adoption Clinic combines up-to-date tracking of diseases that are common outside the United States with a thorough understanding of how a child's previous living situation and care may affect his or her physical, mental and emotional development.

“Development is not like a clock that just slows down in difficult circumstances. In some cases there has to be an unlearning that takes place before the child can go forward,” says Hostetter's colleague Carol Cohen Weitzman, M.D., an assistant professor of pediatrics who specializes in developmental and behavioral issues.

Parents who come to this clinic, like any parents of young children, have at least as many questions about their children's behavior as about their general health. Often, however, they raise issues that rarely crop up in general pediatrics in this country. For example, if the child hoards food in his room or hides it throughout the house (a habit often seen in older children coming from orphanages), that may actually be a reasonable but misplaced response to a scarcity of food sometime in his past. As the child learns to trust his parents to provide enough food every day, the hoarding may gradually stop. “It's a matter of teasing out what's normal growth and development from what has to do with the fact that the child has come from adverse circumstances,” says Betsy Groth, A.P.R.N., a nurse practitioner in the clinic.

“A parent may ask, ‘My two-year-old is saying ‘no’ all the time. Does it have anything to do with her upbringing in China?’” says Groth. “I tell the parent, ‘Well, no, it's because she's a two-year-old.’ But if someone asks, ‘Do you think it's normal that a three-year-old wouldn't try to feed himself at all?’ I would say, ‘That isn't normal, but it may have been appropriate in an orphanage where the children were always fed by the staff and not encouraged to feed themselves because that would have been too slow and messy.’”

STANDARDS OF CARE

Based on the second floor of Yale-New Haven Children's Hospital, the Yale International Adoption Clinic practices pediatrics at a pace rarely seen since the advent of managed care. Three or four appointments make for a full morning, and the routine allows for plenty of discussion between clinicians and families. Clinic director Hostetter is thoroughly familiar with the requirements of this specialized medical field—in fact she is one of the founders of the field, having worked with Dana Johnson, M.D., Ph.D., to establish the country's first international adoption clinic, at the University of Minnesota, in 1986.

be an unlearning can go forward.”

She and Johnson, together with several colleagues, published a 1989 paper titled “International Adoption: An Introduction for Physicians” and a later paper on unexpected medical diagnoses that emerged when internationally adopted children received their first medical evaluations in the United States. In 1992, when the surge of adoptions of Romanian children was at its height, Hostetter, Johnson and others published a case series of 65 Romanian orphans who had been brought to the United States for adoption in the previous year. They found high rates of hepatitis B, intestinal parasites and developmental retardation, leading them to the sad conclusion that Romanian adoptees at that time were “an extraordinarily high-risk pediatric group as a consequence of government-sanctioned child neglect and abuse.” They also developed a list of seven essential screening tests, which the American Academy of Pediatrics endorsed in 1991 as the standard of care for adoptees.

ASSESSING THE RISK

Two years ago, with the Minnesota clinic well established as a center of both treatment and consultation for internationally adopted children, Hostetter was recruited to launch a similar clinic at the School of Medicine. Here, she and Michael Cappello, M.D., associate professor of pediatrics (infectious diseases) and of epidemiology, carry out a careful physical exam of each child who comes to the clinic, while Weitzman evaluates the children for possible developmental problems and Groth handles the medical history and general information intake.

The clinic currently sees patients one morning each week, for a total of about 10 to 12 children per month. Hostetter also leads a collaborative group of seven basic investigators and their laboratory staffs at the Yale Child Health Research Center and heads up the Department of Pediatrics immunology section. She also serves on the National Advisory Child Health and Human Development Council, the principal advisory body of the National Institute of Child Health and Human Development.



Children adopted overseas, says Carol Weitzman, often don't fit into traditional patterns of American babies. Each child will adapt at his or her own pace.

“Should an orphanage stay of more Are the children of one country



Michael Cappello sees himself and his colleagues as a resource to other doctors. “Our role should not be to supplant the community physicians,” he says. “We want to supplement them.”

Together with her colleagues at the Yale clinic, Hostetter continues to investigate issues that have proved central to international adoption. Says Weitzman, “We’d really like to find out who are the children having difficulties and which factors tend to be associated with these difficulties.” To that end, she and Hostetter have designed a small study to follow a group of internationally adopted children at six-month intervals far into the future. Seeking to identify good predictors of risk for developmental problems, the study will collect any available details of the child’s life before adoption and assess the child’s development, his level of social and emotional organization, and his relationship with his adoptive family. It will also assess physical growth, language development, behavior and issues of adjustment in the family.

If this preliminary project goes well, Hostetter and Weitzman plan to follow it with a larger one that would combine the efforts of six other major international-adoption clinics to study some 500 children all over the country. “Again, the idea would be to try to pinpoint, by statistical analysis, some of the factors that seem to predict developmental problems,” says Hostetter. “Should an orphanage stay of more than two years be a red flag? Are males more at risk for certain problems than females? Are the children of one country more at risk than those of another? We’re particularly interested in factors that can vary within one country of origin—for instance, if we were to find that, of all the children coming from Romania, the only ones with normal development are those from foster homes, this could have important implications for Romania’s policies on the care of orphans and also for people who are considering adopting from Romania.”

than two years be a red flag? more at risk than those of another?"



Behavior as well as health issues concern parents who bring their children to the adoption clinic. "It's a matter of teasing out what's normal growth and development," says nurse practitioner Betsy Groth, "from what has to do with the fact that the child has come from adverse circumstances."

A SPECIALIZED ROUTINE

Even though a typical appointment at the Yale International Adoption Clinic includes a standard pediatric exam, the focus is always on the specialized medical issues that go along with international adoption. Cappello, who shares the disease-screening procedure with Hostetter, sees himself and his colleagues as consultants, offering a new resource to the many primary-care physicians in the area. "We feel very strongly that our role should not be to supplant the community physicians—we want to supplement them instead," he says.

For each young patient, the file will hold any medical records, however scant, that have accompanied the child from his native country; information about the birth mother that may hold medical significance (e.g., age, prenatal care received, number of previous pregnancies, any indications of substance abuse); and a full history of any recent symptoms. The Yale physicians give the child a thorough physical exam, checking

for conditions that are common all over the world among people who have lived in institutions: lice, scabies, rickets and infectious diseases. And they look very carefully for signs of fetal alcohol syndrome— "a particularly difficult diagnosis to make," says Cappello, "because it's a syndrome with a wide range of severity rather than a disease [that can be diagnosed] with a simple yes-or-no test."

The exam concludes with screening tests to detect ailments ranging from hepatitis B and C to tuberculosis, HIV and excessive lead levels. "For the most part, the countries we see children from are doing tests to the best of their ability," Hostetter says, but sometimes that ability does not match current American standards. For example, tests for hepatitis B, if improperly performed, can give a false-negative result. Hostetter estimates that this happens in 6 to 10 percent of cases. "It's a tough test to do because it has a number of steps and the result requires a special calculation in order to read it correctly," she explains. To be safe, therefore, the Yale clinic tests again for hepatitis B. Likewise, children coming from Russia often show a record of having been tested for syphilis, but Hostetter prefers to test them again because the standard Russian method, the Wasserman test, which dates back to 1906, has a false-negative rate of about 5 percent. Newer tests (RPR and VDRL) are more reliable.

Intake information and medical history are handled by Groth, who says, "My session with an international adoptive family is an adaptation of what I would do during any well-child visit. I am always concerned with what the parents' questions are. In this clinic I concentrate a little more on eating, digestion and nutrition."

IN A GRAY ZONE

The focus of Weitzman's exam is on the child's development, adjustment and emotional well-being. She says, "From my own observation I note whether the child is very clingy or is having difficulty letting anyone touch him, and whether he is able to seek out physical comfort or soothing when distressed. And I look at the early attachment relationship between the child and the parents. Does the child preferentially look to the parents, then to me? Do parents and child appear comfortable with each other? In other words, is this relationship taking a healthy turn?"

Weitzman's questions point toward an important principle of international-adoption medicine: These children do not fit the pattern of American babies to begin with, and each individual can only grow into that pattern at his or her own pace. "You can't use normative standards—not at first," Weitzman emphasizes. She goes on, "Of course, this leaves you in a gray zone. When is it okay to say, 'This child needs a little more time (to experiment with walking and running, to be willing to sleep in a room by himself, to start speaking English, to understand that this is his permanent family),' and when should we recommend counseling or early intervention?"

Such a recommendation from the clinic can be an important guide for adoptive families in getting their child the help he or she needs. It is also a fairly common matter since, as Hostetter, Johnson and several colleagues found in a 1997 study of children adopted from Eastern Europe and the former Soviet Union, a child's growth and development are delayed by one month for every three to five months he or she lived in an orphanage. Thus, a child brought home from an orphanage abroad at 12 months may seem more like a 9-month-old American baby, and a child adopted from an orphanage at age two may look, act, and think more like an American 18-month-old. Nevertheless, some parents struggle with the idea that their child may need special attention. "A lot of families want to believe that that part of the child's life is all gone once they get her home," says Weitzman. Of all the families who come to the clinic, she sees about one-fourth for follow-up care. She says, "I try to help these families understand what they may be facing—and also to give them a break, to let them realize that with all their love and care there may still be phases where their child needs additional services to help her catch up or to deal with the effects of early trauma or deprivation."

Jerri Jenista, M.D., a longtime colleague of Hostetter now on the faculty at the University of Michigan, takes a similar realistic stance. "We would not expect to adopt a child in the United States without any issues," she says, "so why should we expect a child from another country to come without any issues?" The most important step that adoptive parents can take to help their new child, even before they bring him home, is to gather plenty of information, both about the experience of adoption in general and about conditions that may have



When Dianna Piazza returned from China in April with Nancirose, 2, her adoption agency recommended she have a specialized checkup and developmental assessment. Nancirose, Piazza says, is thriving. "She's a typical 2-year-old with a mind of her own."

affected their child's health in his country of origin. At Yale, the staff of the International Adoption Clinic likes to serve as a major resource for information. "I feel very strongly that good preparation beforehand is essential," says Groth, herself the adoptive mother of a boy and a girl from Korea. If the family has not been well prepared by the time they arrive at the clinic with their child, she says, "It's still possible to steer them toward sources of information—at least to advocacy groups or to support groups so they can meet with other adoptive parents and exchange their stories."

Sharing experiences, information and helpful tips with other adoptive parents can certainly help with the day-to-day management of a family situation that can be as challenging as it is joyful. But there is one key piece of information that is best delivered by the international adoption clinic, even though adoptive parents may have known it for some time. In Weitzman's words, "By far the most important intervention for these children is being placed with a family that loves them and pays attention to them." **YM**

Sandra J. Ackerman is a free-lance medical writer in Durham, North Carolina. She and her husband recently adopted a baby girl from Russia who is now thriving, they report, thanks in part to the excellent care she has received at the Duke International Adoption Clinic. Robert Lisak is a photographer based in New Haven, Conn.



the not-yet-home movie: A MEDICAL DOCUMENT

The “referral” videos, key elements in the packet of information sent to prospective adoptive parents about a particular child, may be some of the most closely watched films in the world. No aspiring filmmaker could outdo a family-in-waiting when it comes to microscopic, frame-by-frame scrutiny of a referral video—all two or three minutes of it. When my husband and I finally received our referral video from Russia after many months’ wait, we both dropped work for the day and sat down to meet our new daughter. Like most families in this situation, we played and replayed the brief encounter, searching for signs that this small, faraway person might one day feel at home with us. We felt inexplicably relieved when we noticed that the baby in the video not only looked bright and healthy, but also happened to have the same cleft chin sported by my husband, his mother and all their forebears.

The other, equally important audience for the referral video is a physician who knows how to read it as a medical document. Margaret K. Hostetter, M.D., director of the Yale International Adoption Clinic, has seen hundreds of referral videos, both in preplacement evaluations for families that will later come to the Yale clinic with their new child and in consultations for families all across the country who seek an expert opinion. “An informative video, made to show what the baby

can do, can be encompassed in two to three minutes,” she says.

Colleague Carol Cohen Weitzman, M.D., describes the range of criteria that are used to assess several important areas of a child’s development. Often children who have been in institutional care will show some evidence of developmental delay on these brief videos.

According to Weitzman, the criteria that are assessed include:

Gross motor skills “We assess a child for the normal unfolding of motor milestones as a child develops increasing strength, flexibility of movement and mobility,” says Weitzman. “We look for the presence of unusual or atypical movements, and assess a child for excessive weakness or stiffness.”

Fine motor skills “A child should increasingly develop the ability to manipulate objects and explore their environment with growing precision,” she says. “We assess if this is happening in a predictable way or if there is deviation.”

Language development “Children should make a range of sounds, and the complexity of the sounds should increase with time. Children should show evidence that they are hearing the sounds in their environment and responding to these sounds and words. We assess how children are communicating their needs to others and whether they are invested in communicating with others.”

Cognitive development “As children grow, they should develop an increasingly complex repertoire of problem solving skills — from mouthing and banging objects to testing cause-and-effect “theories.” We assess whether children demonstrate a curiosity to explore, any novel exploration of materials and their ability to imitate others’ actions.”

Social development “Children should be invested in human relationships. We look for evidence of their desire to interact with others and gain satisfaction from a human relationship. This would include assessing children’s ability to make eye contact, to gesture to others and to seek caregivers out for pleasure and comfort in times of distress. Ideally, we would like to assess whether the child is developing discrimination in their relationships.”



Before traveling to Russia, author Sandra Ackerman and her husband viewed this video of the girl they would later adopt.

FACULTY NEWS

Janeway elected to NAS

Charles A. Janeway, Jr., M.D., professor of immunobiology, biology and dermatology, was elected to the National Academy of Sciences during its annual meeting in May, for distinguished and continued achievements in original research. Janeway is known for both his theoretical insights in understanding immune responses and his experimental skills and was first to advocate that new thought be given to the role of inherited defense against common microorganisms. Janeway theorized that innate immunity is the body's first line of defense against infection before the body's adaptive immune system takes up the battle.

Janeway, co-author of one of the leading textbooks in immunology, recently attended his daughter's graduation from medical school, making her the fifth consecutive generation in his family to enter medicine.

Doudna receives Waterman Award

Jennifer A. Doudna, Ph.D., professor of molecular biophysics and biochemistry, whose leading work in structural biology provided an answer to how RNA can act like an enzyme, has been awarded the Alan T. Waterman Award from the National Science Foundation.

The award, instituted by Congress, is made each year to an outstanding scientist or engineer, 35 or younger, and includes a grant of \$500,000 over three years for scientific research or advanced study in any field of science. She is the 25th recipient of the award, established in 1976, and only the third woman to be so honored.

Her work explains how RNA can act like an enzyme to catalyze specific biochemical reactions and how polyanionic RNA forms a three-dimensional structure. Doudna's most recent work has to do with the structure of the signal recognition particle, showing how this recognition takes place on a molecular level (see page 16).

A colleague who nominated Doudna for the award, Professor Joan Steitz, also of the Department of Molecular Biophysics and Biochemistry, said, "There can be no question that her pioneering accomplishments have changed the way the scientific community thinks about RNA molecules. Such exceptional achievements are precisely what the Waterman Award was created to recognize."

Doudna's laboratory is continuing to build on the RNA research, focusing on two questions: how RNA played a role in evolution, and what can be learned about how life evolved by looking at RNA protein machines that exist in modern biology.

School of Medicine faculty elected to CASE

The Connecticut Academy of Science and Engineering recently announced the election of new members, including several faculty members.

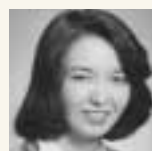


Gabor Huszar, M.D., senior research scientist in the Department of Obstetrics and Gynecology;

Sally E. Shaywitz, M.D., professor of pediatrics and pediatric neurology; and **John F. Tallman, Ph.D.**, associate professor adjunct of psychiatry at Yale and executive vice president and scientific director of Neurogen Corporation.

Joseph S. Fruton, Ph.D., the Eugene Higgins Professor Emeritus of Biochemistry and senior research scholar in the history of medicine received the 1999 Association of American Publishers Professional/Scholarly Publishing Award in the History of Science and Technology for his book *Proteins, Enzymes, Genes: The Interplay of Chemistry and Biology*. The book was published by Yale University Press in 1999.

Patricia S. Goldman-Rakic, Ph.D., professor of neurobiology, neurology and psychiatry, was awarded a degree of doctor honoris causa in biology, in March, from the University of Utrecht, the Netherlands.



Fuki M. Hisama, M.D., assistant professor of neurology,

received the Paul Beeson Physician Faculty Scholar in

Aging Research Award from the American Federation for Aging Research in April. The award provides \$450,000 in research funding over three years to outstanding junior physician faculty committed to academic careers in aging-related research, teaching and practice. The focus of Hisama's research is Werner syndrome. People with this syndrome begin to age rapidly in their late teens and early 20s. The disease, named for the German physician Otto Werner, is rare and caused by a mutation in a single gene.



Frederic L. Holmes, Ph.D., Avalon Professor and chair of the

Section of History of Medicine, was elected one of 47 new members of the American Philosophical Society (APS), at its annual general meeting held in Philadelphia in April. Founded by Benjamin Franklin in 1743, the APS is the oldest learned society in the United States devoted to the advancement of scientific and scholarly inquiry. Holmes has written six books and countless articles in which he explores how major discoveries are made. "Knowledge is cumulative," he said, noting that all research depends on what came before.



Marina A. Picciotto, Ph.D., assistant professor of psychiatry and pharmacology, was one of

60 young researchers present-

NEW BOOKS

ed the Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the United States government to young professionals at the outset of their independent research careers. The annual awards, established by President Clinton in February 1996, were presented in April in a White House ceremony. Picciotto received the award for research that identified a molecular receptor in the brain that is believed to be responsible for nicotine addiction.



Albert J. Solnit, M.D., has retired after nine years as commissioner of Connecticut's Department of Mental Health and Addiction Services, but he remains active. Gov. John Rowland has appointed him chair of a commission that is examining the state's mental health services. Solnit also continues to work in the Yale Child Study Center, where he teaches, sees patients and conducts research. "As you get older, work is a good friend," says Solnit, Sterling Professor Emeritus of Pediatrics. "You may get tired, but you won't be lonely."

The Stolwijk Fellowship has been established in honor of



Jan A.J. Stolwijk, Ph.D., professor emeritus and former chair of the Department of Epidemiology and Public Health. Each year up to three fellowships of \$2,500 will be awarded to students

completing their first full year in the master's program in public health.

Robert I. White, M.D., professor and past chair of the Department of Diagnostic Radiology, received a 2000 Gold Medal Award from the Society of Cardiovascular and Interventional Radiology. White, director of the Cardiovascular Diagnostic Laboratories at Johns Hopkins University Hospital for 17 years, led the development of therapies for two congenital heart diseases: pulmonary valvular stenosis and aortic coarctation.

Edward F. Zigler, Ph.D., who is Sterling Professor of Psychology and has an appointment in the Yale Child Study Center, received two major awards this year. In February he received an unrestricted \$250,000 award from the Heinz Family Foundation for his contributions in the area of public policy. And in June he was named the first recipient of the Early Childhood Leadership Award from the A.L. Mailman Family Foundation. The award is accompanied by a \$50,000 grant. Zigler has dedicated more than 30 years to the development of sound programs for at-risk children, among them the Head Start program and family-leave policies. In 1970 he became the first director of the U.S. Office of Child Development (now the Administration for Children, Youth and Families). Zigler also helped write the first child-abuse law in 1974.

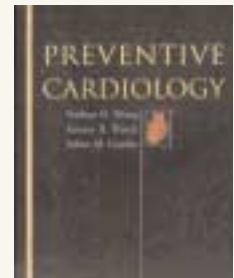
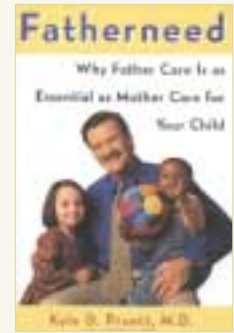
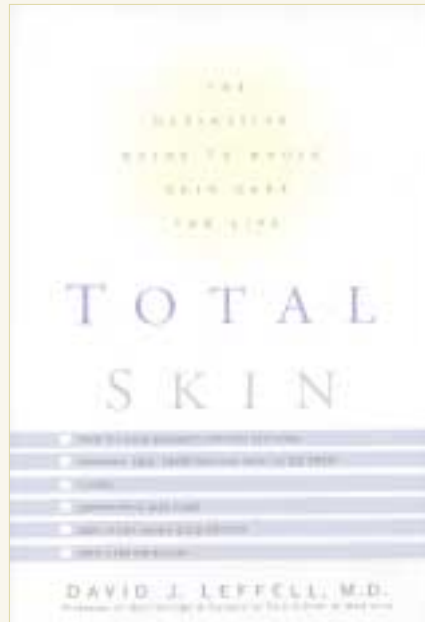
Total Skin: The Definitive Guide to Whole Skin Care for Life, by David J. Leffell, M.D., professor of dermatology and surgery, Hyperion Books (N.Y.), 2000.

Fatherneed: Why Father Care is as Essential as Mother Care for Your Child, by Kyle D. Pruett, M.D., clinical professor of psychiatry in the Child Study Center, Free Press (N.Y.), 2000.

Preventive Cardiology, edited by Nathan D. Wong, M.P.H. '87, Henry R. Black, M.D., HS '75, and Julius M. Gardin, M.D., McGraw Hill (N.Y.), 1999.

Pursuing Perfection: People, Groups and Society, by the late Leonard W. Doob, Sterling Professor Emeritus of Psychology, Praeger Publishing (Conn.), 1999.

Foundations of Anesthesia: Basic and Clinical Sciences, by Hugh C. Hemmings Jr., M.D. '87, and Phil M. Hopkins, Mosby (London), 1999.



Historical Landmarks in Head and Neck Cancer Surgery, by Donald P. Shedd, M.D. '46, American Society for Head and Neck Surgery (Penn.), 2000.

Surgery Clinical Companion, by Christopher P. Coppola, M.D., HS '00, and Seth A. Spector, M.D., HS '00, Lippincott, Williams & Wilkins (Md.), 1999.

NOTICES OF NEW BOOKS BY ALUMNI AND FACULTY MAY BE SENT TO CHERYL VIOLANTE, YALE MEDICINE PUBLICATIONS, P.O. BOX 7612, NEW HAVEN, CT 06519-0612.

Celebrating



MELANIE STENGEL (2)

Top: John Forrest (left), Dean David Kessler (right), and speaker Harold Varmus (center), former head of the National Institutes of Health, joined presenters Max Kelz, Elizabeth Harrold, Hanna Kim, Aaron Milstone and John Coombes

Above: John Mahoney explained his research project, *Proximal Pole Scaphoid Fractures: Arthroscopic Reduction and Dorsal Percutaneous Cannulated Screw Fixation*, to Gerard Burrow.

At Student Research Day, a primer on the scientific method

When medical student Edwin Anderson of Wilmington, N.C., wrote his Yale thesis in 1837, he would not have expected it to generate excitement a century and a half later. Bearing the Latin title *De Calculo Vesicae*, Anderson's treatise on bladder stones made its case in 155 pages and 40 chapters and contained two pages of references, not unusual for its day. What set it apart 152 years later was its discovery among the archives by a professor tracing the roots of student research at Yale.

The professor, John Forrest, M.D. '67, came across the slim volume in 1989 while preparing remarks for the 150th anniversary of the thesis requirement, first documented in the medical school *Bulletin* in 1839. (Anderson's work, the earliest bound thesis that has been located, is among a handful known to pre-date the requirement; the earliest was written in 1823.)

student research

In early May, Forrest brought Anderson's work to Student Research Day, the annual celebration of scientific inquiry by students. What began in 1987 as a yearly poster session has become one of the brightest days on the academic calendar. It is also an opportunity for medical students to sit at the feet of leading figures in science and medicine who visit under the auspices of the Lee E. Farr, M.D. '33, Lectureship. This year, Nobel laureate and former NIH Director Harold Varmus delivered a talk entitled "Genes and Cancer: The Quest Continues."

Forrest told students and faculty who gathered to hear presentations of five outstanding works that "the value of the thesis is to teach that all physicians are scientists. It is a way," he said, "to help ensure that Yale medical students learn the scientific method from the inside out."

Graduate research conference links students across campus

With 100 posters on display and 370 registrants, this year's Graduate Student Research Symposium on May 4 and 5 achieved the greatest participation in its five-year history. For the first time, the symposium was open to submissions by post-doctoral fellows as well as graduate students. Faculty members led mini-symposia in each of 10 research categories.

"We modeled it like a national conference," said Shilpa Patel, who organized the conference with fellow pharmacology student Helen Seow. In a break from past years, posters were organized by interdisciplinary topics and presenters discussed their particular disciplines during poster mini-symposia. This allowed researchers to break out of their specialties and meet others at Yale who are working on a different aspects of common fields, Patel said. "Yale is a very collaborative environment to do science," she added.

The event also featured talks by Nobel laureate Günter Blobel, M.D., Ph.D., and MIT biology professor Harvey Lodish, Ph.D. Lodish studies two classes of membrane proteins: transporters which move nutrients into and out of cells, and receptors which bind chemical signaling molecules in the environment of a cell and transmit these signals to the cell's interior.

Blobel, a cell and molecular biologist at Rockefeller University, won the 1999 Nobel Prize in physiology or medicine for his discovery that proteins have intrinsic signals that govern their transport and localization in the cell. During the symposium he gave the first George Palade Lecture, sponsored by the Department of Cell Biology in conjunction with the GSRS. The lecture honors Palade, the founder of the section of cell biology. Palade, himself a Nobel laureate in 1974, introduced Blobel via videotape from his home in California. In his talk, Blobel discussed the research that led to his discovery about signals in protein transport. He began in the 1970s by finding the signal that guides newly synthesized proteins through the membrane of the endoplasmic reticulum. "What wasn't known were the molecular mechanisms by which this pathway operated," Blobel said. His pursuit of an answer to this question led to his subsequent discoveries.



JOHN CURTIS

Cell biology chair Pietro De Camilli (left) and James Jamieson, (right) director of the M.D./Ph.D. program, joined Nobel laureate Günter Blobel before his talk, offered in conjunction with the Graduate Student Research Symposium.

Class of 2000 takes to the generalist disciplines

As went the nation, so went the Class of 2000 on Match Day this year, with half the class matching to one of the “generalist” disciplines, such as internal medicine or primary care. Nationwide, reported the National Resident Matching Program, 51 percent of this year’s matches entered internal medicine, family practice or pediatrics. Of the 108 Yale medical students in the Match this year, 29 chose internal medicine, five chose primary care and 20 chose pediatrics. Six students matched with orthopaedics programs and nine matched in dermatology, an increase over previous years in both specialties. Ten students entered obstetrics and gynecology residencies and six went into general surgery.

Cynthia Andrien, assistant dean for student affairs, said 90 percent of the class matched to one of their top three choices and 94 percent matched to one of their top five.

GALE ZUKER



2000 residency placements for Yale medical students

The Office of Student Affairs has provided the following list, which outlines the results of the National Resident Matching Program for Yale’s medical school graduates. Some names appear twice because the graduate is entering a one-year program before beginning a specialty residency. The transitional designation is a one-year program with three-month rotations in different specialties.

CALIFORNIA

Harbor – UCLA Medical Center, Torrance

Anne Uyei, internal medicine

Santa Clara Valley Medical Center, San Jose

Amy Jan, transitional

Stanford University Programs

Donna Akutagawa, pediatrics
Matthew Falk, pediatrics
Albert Kao, internal medicine
Megan Lisska, pediatrics
Neda Pakdaman, internal medicine
Russell Woo, general surgery

UCLA Medical Center – Los Angeles

Darcy Bryan, obstetrics and gynecology
Julian Martinez, pediatrics

University of California – San Diego

Victoria Morrison, ophthalmology

University of California – San Francisco

Lauren Goldman, internal medicine
Amy Levin, internal medicine

Royce Lin, internal medicine

Theodore Ruel, pediatrics/primary

Darcy Thompson, pediatrics/primary

CANADA

McMaster University, Hamilton, Ontario

Julie-Ann Francis, obstetrics and gynecology

University of Toronto

Evelyn Maxwell, obstetrics and gynecology

COLORADO

University of Colorado School of Medicine, Denver

John Coombes, internal medicine
Sereena Tamburri, obstetrics and gynecology

CONNECTICUT

St. Vincent’s Medical Center, Bridgeport

Brian Egan, transitional

Yale-New Haven Hospital

Alicia Arbaje, internal medicine
Matthew Cooperberg, surgery, urology
Amin Fazeli, medicine
Dawn Grosser, orthopaedics
Ophir Klein, pediatrics
Rachel Lovins, internal medicine/primary
Michele Mak, medicine
Yoon Mo Myung, medicine/primary
Amy Nuernberg, internal medicine
Gilbert Ortega, orthopaedics
Maya Salameh, internal medicine
Julie Schaffer, dermatology, pediatrics – preliminary
Meredith Talbot, internal medicine
Melissa Wolfe, pediatrics

DISTRICT OF COLUMBIA

George Washington University

John Mahoney, orthopaedics, surgery

ILLINOIS

Children’s Memorial Hospital, Chicago

Michal Radzynski, pediatrics

McGaw Medical Center, Northwestern University, Chicago

William Posten, dermatology, medicine
Ronald Yap, surgery

Northwestern University Medical Center, Chicago

Ronald Yap, urology

Rush-Presbyterian – St. Luke’s, Chicago

Dirk Johnson, surgery

University of Illinois College of Medicine, Chicago

Rebecca Dubowy, obstetrics and gynecology

IOWA

University of Iowa Hospitals and Clinics, Iowa City

Robert Kadoko, orthopaedics

MARYLAND

Johns Hopkins Hospital, Baltimore

Wendi Brown, obstetrics and gynecology
Simon Yoo, dermatology

Johns Hopkins University/Sinai Hospital, Baltimore

Brian Galbut, medicine

Johns Hopkins University, Baltimore

Constance Nduaguba, ophthalmology
Maryland General Hospital, Baltimore
Constance Nduaguba, transitional

University of Maryland Medical Center, Baltimore

Marlon Maragh, surgery

MASSACHUSETTS

Beth Israel Deaconess Medical Center, Boston

Phillip Chan, internal medicine
Jersey Chen, medicine
David Friedman, internal medicine
Liza Halpern, internal medicine
Naomi Katz, obstetrics and gynecology
Ashish Patel, general surgery

Boston Combined Residency Program in Pediatrics (Childrens Hospital)

Laurie Hickey, pediatrics

Brigham & Women’s Hospital, Boston

Karin Andersson, internal medicine
Kathryn Cunningham, internal medicine/primary
Brian Egan, anesthesiology
Azita Hamedani, emergency medicine
Simon Yoo, medicine

Harvard Combined Medicine/Pediatrics Program (Massachusetts General Hospital)

Candice Camacho, medicine/pediatrics

Harvard Longwood Psychiatry, Boston

Jessica Morgan, psychiatry

Harvard Medical School, Boston

John Abraham, orthopaedics



Far left: Their children in their arms, Jody and Elie Levine opened their envelopes together.

Left: Kate Langworthy, Megan Lisska and Matthew Falk compare notes on their matches.

Massachusetts General Hospital, Boston

Amin Fazeli, dermatology
Ara Feinstein, general surgery
Carl Seashore, pediatrics
Deborah Wexler, internal medicine/primary

New England Medical Center, Boston

Elizabeth Egan, internal medicine
Lisa Natkin, pediatrics

Tufts University Family Practice Residency, Malden

Johnathan Henderson, family practice

NEBRASKA

Lincoln Medical Education Foundation, Lincoln

Bridgett Broz, family practice

NEW YORK

Albany Medical Center Hospital, Albany

Michele Mak, dermatology

The Mount Sinai Hospital

Kerin Adelson, internal medicine
Daniel Caplivski, internal medicine
Daniel Jacoby, internal medicine
Elie Levine, plastic surgery
Jody Levine, pediatrics/primary
Jonathan Ripp, internal medicine
Joanna Sheinfeld, internal medicine
Stacey Weiss, internal medicine

New York Presbyterian Hospital – Columbia

Amy Dudenhoefer, internal medicine
Lisa Eiland, pediatrics
Melissa Ellis, pediatrics
Elizabeth Harrold, internal medicine

New York Presbyterian Hospital – Cornell

Evelyn Duvivier, internal medicine/primary

New York University Medical Center

Leslie Boyd, obstetrics and gynecology
Kenneth Harris, internal medicine/primary
Hanna Kim, dermatology

St. Vincent's Hospital

Alison Gruen, medicine

SUNY Health Science Center at Brooklyn

Alison Gruen, dermatology

NORTH CAROLINA

Duke University Medical Center, Durham

Christopher Chang, otolaryngology, surgery
Leigh Elmore, obstetrics and gynecology

OHIO

Cleveland Clinic Foundation, Cleveland

Saba Kaiseruddin, pediatrics

The University Hospital, Cincinnati

Jason Sluzevich, dermatology
Arvind Venkat, emergency medicine
Jennifer Yee, medicine

OREGON

Oregon Health Sciences University, Portland

Gregory Austin, internal medicine
Julie Davis, pediatrics

PENNSYLVANIA

Children's Hospital of Philadelphia

Aaron Milstone, pediatrics
Amy Winkelstein, pediatrics

Hospital of the University of Pennsylvania, Philadelphia

Jersey Chen, diagnostic radiology
Thomas Courtney, orthopaedics
Lee Goldstein, general surgery
Max Kelz, anesthesiology
Andrew Resnick, general surgery
Grace Shih, internal medicine
Jakub Svoboda, internal medicine

University Health Center of Pittsburgh

Jose Prince, general surgery
Tanya Smith, obstetrics and gynecology

University of Pennsylvania Health Systems/Presbyterian Hospital, Philadelphia

Max Kelz, transitional

PUERTO RICO

University of Puerto Rico

Cristina Ferrari, ophthalmology, transitional

RHODE ISLAND

Brown University/Rhode Island Hospital, Providence

Yoon Mo Myung, ophthalmology

Memorial Hospital of Rhode Island, Pawtucket

Angela Rubineau, family practice

SOUTH CAROLINA

Medical University of South Carolina, Charleston

Masha Huseinovic, internal medicine

TEXAS

Baylor College of Medicine – Houston

Katherine Langworthy, pediatrics

UTAH

University of Utah Affiliated Hospitals, Salt Lake City

Victoria Morrison, medicine

WASHINGTON

University of Washington Affiliated Hospitals, Seattle

Jennifer Dorosz, internal medicine
Amy Jan, dermatology

WISCONSIN

University of Wisconsin Hospital and Clinics, Madison

Jennifer Griffiths, family practice

Songs and dance to benefit minority high school students

Medical students strutted their stuff in January at the Seventh Annual Grannum Jamboree, showing once again that they are as familiar with a guitar or dance steps as they are with the 206 bones in the human body. The jamboree's selections ranged from songs by the Yale Gospel Choir to a humorous song about life in New Haven performed by Mike Fehm and accompanists. LaLisa Alita Anderson read from her collection of oral histories, *On the Other Side: African Americans Tell of Healing*, to be published next spring by Westminster John Knox Press. Rashida N'Gouamba choreographed a dance set to kweitso music from South African black townships.

The show's proceeds benefit HPREP, the Health Professions Recruitment and Enrichment Program, a 10-week program that brings area high school students to the medical school on Saturday mornings for classes on health-related topics. This year 43 high school students participated and at the end of the program the top students received college scholarships.

The jamboree is held in honor of the late Dr. Peter Grannum, former director of medical studies in the Department of Obstetrics and Gynecology, and two-time winner of the Francis Gilman Blake Award for outstanding teaching in the medical sciences.

Performers at the Grannum Jamboree included the Yale Gospel Choir (top); LaLisa Anderson reading from her collection of oral histories; and the Ultrasounds, an a capella group that featured Ada-Nkem Nwaneri, singing the solo.



JOHN CURTIS (3)



Top: Tracey Cho and Scott Berkowitz, the show's producers, led the cast in the finale, "We're on the Wards," sung to the tune of "We Are the World."

Above: Matt Stiebel, Greg DeBlasi, James Schafer and Anil Shivaram played the "Cedar Street Boys," singing about life on the wards to the tune of "Larger than Life," the hit by the Backstreet Boys. "All you teachers, can't you see, can't you see, how a lack of sleep affects how we be?" they sang.

Right: Marlyanne Pol and Claire Stylianopoulos sing and dance in the opening scene.



ERIC KANE (3)

I Know What You Did Last Semester

Early in the first act of *I Know What You Did Last Semester*, the Class of 2002's second-year show, a heckler in the balcony shouted, "Where's the plot?" It soon became apparent that this year's show had none. Presented in February, the show offered a series of songs, dances, skits and videos stitched around the theme of accreditation. LCME accreditors, played by Max Laurans and Premila Bhat, wandered through scenes of the school, comparing the official view to their own observations. "This medical school is out of control!" said the accreditor played by Bhat. "There is an utter lack of discipline!"

The dazzling opening number, choreographed by Jacqueline Park, offered a wild view of life on Cedar Street, with male med students as leering Lotharios and the females as gum-chewing schoolgirls dressed in Mary Janes. The show featured appearances by Dean David A. Kessler as himself, plus cameos by Nancy R. Angoff, M.D. '90, HS '93, M.P.H. '81, associate dean for student affairs, and Ruth Katz, J.D., M.P.H., associate dean for administration, also mocking themselves. Kessler mimicked himself giving a speech and, departing from the script, announced to cheers as well as boos, "This show is the best I have ever seen since coming to Yale."

The show, produced by Scott Berkowitz and Tracey Cho, also targeted a doctor-patient encounter course conducted by Thomas Duffy,

M.D., depicting it as TV's obnoxious *Jerry Springer Show*. Another skit made fun of the TV quiz show *Who Wants To Be a Millionaire?*, with contestants answering medical exam questions and others on the order of "Which third-year student soiled his pants during the boards?" One contestant made the mistake of turning to "lifeline" Pietro De Camilli, M.D., chair of cell biology, for help in choosing between GTP and GDP. For at least three years in a row the show has poked fun at his inflection, which allegedly renders the two abbreviations indistinguishable to students.

During the second act, first-year students took the stage briefly to sing an unintelligible ode to Robert H. Gifford, M.D., HS '67, the recently retired deputy dean for education, to the tune of a Tom Petty ballad. For a second prank, first-year students hiding in light fixtures above the ceiling dropped ping-pong balls on the stage. Second-years refused to let that pass. A quickly typed message of congratulations soon flashed on the screen behind the stage, followed by a note of surprise. "We didn't know you had any balls."

The show ended with the entire Class of 2002 singing "We're on the Wards," to the tune of "We Are the World." "We're on the wards," they sang, "but we're not doctors. We're the ones in your hospital rooms asking dumb questions."



ALUMNI NEWS

Fitness center dedicated

For years the only exercise facility available on the medical school campus was an airless weight room in the basement of Harkness dormitory. Now, thanks to the efforts of the Class of 1958, students can work out in a new fitness center equipped with weights, treadmills and a variety of exercise machines. Spearheading the initiative was Gerard Burrow, former dean and currently special advisor to the president of the University for health. Among Burrow's motivations was a sense of guilt, he confessed. "When I was an assistant professor I lobbied the dean very hard to protect the two squash courts that were there," he said. "Then when I was dean I found it necessary to take out the last squash court."

David Carlson, Burrow, Andrew McGowan, John Creatura, Robert Donohue and (pumping iron) Michael Kashgarian, celebrated the opening of the Class of 1958 Student Fitness Center on Feb. 9.

JOHN CURTIS



ALUMNI NOTES

50s



Leo H. Berman, M.D., HS '53,

writes to say that 51 years after graduation from medical school, he is still active in the practice of psychiatry. "Why retire when one can still grow in one's profession?" he asks.

Arnold D. Welch, M.D., M.A.H. '53, at age 91, sent us a greeting from his new home in San Diego, where he moved three years ago. Welch was the third chair of the Department of Pharmacology at the School of Medicine, a post he held for 14 years. He introduced a molecular approach to pharmacology and, with his eye for spotting and recruiting talented researchers, led the department to national prominence. He left Yale in 1967 to become vice president for research and development at Bristol-Myers Squibb. After a mandatory

retirement in 1976, he became chair of a new department of pharmacology at St. Jude Children's Research Hospital. In 1984 he joined the staff of the National Cancer Institute in Bethesda. He retired in 1989.

Harry C. Miller Jr., M.D. '54, emeritus professor and chair of the Department of Urology at George Washington University, received the 2000 Gold Cane Award in May from the American Urological Association (AUA) at its annual meeting in Atlanta. Miller, now retired and enjoying his leisure time with his family, was honored for his distinguished service as an outstanding clinician, academician and teacher in urology, and section representative to the AUA.

60s



Herbert W. Boyer, Ph.D., postdoctoral fellow '63-66, and the late

Robert A. Swanson, cofounders of Genentech, Inc., were honored as the recipients of the second annual Biotechnology Heritage Award. Presented in March by the Chemical Heritage Foundation and the Biotechnology Industry Organization, the award recognizes the extraordinary achievements of individuals whose careers helped shape the biotechnology revolution. Boyer's work with Stanley Cohen, M.D., led to the invention of recombinant DNA technology, an advance that signaled the beginning of genetic engineering and transformed the basic science of molecular biology.



Charles D. Cook, M.D. '64, of Old Lyme, Conn., writes to say that he is "Finally completely retired and enjoying it!" Cook has been in academic pediatrics his entire professional life, first at Harvard, then as chair of pediatrics at Yale University School of Medicine and at the State University of New York Health Science Center at Brooklyn. He was also chief of pediatrics at Rochester General Hospital in New York. In 1992 he returned to Connecticut and the Hill Health Center, which he had been instrumental in founding more than 30 years ago. Since 1993 Cook has taught in the Pediatric Primary Care Unit at Yale-New Haven Hospital and was a lecturer at Yale School of Medicine. Last year he attended his grandson's graduation from University of Vermont College of Medicine. Jason Cook, shown with his father, Andrew, and grandfather, Charles, is a 12th generation physician.

Diane K. Shrier, M.D. '64, clinical professor of psychiatry and pediatrics at George Washington University Medical Center, and Lydia A. Shrier, M.D., M.P.H. '87, HS '94, on the faculty of Harvard Medical School and in Adolescent/Young Adult Medicine at Boston Children's Hospital, are seeking data from mothers and daughters in medicine for their research

project, "Generation to Generation, Mother-Daughter Physicians." Information can be sent to Diane K. Shrier, M.D., 1616 18th St., NW, Suite 104, Washington, DC 20009; e-mailed to diane.shrier.med.64@aya.yale.edu, or faxed to 202-965-2942. Lydia Shrier recently was awarded a five-year career development award from the National Institute of Mental Health for her research on mental health and sexual risk behavior in adolescents.

Charles F. Stevens, M.D. '60, investigator at the Howard Hughes Medical Institute and professor at The Salk Institute for Biological Studies in La Jolla, Calif., received the National Academy of Sciences Award for Scientific Reviewing. Stevens was chosen for his numerous "News and Views" articles in *Nature* that, for more than a decade, reviewed nearly all of the major advances in molecular neuroscience. The award, which has been presented since 1979, was established by

Annual Reviews Inc. and the Institute for Scientific Information in honor of J. Murray Luck.

70s



R. Michael Buckley, M.D., '72, has been named chair of the

Department of Medicine at Pennsylvania Hospital and vice chair of the Department of Medicine at the University of Pennsylvania Health System. Buckley is also a clinical professor of medicine at the University of Pennsylvania and maintains an active clinical practice specializing in internal medicine and infectious diseases.

H. Steven Moffic, M.D. '71, vice chair for managed care and professor of psychiatry, behavioral medicine, and family and community medicine with the Froedtert Behavioral Health Center at the Medical College of Wisconsin, has served as president of the American

Association for Social Psychiatry (AASP), for the past two years. He has proposed a new health reform plan named Universal Accountable Healthcare and established the Moffic Award for Ethical Practice in Public Sector Managed Behavioral Healthcare with the AASP.

80s

Alan M. Gruenberg, M.D., HS '85, professor of psychiatry and human behavior at Jefferson Medical College and president of Gruenberg and Summers, P.C., a clinical and consulting psychiatric practice in Bryn Mawr, Penn., has been named top doctor among psychiatrists and top doctor for women by *Philadelphia* magazine.

John T. Whalen, M.D. '89, of Albany N.Y., was inducted in March as a fellow of the American Academy of Orthopaedic Surgeons during ceremonies at the Academy's 67th annual meeting in Orlando.

90s



Susan G. Anderson, M.D. '90, clinical assistant professor

at Stanford University School of Medicine, and co-director of the new Stanford Travel Medicine Service, is senior editor for the Women's Travel Center section of the medical Web site, www.medicineplanet.com. The site, which opened in March, offers health information for overseas travelers, including country-specific data on infectious disease.

Mary Gilbert Lawrence, M.D., M.P.H. '98, has been appointed associate professor of ophthalmology at the University of Minnesota School of Medicine. She also is an attending surgeon for the Glaucoma Service, director of the Visual Rehabilitation Service and associate chief at the Minneapolis Veterans Affairs Medical Center.

JIM ANDERSON (2)



Honoring alumni, students and benefactors

Two events on May 6 honored alumni, benefactors and recipients of endowed scholarships. A ceremony dedicated a garden bench in honor of the late John B. Ogilvie, M.D. '34, "distinguished surgeon, dedicated and generous alumnus, friend to Yale Medical students." Above left: Donna Brace Ogilvie and Knowles B. Lawrence, M.D. '34, one of her husband's classmates, attended the dedication. Later that day the inaugural Celebration of Scholarship luncheon recognized donors who make possible endowed scholarships and the students who have benefited from them. Last year 67 students received financial aid from 41 endowed scholarships. M. Felix Freshwater, M.D. '72, whose class established a fund in 1997, gave a talk entitled, "Establishing an endowed scholarship—charity or moral imperative?" Below left: Among those attending the luncheon were Robert Kadoko, M.D. '00, recipient of the Freshwater-Class of 1972 Scholarship, and former deputy dean Arthur Ebbert Jr., M.D.

In memoriam

Daniel Bergsma, M.D. '36, of Raleigh, N.C., died Nov. 23 at Rex Hospital in Raleigh at the age of 90.

After Bergsma received his medical degree from Yale he studied public health at the University of Michigan, where he received his degree in 1946. He was the New Jersey State Director of Health for many years and later worked for the National Foundation (NF), now known as the March of Dimes. At the NF, he first oversaw medical care for polio patients and later edited a compendium on birth defects.

Joseph A. Criscuolo, M.D. '38, of Wabasha, Minn., died Jan. 2. He was 87.

Criscuolo received a bachelor's degree from Yale University in 1934 and his medical degree from the School of Medicine, where he was inducted into the Alpha Omega Alpha Honor Society. During World War II he joined the Army and served as commander of the troop hospital ship Ernest Korinda. He left the military in 1945 with the rank of major. Criscuolo was assistant professor of surgery at Cornell Medical College and served on the staff of both Doctor's and Roosevelt hospitals in New York City from 1946. He moved to Palm Springs, Calif., in 1965, where he both served as director of emergency services at Desert Hospital and had a private practice as a trauma surgeon.

Guido A. DeBlasio, M.D. '37, of Pelham, N.Y., died on April 18. He was 89.

DeBlasio graduated from Cornell University in 1933. After receiving his medical degree from Yale School of Medicine, he stayed in New Haven for his internship and residency training in pediatrics, surgery and ob/gyn until 1944. He also was an assis-

tant in surgical bacteriology at Yale from 1941 until 1943.

DeBlasio served as a major in the Army Medical Corps during World War II and was a practicing surgeon at Mt. Vernon Hospital for 40 years.

Eloise 'Tommy' Haywood Heath, Ph.D. '30, died Jan. 2 at the Veteran's Home in South Paris, Maine. She was 95.

Heath graduated from Vassar College in 1926 and received her Ph.D. in public health (bacteriology) from Yale. From 1927 until 1930 she was a research assistant in public health at Yale. In 1933, Heath became chief chemist at the New Haven, Conn., Water Company; at the time she was said to be the only woman serving in such a position in the United States. She later joined the staff of the Connecticut Tuberculosis Association.

She and her husband retired to Chapel Hill, N.C., in 1972.

David W. Marby, M.D. '93, a pediatric physician from Boston, died Jan. 8 in New York. He was 41.

Born in France, Marby received a bachelor's degree in psychology from Boston College and was a mental health worker at McLean Hospital in Belmont, Mass. He later graduated from Yale School of Medicine and served his internship and residency in pediatrics at Massachusetts General Hospital. Marby then entered a fellowship program in pediatric emergency medicine at New York-Presbyterian Hospital. He also served as assistant clinical professor of pediatrics and as a pediatric emergency-attending physician for Babies and Children's Hospital of New York at New York-Presbyterian Hospital.

Joe D. Morris, M.D. '46, of Ann Arbor, Mich., died Jan. 8 of cancer at the Arbor Hospice Residence. He was 78.

Morris served as a captain in the Army Air Corps in San Antonio from 1947 to 1949. He resumed his surgical training at Baylor University in Houston and thoracic surgery training at University Hospital in Ann Arbor.

Morris, a pioneer in heart surgery, was a professor of surgery at University Hospital until 1973. He served as head of thoracic surgery at St. Joseph Mercy Hospital until he retired in 1985. During his career he helped develop and improve the Sarns' heart lung machine and with his friend and neighbor, Richard Sarns, developed other surgical instruments, such as the sternum saw.

Irving M. Polayes, D.D.S., M.D., one of the early founders of plastic surgery in New Haven, died on Dec. 10. He was 72.

Polayes, who began his career as a dentist, graduated from Duke University in 1948. He received his doctor of dental science degree from Columbia University School of Dental and Oral Surgery in 1953 and after his internship and residency at Presbyterian Hospital of New York, he served as a lieutenant commander in the U.S. Navy Dental Corps.

Polayes received his medical degree at the Albany Medical College of Union University in 1959. After completing his internship, residency and fellowships in 1965 he opened a practice in New Haven with Marvin Arons, D.M.D., M.D. '57. During more than 30 years on the Yale faculty he served as associate section chief of plastic surgery at Yale-New Haven Hospital and clinical professor of plastic surgery. He also was an accomplished violinist and author.

John J. Sullivan, M.D. '51, died Feb. 10 in Bridgeport Hospital. He was 80.

A Connecticut native, Sullivan attended Providence College before enlisting in the U.S. Navy, where he served as a pharmacist's mate first class on the U.S.S. Thomas Stone in the Mediterranean in Operation Torch. He graduated from Tufts University magna cum laude in 1947 and then received his medical degree from Yale School of Medicine. Sullivan spent 48 years in private practice as a family physician and was past president of the medical staff at Bridgeport Hospital.

Francis M. Woods, M.D. '33, of Needham and Jaffrey, N.H., died of pneumonia on Jan. 24 at Brigham and Women's Hospital in Boston. He was 91.

Woods, son of Dr. Andrew H. Woods, a medical missionary, spent much of his childhood in China. He was a 1930 Yale College graduate and received his medical degree from the School of Medicine. In 1946, after serving residencies in Rochester, N.Y., and Cincinnati, he joined the Overholt Thoracic Clinic in Boston until 1973. After his retirement from the clinic, he continued to practice medicine in Peterborough, N.H.

Early in his career as a thoracic surgeon, he became aware of the correlation between smoking and lung cancer. After retiring, he continued to visit primary and secondary schools in New England to deter young people from smoking.

Throughout his career, Woods reached out to medical students and needy patients in Nicaragua, Sri Lanka, Brazil and Jamaica through Project Hope. He also worked with patients and students in Haiti. He was on the clinical faculty at Tufts and Harvard medical schools.

Continuing Medical Education at Yale

For information, contact the Office of Postgraduate and Continuing Medical Education, Yale University School of Medicine, 333 Cedar Street, New Haven, CT 06520.
Tel: (203) 785-4578

September 8 (Friday)

Fourth Annual Yale Glaucoma Symposium

Course Director: M. Bruce Shields, M.D.
Water's Edge, Old Saybrook, CT

September 9 (Saturday)

Sleep Medicine: An Update for Primary Care Providers, Pediatricians and Family Physicians

Course Directors: Carolyn M. D'Ambrosio, M.D.
and Lewis Kass, M.D.
Foxwood's, Ledyard, CT

September 9 (Saturday)

The NeuroTherapeutic Effects of Music

Course Director: Nash Boutros, M.D.
Jane Ellen Hope Building Room 110

September 14-16 (Thursday-Saturday)

Technically Challenging Procedures in Adult Cardiac Surgery

Course Director: John A. Elefteriades, M.D.
Foxwood's, Ledyard, CT

September 20-24 (Wednesday-Sunday)

The 24th Yale PA Board Review / Primary Care Conference

October 13 (Friday)

The Moshe Lahav Lecture in Ophthalmic Pathology

Course Director: M. Bruce Shields, M.D.
Harkness Auditorium

October 19 (Thursday)

Third Annual Frisbee Stem Cell Symposium

Course Director: Edward Snyder, M.D.
Omni Hotel, New Haven, CT

October 19 (Thursday)

Frontiers in Cancer Cytotherapy

Course Director: Edward L. Snyder, M.D.
Omni Hotel, New Haven, CT