

The image shows the front cover of a book. The cover has a black, heavily textured background that resembles crumpled paper or a similar material. The title is printed in a bold, sans-serif font, with the words stacked vertically. The letters are primarily yellow, but some letters, such as the 'A' in 'AND ITS' and the 'A' in 'AFTERMATH', are white. The text is centered and occupies most of the cover area.

THE INCIDE
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AFTERMATH

Dianna Frid *Words from Obituaries*

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Words from Obituaries

Thurs, June 26, 2003

Fred Sandback, 59, Sculptor Of Minimalist Installations

By KEN JOHNSON

Fred Sandback, a sculptor internationally known for his Minimalist works made from lengths of colored yarn, died on Monday at his studio in New York. He was 59.

Mr. Sandback, who suffered from depression, committed suicide, said his wife, Amy Baker Sandback.

For almost 40 years, Mr. Sandback persisted in using the simplest of means to create subtly complex perceptual effects. His most characteristic works were composed of store-bought acrylic yarns in various colors, which he would stretch between different points on the walls, ceilings and floors of exhibition spaces. In response to the architecture of a particular interior, he might produce floor-to-ceiling verticals or he might outline closed forms like parallelograms, rhombuses or triangles.

To the viewer's eye, the thin, slightly fuzzy yarn would seem to lose its physical presence and turn into dematerialized lines of color. His compositions also had another uncanny illusionistic effect: the colored lines seemed like the edges of transparent, glasslike planes.

This paradoxical play with material fact and perceptual illusion had philosophical implications. Like other Minimalists, Mr. Sandback wanted to focus the viewer's awareness on the here and now, to avoid directing the imagination toward anything not immediately present. Without any solid object or symbolic reference, his works promoted a heightened sensitivity to the experience of being and moving about in space and to ways that perceptions can alter the bare facts.

The artist traveled internationally to install his works at galleries and museums, carrying all the materials he needed in a single bag.

Frederick Lane Sandback was born in Bronxville, N.Y., on Aug. 29, 1943. After majoring in philosophy at Yale, he went on to the Yale School of Art and Architecture, earning an M.F.A. degree in sculpture in 1969. Decisively influenced as a student by the visiting instructors Donald Judd and Robert Morris, founders of the Minimalist movement, Mr. Sandback started creating simple, linear structures by bending and welding lengths of thin steel rod.

In 1967, Mr. Sandback produced the sculpture that would establish the terms of his mature work. Using string and wire, he outlined the shape of a 20-foot-long 2-by-4 board lying on the floor. Though in fact they contained nothing but air, the lines read as the edges of an almost visible object. From that piece it was a short but significant step to the manipulation of space itself.

Success came early for Mr. Sand-



Nic Tenwaggenborn

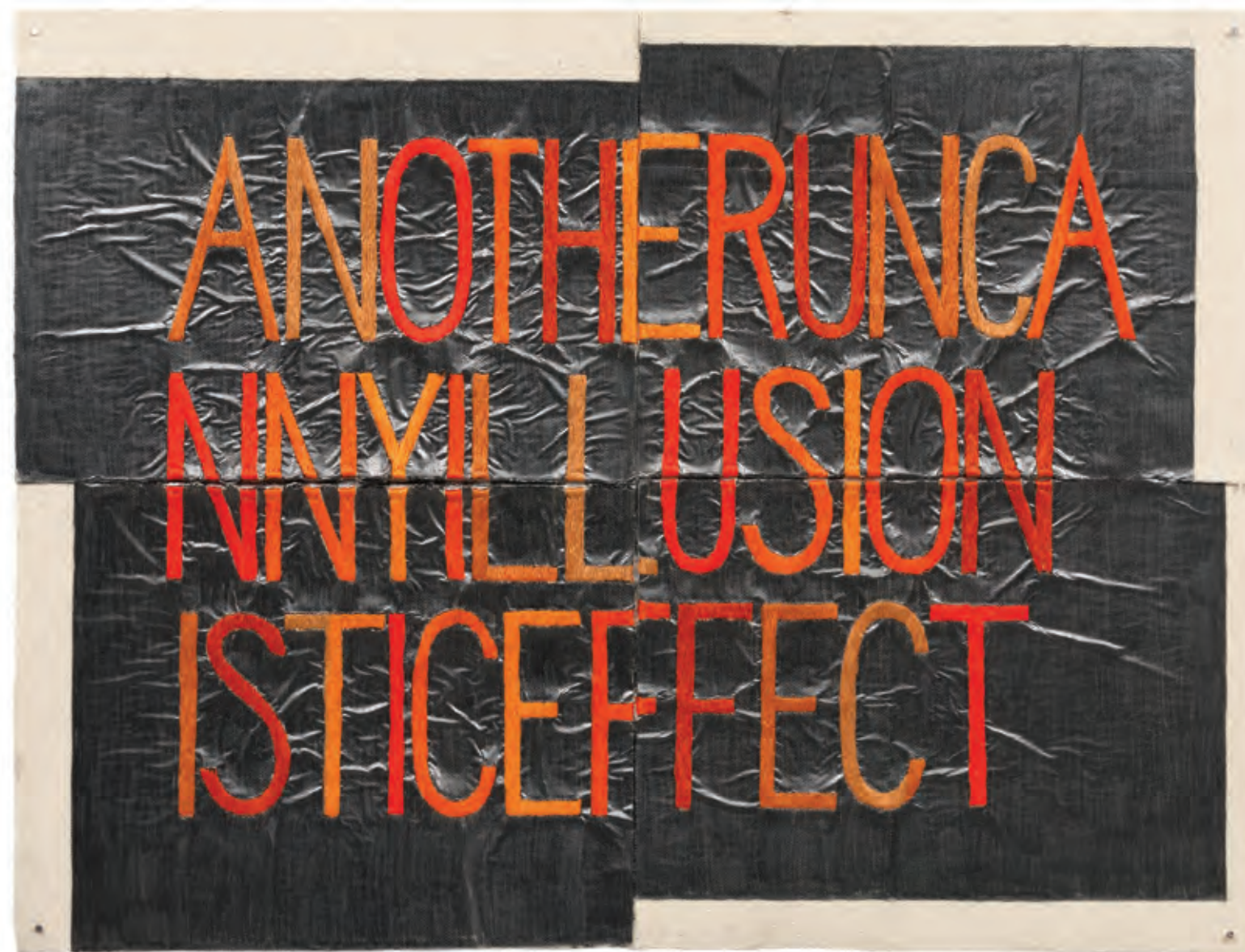
Fred Sandback installing his work at Dia:Beacon in February.

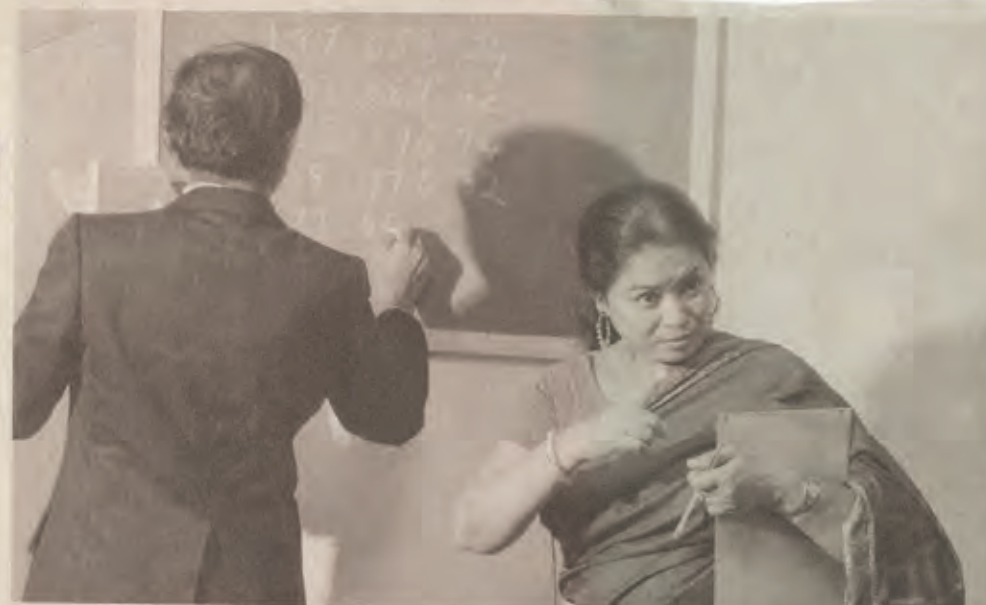
Creating complex effects with simple store-bought yarn.

back. In 1968, while still a student at Yale, he had his first two solo exhibitions, both in Germany. One was at the Munich gallery of Heiner Friedrich, who helped create the Dia Art Foundation in New York in 1974. Mr. Sandback was one of a small group of avant garde artists sponsored by the Dia Center for the Arts. Like several of them, Mr. Sandback opened a Dia-financed institution dedicated to his own work, the Fred Sandback Museum. Housed in a former bank building in Winchendon, Mass., not far from his studio in Rindge, N.H., the museum operated from 1981 until 1996, when the artist decided to close it. Works by Mr. Sandback are included in a current major exhibition at Dia:Beacon, the recently opened museum of contemporary art in Beacon, N.Y.

In addition to his wife, Mr. Sandback is survived by two children from a previous marriage, Peter Sandback of Hancock, N.H., and Annika Sandback of Hoboken, and two grandchildren.

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BARTON SILVERMAN/THE NEW YORK TIMES

Shakuntala Devi in 1976 in New York demonstrating her ability to do complex math problems.

Shakuntala Devi, 83, 'Human Computer'

By HARESH PANDYA

Shakuntala Devi, an Indian mathematical wizard known as "the human computer" for her ability to make incredibly swift calculations, died on Sunday in Bangalore, India. She was 83.

The cause was respiratory and cardiac problems, said D. C. Shivadev, a trustee of the Shakuntala Devi Educational Foundation Public Trust.

Ms. Devi demonstrated her mathematical gifts around the world, at colleges, in theaters and on radio and television. In 1977, at Southern Methodist University in Dallas, she extracted the 23rd root of a 201-digit number in 50 seconds, beating a Univac computer, which took 62 seconds.

In 1980, she correctly multiplied two 13-digit numbers in only 28 seconds at the Imperial College in London. The feat, which earned her a place in the 1982 edition of the Guinness Book of World Records, was even more remarkable because it included the time to recite the 26-digit solution.

(The numbers, selected at random by a computer, were 7,686,369,774,870 and 2,465,099,745,779. The answer was 18,947,668,177,995,426,462,773,730.)

Shakuntala Devi was born in Bangalore on Nov. 4, 1929. Her father was a trapeze artist and lion

tamer in a circus. Survivors include a daughter and two grandchildren.

She was about 3 and playing cards with her father when he discovered that she was a mathematical prodigy with an uncanny ability to memorize numbers. By the time she was 5, she had become an expert at solving math problems.

Ms. Devi won fame demonstrating her math skills at the circus, and later in road shows arranged by her father.

"I had become the sole breadwinner of my family, and the responsibility was a huge one for a young child," she once said. "At the age of 6, I gave my first major show at the University of Mysore, and this was the beginning of my marathon of public performances."

She toured Europe in 1950. When she appeared on the BBC, her answer to a difficult calculation was different from the interviewer's. It turned out that she was right. Similarly, at the University of Rome, one of her answers to a problem was found to be wrong, until the experts re-examined their own calculations.

When Ms. Devi performed in New York in 1976, an article in The New York Times marveled at her abilities: "She could give you the cube root of 188,132,517 — or

almost any other number — in the time it took to ask the question. If you gave her any date in the last century, she would tell you what day of the week it fell on."

In a 1990 journal article about Ms. Devi, Arthur R. Jensen, a researcher on human intelligence at the University of California, Berkeley, noted that unlike the Dustin Hoffman character in the movie "Rain Man," an autistic savant who was also a mathematical prodigy, "Devi comes across as alert, extroverted, affable and articulate."

He posited that for Ms. Devi, "the manipulation of numbers is apparently like a native language, whereas for most of us arithmetic calculation is at best like the foreign language we learned in school." But he added that she built on her inherent skills through intense practice as a child.

Ms. Devi was also a successful astrologer, cookbook author and novelist.

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NYT Friday April 26 2013 p. B.15

Category: Performer - Athletic



Jacob Bekenstein, Physicist, Dies at 68; Revolutionized the Study of Black Holes

By DENNIS OVERBYE

Jacob Bekenstein, a physicist who prevailed in an argument with Stephen Hawking that revolutionized the study of black holes, and indeed the nature of space-time itself, died on Sunday in Helsinki, Finland, where he was to give a physics lecture. He was 68.

The cause was a heart attack, said the Hebrew University of Jerusalem, where Dr. Bekenstein was the Michael Polak professor emeritus of theoretical physics.

Dr. Bekenstein's greatest achievement came in the early 1970s, when he was a graduate student at Princeton and got into a feud with Dr. Hawking, the celebrated physicist and expert on black holes.

Black holes are the prima donnas of Einstein's general theory of relativity, which predicts that space wraps itself completely around some object, causing it to disappear as a black hole. Dr. Bekenstein suggested in his Ph.D. thesis that the black hole's entropy, a measure of the disorder or wasted energy in a system, was proportional to the area of a black hole's event horizon, the spherical surface in space from which there is no return. According to accepted physical laws, including Dr. Hawking's own work, neither entropy nor the area of a black hole could ever decrease.

Raphael Bousso, of the University of California, Berkeley, who was both a student of Dr. Hawking's and a friend of Dr. Bekenstein's, called Dr. Bekenstein's proposition "among the most daring, yet elegant, arguments that I've seen in physics."

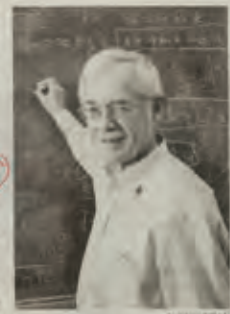
Dr. Hawking denounced the idea. According to classical physics, anything with entropy had to have a temperature, and anything with a temperature — from a fevered brow to a star — must radiate heat and light with a characteristic spectrum. But a black hole could not radiate, and thus it could have no temperature and therefore no entropy.

Or so everybody thought until 1974, when Dr. Hawking did a prodigious calculation including quantum theory, the strange rules that govern the subatomic world, and was shocked to find

particles coming away from the black hole, indicating that it was not so black after all.

Afraid he had made a mistake, Dr. Hawking, as he wrote in his book "A Brief History of Time," kept his calculation quiet at first. "I was afraid," he said, "that if Bekenstein found out about it, he would use it as a further argument to support his ideas about the entropy of black holes, which I still did not like."

He was finally convinced, Dr.



A Bekenstein theory won over a skeptical Stephen Hawking.

Hawking wrote, when he recognized that the radiation from the black hole would have the same characteristic heat spectrum as heat, just as Dr. Bekenstein's theory had implied.

Today it is called Bekenstein-Hawking radiation, and its discovery is considered a landmark in the quest, so far unfinished, to fulfill the Einsteinian dream of a unified theory of both the gravity that bends the cosmos and the quantum chaos that lives inside of it, so-called quantum gravity.

Dr. Bekenstein received the Wolf Prize in 2012 and the American Physical Society's Einstein prize this year. Both have often been precursors to the Nobel Prize. (The Nobel is not awarded posthumously.)

Lee Smolin, a theorist at the Perimeter Institute for Theoretical Physics in Waterloo, Ontario, said, "No result in theoretical

physics has been more fundamental or influential than his discovery that black holes have entropy proportional to their surface area."

Dr. Bousso called Dr. Bekenstein "one of the very few giants in the field of quantum gravity."

Jacob David Bekenstein was born in Mexico City on May 1, 1947, to Joseph Bekenstein, a carpenter, and the former Esther Vladislavovskaya, a homemaker. Jewish immigrants from Poland, they had met in Mexico during World War II.

Inspired by the launch of the Russian satellite Sputnik in 1957, Jacob and his friends gathered after school to launch rockets.

He became an American citizen in 1968 while attending the Polytechnic University of Brooklyn, now part of New York University, from which he graduated in 1969. He maintained American and Israeli citizenship.

He went on to graduate school at Princeton, gaining a Ph.D. in 1972 under John Wheeler, the teacher and visionary who popularized the term black hole.

After a postdoctoral stint at the University of Texas at Austin, Dr. Bekenstein moved to the Ben-Gurion University of the Negev in Beersheba, where he eventually became chairman of the astrophysics department. In 1990 he joined the faculty of the Hebrew University of Jerusalem.

He is survived by his wife, Bilha Bekenstein; three children, Yehonadav, Uriya, and Rivka Bekenstein, all of them scientists; his sister, Bella; and six grandchildren.

It was in his doctoral thesis in 1972 that Dr. Bekenstein made his breakthrough.

As both he and Dr. Wheeler later recalled, it all started over tea. What, Dr. Wheeler asked his student, would happen if you poured a hot cup of tea into a black hole?

If the hot tea went into a black hole, it would take its heat and entropy with it, causing its entropy to disappear from the universe, because black holes, according to the prevailing view, were not allowed to have temperature or entropy. That meant the entropy of the universe would decrease, going against the second law of thermodynamics, one



Jacob Bekenstein, third from right, who won the 2012 Wolf Prize in physics, often a forerunner for a Nobel, with recipients in other fields at ceremonies at Israel's Parliament in Jerusalem.

of the pillars of physics and one of the great pessimistic statements of civilization.

The law decrees that entropy or disorder always increases in a closed system, like a car engine or the universe. Whatever you do, you always waste a little energy that cannot be retrieved. This

entropy to black holes, bringing them into the realm of thermodynamic law. "My idea was that when you throw into a black hole some entropy, from a cup of tea for example, the black hole's surface area grows a bit, so the entropy created in the black hole offsets the entropy of the tea and anything else that was thrown into it."

Today Dr. Bekenstein's idea is the cornerstone of attempts to unite quantum theory with Einsteinian gravity, to produce a theory of quantum gravity that can explain what happened in the Big Bang or in a black hole.

Disorder is just lost information, so among its more profound implications is that the amount of information that can be stored in a region of space is determined by the area of a surface surrounding it and not, as one might expect, by the volume inside. This means that a black hole — and perhaps the universe itself — is like a hologram, in which three-dimensional information is encoded on a two-dimensional surface. Physicists are still grappling with what that means for the universe.

Dr. Bekenstein went on to develop what is called the Beken-

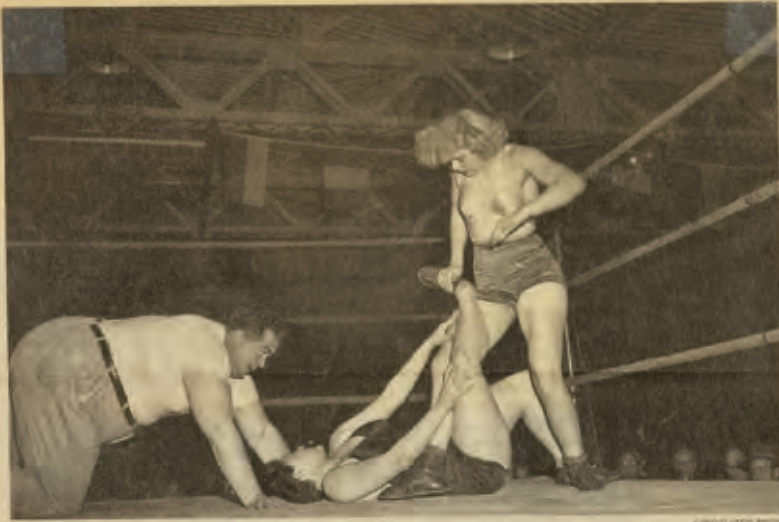
stein Bound, showing that there is a limit to how much information can be packed into a region with finite space and finite energy. Among other things, it suggests that the storage capacity of a human brain, though very large, is finite and at least in principle could be uploaded to a machine.

At a conference commemorating the 40th anniversary of Dr. Bekenstein's discovery, Ted Jacobson, a theorist from the University of Maryland, said, "To end on a note of unbridled hyperbole, we can say that in discovering black entropy, Jacob touched on the origin of all that we see, all that we are, and all that will ever be, and brought it closer to us."

In the Haaretz.com interview, Dr. Bekenstein put it more modestly. "I look at the world as a product of God," he said. His job as a scientist, he added, was to figure out how it works.

"I feel much more comfortable in the world because I understand how simple things work," he said. "I get a sense of security that not everything is random, and that I can actually understand and not be surprised by things."





Mae Young, upright, in a 1943 wrestling match versus Mae Weston. Tiny Basque was the referee.

Mae Young, 90, Who Loved to Be Hated

By WILLIAM YARDLEY

Mae Young — make that the Great Mae Young — who pulled hair and took cheap shots, who preferred actually fighting to pretending, who was, by her own account and that of many other female wrestlers, the greatest and dirtiest of them all, died on Tuesday in Columbia, S.C. She was 90, and her last round in the ring was in 2010.

Her death was confirmed by World Wrestling Entertainment.

"She just was a rough, tough broad," Ella Waldek, another early wrestler, who died last year, once put it.

Stories of her fierceness followed Ms. Young into her first professional match, in 1939. She had learned to wrestle with boys on her high school team in Oklahoma, and played football with them, too.

In professional wrestling, there are baby faces and heels, and she never doubted which one she would be.

"Anybody can be a baby face, what we call a clean wrestler," she said in "Lipstick & Dynamite."

'I've always been a heel,' Young said in a film, 'and I wouldn't be anything else but.'

mite: The First Ladies of Wrestling," a 2004 documentary. "They don't have to do nothing. It's the heel that carries the whole show. I've always been a heel, and I wouldn't be anything else but."

Before thongs and silicone and spray tans made women's wrestling the overtly sexualized spectacle now orchestrated by W.W.E., Ms. Young was among the most famous in a colorful cast of women who first rose to prominence in the 1940s, in part because World War II reduced the number of men who wrestled



Young, left, with the Fabulous Moolah, Lillian Ellison.

professionally. They were known as lady wrestlers, and many people found them hard not to watch.

"When I first started wrestling professionally, the men didn't like the girls," Ms. Young said, "because we would go out and steal the show."

Crowds loved to hate her. Organizers sometimes shielded the ring with chicken wire to help protect her from the rotten eggs and vegetables people would throw. Other wrestlers were intimidated by her techniques and her titles.

By the late 1960s, she had become the National Wrestling Alliance's first national women's champion. In the late 1980s, W.W.E. hired her and her long-time friend Lillian Ellison, better known as the Fabulous Moolah, whom she had trained.

Ms. Young fought much younger wrestlers and starred in campy skits with young male wrestlers that suggested that her prowess went beyond the ring. Some of her older opponents said the work tainted the legacy of women in wrestling. Ms. Young paid no attention.

"This is a business that you have to love, and if you love it you live it," she said in "Lipstick & Dynamite," which was written and directed by Ruth Leitman. "You move along with it. You grow along with the entertainment as it grows."

In 2000, she won the W.W.E.'s

Miss Royal Rumble Bikini Contest, defeating women 50 years younger after removing the top of her bathing suit. In 2004, she was inducted into the Professional Wrestling Hall of Fame. In 2008, she was elected to the W.W.E. Hall of Fame.

Mary Ann Kostecki, an early wrestler who went by the name Penny Banner, recalled meeting Ms. Young.

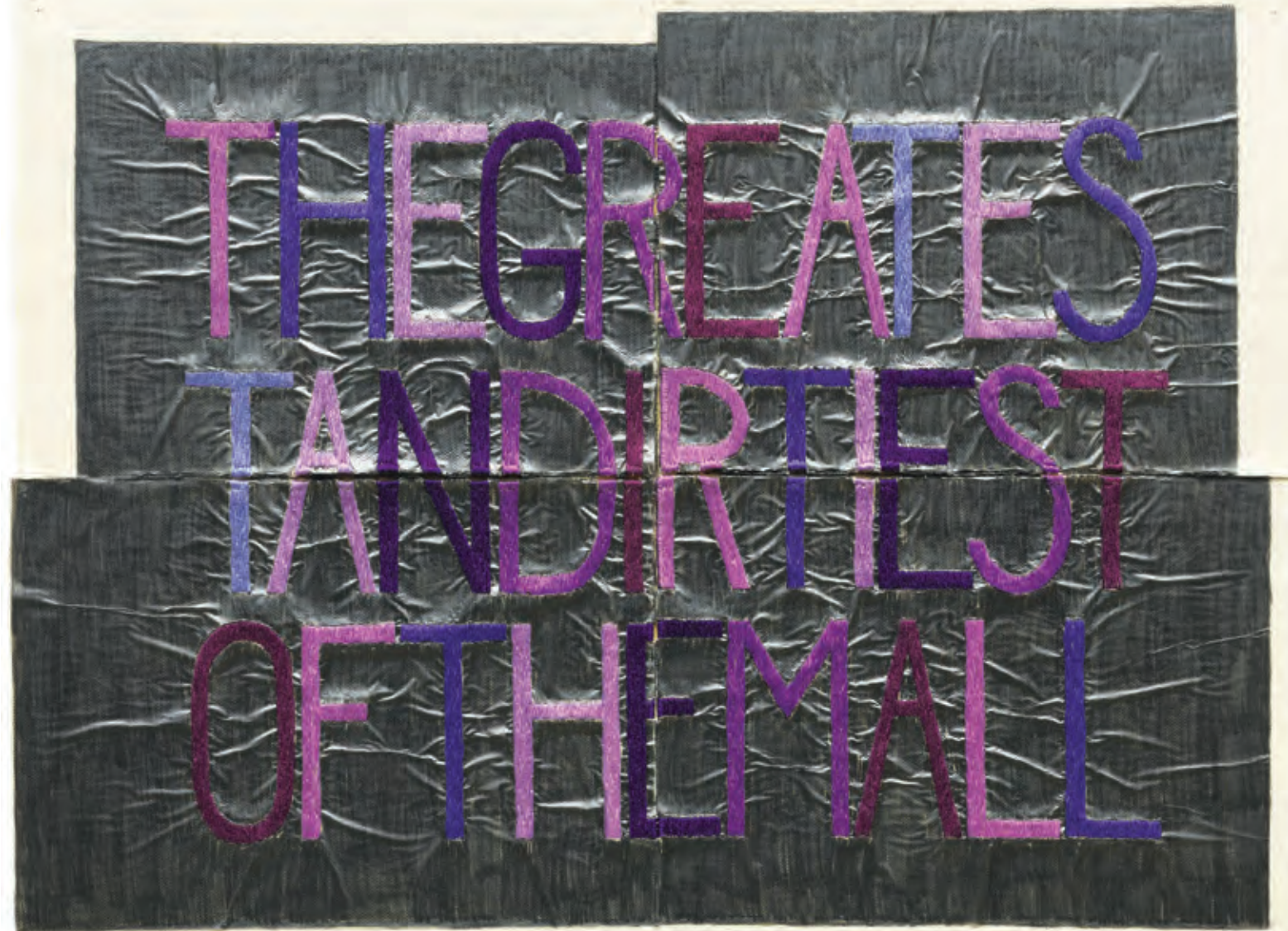
"She had men's shoes on, men's pants on, with the zipper up the front, a cigar hanging out of her mouth," Ms. Kostecki said. "Back in 1954, you didn't do that."

Johannie Mae Young was born on March 12, 1923, in Sand Springs, Okla., the youngest of eight children. Her father left the family when she was young. By the 1940s she was traveling internationally as a professional wrestler, and she spent many years working with Mildred Burke, another prominent wrestler and promoter.

Information on survivors was not immediately available. For several decades, Ms. Young lived with Ms. Ellison and other older wrestlers at a Columbia estate where Ms. Ellison, who was also a successful promoter, trained male and female wrestlers. Ms. Ellison died in 2007.

A citation included with Ms. Young's entry into the Professional Wrestling Hall of Fame quotes an article from The Daily Mail of Charleston, W.Va., on July 22, 1941, about a match Ms. Young wrestled the night before.

"Mae Young, 18-year-old wrestler, headed for Atlantic City Tuesday to fill a mat engagement with boos still ringing in her ears following her Armory match with Ann LaVerne Monday night in the semifinal of the American Legion bill," the article said. "After Miss LaVerne, 20-year-old Croatian girl with a cauliflower ear, had annexed the opening fall in 7:24, her 180-pound opponent ran amok. Miss Young choked Miss LaVerne to win the second fall in 6:03 and got so unmanageable in the third, she was disqualified by referee Laverne Stokes in 2:46."



NYT Jan 18, 2014 p. A18

Raymond Tomlinson Is Dead at 74; He Put the @ in Email Addresses

By WILLIAM GRIMES

Raymond Tomlinson, the computer programmer who in 1971 invented email as it is known today and in the process transformed the “at” sign — @ — from a sparsely used price symbol to a permanent fixture in the lives of millions of computer users around the world, died on Saturday at his home in Lincoln, Mass. He was 74.

His daughter Brooke Tomlinson McKenzie confirmed the death but said that the cause had not been determined.

In the late 1960s and early 1970s Mr. Tomlinson was working at a research and development company, Bolt, Beranek and Newman, on projects for the Arpanet, a forerunner of the Internet that was created for the Defense Department. At the time, the company had developed a messaging program, Sndmsg, that allowed multiple users of a time-share computer to send messages to one another, but it was a closed system, limited to users of a single computer.

Mr. Tomlinson, tinkering code from a file-transfer program he had created called Cpytel, modified Sndmsg so that messages could be sent from one host computer to another throughout the Arpanet system. To do this, he needed a symbol to separate a user name from a destination address. He settled on the plump little @ sign because it did not appear in user names and did not have any meaning in the TENEX paging program used on time-sharing computers.

In 2010, the Museum of Modern Art included the symbol in its architecture and design collection, calling it “a defining symbol of the computer age.”

The Internet Society in Geneva, on inducting him into the newly created Internet Hall of Fame in 2012, honored Mr. Tomlinson for “having brought about a complete revolution, fundamentally changing the way people communicate.”

In accepting the honor, Mr. Tomlinson said: “I’m often asked, did I know what I was doing? And the answer is, yes, I knew exactly what I was doing. I just had no notion whatsoever of what the ultimate impact would be. What I was doing was providing a way for people to communicate with other people.”

Raymond Samuel Tomlinson, known as Ray, was born on April 23, 1941, in Amsterdam, N.Y., northwest of Albany, and grew up in nearby Vail Mills. After graduating from high school, he enrolled in Rensselaer Polytechnic Institute, also nearby, in Troy, where he earned a degree in electrical engineering in 1964.

Mr. Tomlinson pursued graduate studies at the Massachusetts Institute of Technology, where he worked in the Speech Communications Group. He received a master’s degree in 1965 after developing an analog-digital hybrid speech synthesizer.

He joined Bolt, Beranek and Newman (later renamed BBN Technologies and now part of Raytheon) while working toward a doctorate, though he was making much progress. Within a few years the company began working on the Arpanet, developing the first components of what would become the Internet.

He helped develop the Tenex operating system — so called because its paging software extended the memory capacity of the PDP-10 computer — and worked on the Arpanet Network Control System, which provided connectors and flow control between processes running on different Arpanet host computers. On the side, he began tinkering with the



The “@” sign that Mr. Tomlinson used in the first email messages has been called “a defining symbol of the computer age.”

Sndmsg program.

Mr. Tomlinson was careful to note that he was the first to send a “network email,” rather than an email pure and simple. Messages had been sent before within single computers, and in July 1971 the programmer Dick Watson of the research and development company SRI (formerly Stanford Research Institute and now SRI International) had proposed a form of email in which messages would be sent to numbered mailboxes rather than individual users. It was never put in place.

When asked, on the BBN website, why he invented email, Mr. Tomlinson said: “Mostly because

In France, the squiggle is a ‘snail’; in Israel it’s a ‘strudel.’

it seemed like a neat idea. There was no directive to ‘go forth and invent email.’”

Unfortunately for historians, there is no Internet counterpart to the first telephone communication, Alexander Graham Bell’s “Mr. Watson, come here — I want to see you.” Mr. Tomlinson tried his messaging system out for the first time in late 1971, using two DEC-10 computers, made by the Digital Equipment Corporation, standing side by side. They communicated through the Arpanet system.

“I would type the message in on one machine, go to the other machine and examine my mailbox there to see if it had arrived,” Mr. Tomlinson told The New York Times in 2011. “When it finally worked reliably, I sent a message from the development machine (named BBN-TenexB) to all the users in my group on the production machine (BBN-TenexA) describing what I had done, including the @ convention for separating the user name from the host name.”

The content of the a-emails remains unknown. “The test messages were entirely forgettable and I have, therefore, forgotten them,” Mr. Tomlinson told the BBN website.

Mr. Tomlinson’s messaging system was the first “killer app,” David Walden wrote in “A Col-

ture of Innovation: Insider Accounts of Computing and Life at BBN” (2011).

“When it burst onto the scene in 1971,” he added, “it gave the first tangible indication of how far the Internet might go in becoming the ubiquitous anyone-anywhere-to-anyone-anywhere communication system it has become.”

Mr. Tomlinson went on to play an important role in developing the first email standards, including the now-familiar name, date and subject headers atop every email message.

He later worked on a wide variety of complex problems at BBN, notably the “three-way handshake” that lets a computer set up the rules for communicating with a foreign device, such as a modem or printer, and an early workstation system called Jericho.

The “@” sign, meanwhile, assumed a life of its own. It was known as the “commercial a” when it appeared on the American Underwood typewriter in 1884 and was understood to mean “at” or “of the rate of,” as in the ledger notation “rose disp. widge-ets @34 cents ea.”

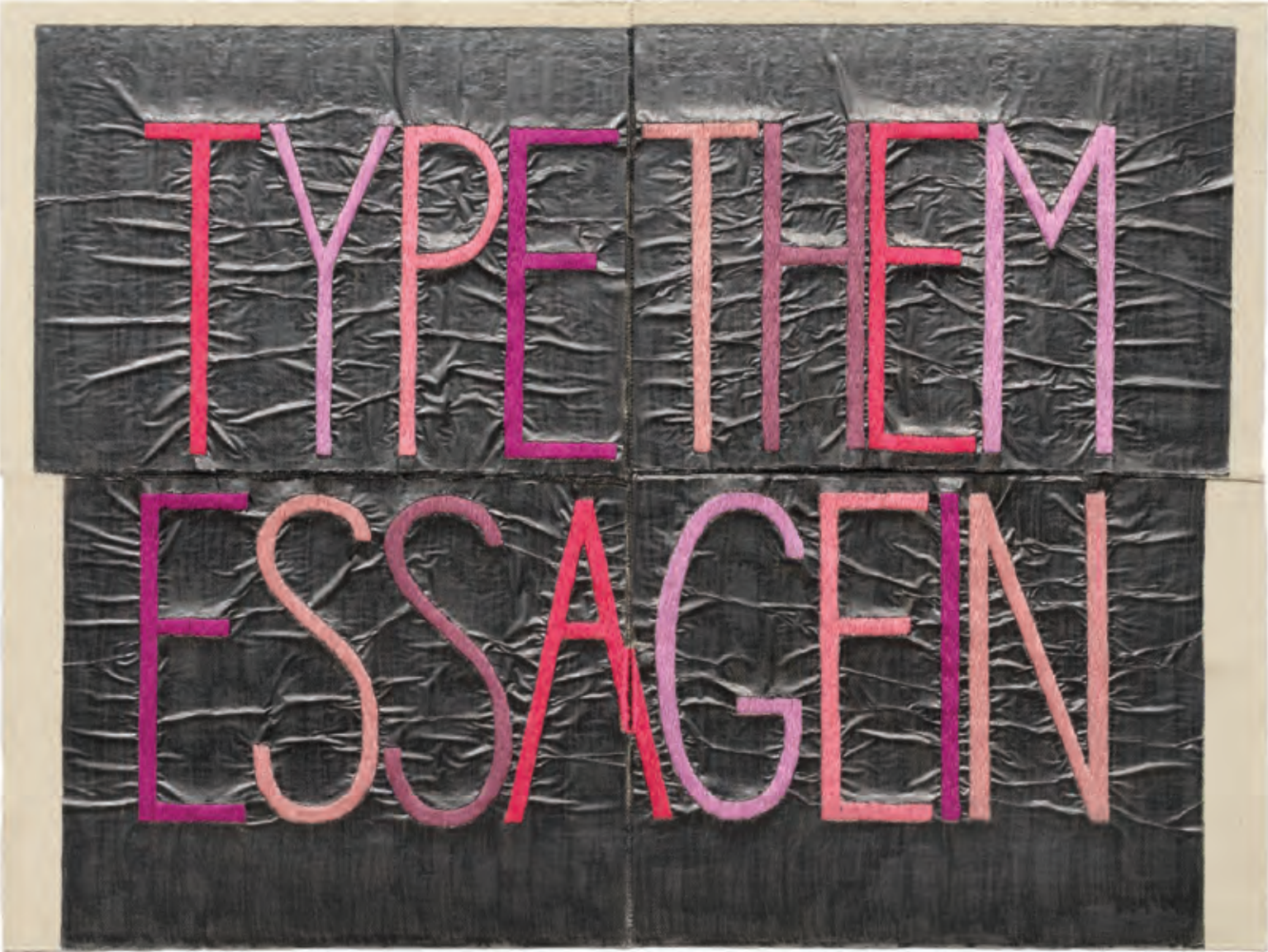
Once introduced into email, it took on a personality, and a variety of pet names. In French and Italian, it is called a snail. Israelis know it as a strudel, and Finns, having decided that it resembles a curled-up cat, call it meikamäki, or “the meow sign.”

In 1999, for the first time in the United States, more electronic mail was being sent than postal mail. According to a report by the Radical Group on global email use, last year over two billion emails were sent every day from 4.35 billion registered email accounts.

Mr. Tomlinson’s first marriage ended in divorce. In addition to his daughter Brooke, he is survived by another daughter, Suzanne Tomlinson Schaffer; two brothers, David and Gary; his partner, Karen Sen; and two granddaughters.

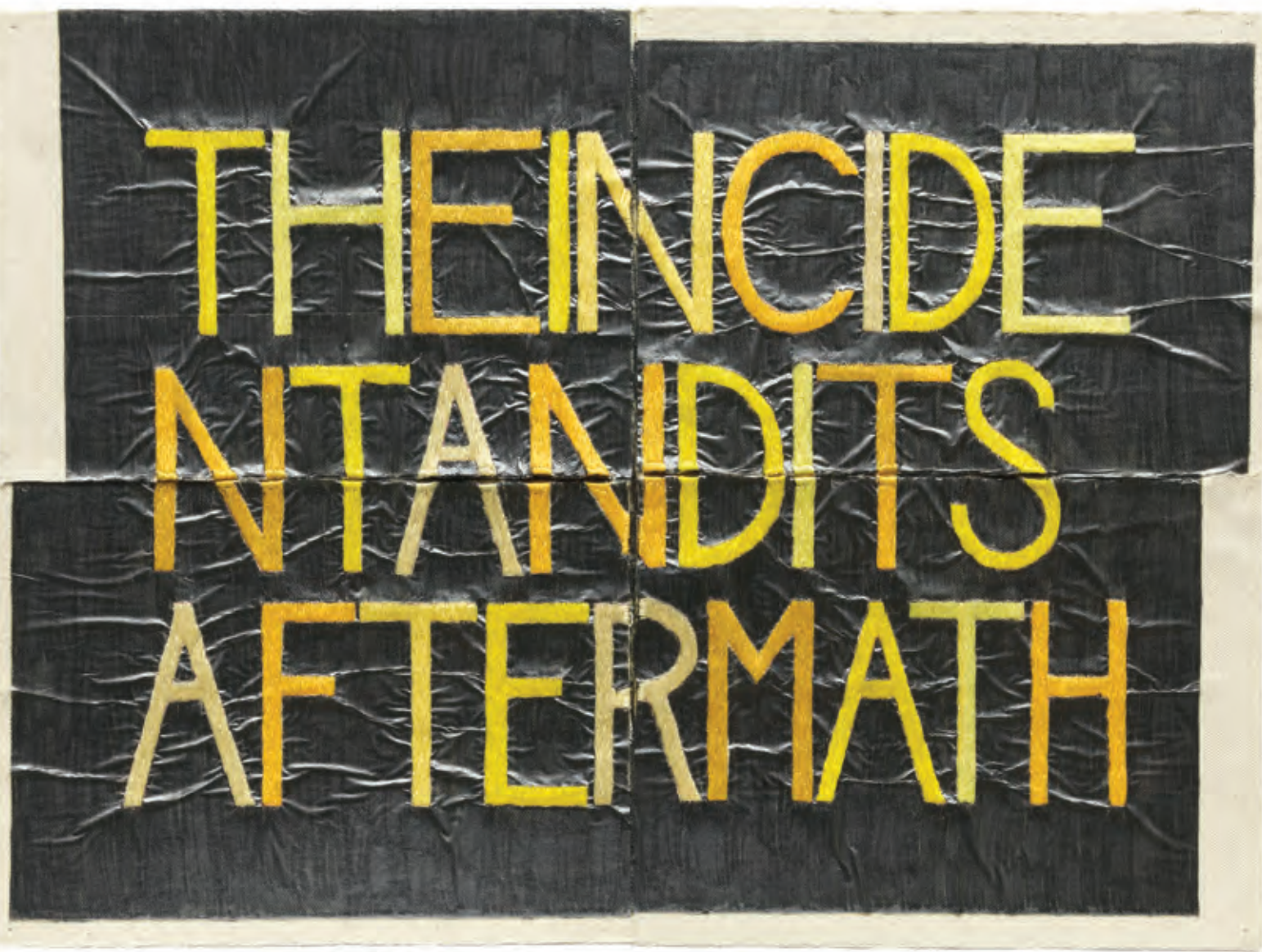
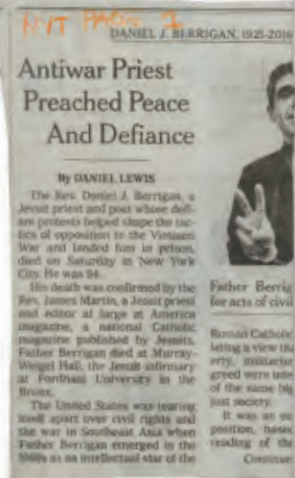
Mr. Tomlinson, who worked for Raytheon at his death, said in a 2012 interview with the web magazine The Verge that he was not particularly surprised, despite the unforeseen reach of email, at the application of his invention.

“I see email being used, by and large, exactly the way I envisioned,” he said.



NYT, March 8, 2016, Raymond Tomlinson, 2017
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches





NYT, May 1, 2016, Daniel J. Berrigan, 2016
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

Luis Posada Carriles, 90, Anti-Castro Warrior, Dies

By FRANCES ROBLES

Luis Posada Carriles, the anti-Castro militant and former C.I.A. operative who made headlines for decades for his failed attempts to topple the Cuban dictator, died on Wednesday in Miramar, Fla., He was 90.

The cause was fluid in his lungs and complications of a stroke he had in 2015, his daughter, Janet Arguello, said.

Mr. Posada spent nearly 60 years on a quixotic and often bloody mission to bring down Fidel Castro by any means possible. He was accused of using bombs and bullets in a crusade that took the lives of innocents but never did manage to snare that Cuban leader, who died at 90 in 2016.

Mr. Posada hopped from country to country, finding refuge in jungles, arming rebels, surviving stints in prison and living on the run off the largess of Cuban exile supporters, then dying a free man at a home for aging military veterans.

"My old tired heart has made enough rounds," Mr. Posada said in a jailhouse interview with The Miami Herald in Panama in 2003. "I'm going to eat my steak, drink my wine and struggle for my country. That will be my life's end."

But others saw it differently.

"He was an international terrorist of the first order," said Peter Kornbluh, the director of the Cuba Documentation Project at the National Security Archive, who spent decades collecting declassified documents on Mr. Posada's ventures.

Luis Posada Carriles was born on Feb. 15, 1928, in Cienfuegos, in central Cuba, one of four children. His father owned a bookstore and printing press.

Mr. Posada attended the University of Havana, a few years behind Fidel Castro there. He worked for a time at the Firestone Tire and Rubber Company, first in Havana and then in Akron, Ohio.

By 1960, Mr. Posada had a prison record in Cuba for anti-Castro activities and was soon working for the Central Intelligence Agency. He almost participated in the Bay of Pigs invasion in 1961, but the mission, a C.I.A.-backed operation, failed disastrously before his plane could take off and take him to Cuba to join fellow Cuban-exile guerrillas there. He later joined the Venezuelan intelligence service, where the Cuban government media said his job was to be a "C.I.A. mercenary."

One of the deadliest events linked to Mr. Posada came in 1976, when a Cubana de Aviación flight exploded off the coast of Barbados, killing all 73 people aboard, including teenagers from Cuba's national fencing team.

A November 1976 F.B.I. report



ALAN DIAZ/ASSOCIATED PRESS

Luis Posada Carriles, at left in 1976. Above in the foreground, he greeted supporters in 2011 after a federal jury in El Paso, Tex., acquitted him of charges of lying to U.S. officials to gain asylum.



ASSOCIATED PRESS

obtained by the National Security Archive showed that a trusted informant had placed Mr. Posada at two meetings where the bombing was plotted.

Living in Venezuela at the time of the attack, Mr. Posada was tried before a military tribunal but acquitted. He remained in prison while prosecutors appealed the ruling, seeking to take the case to a civilian court. But disguising himself as a priest, he escaped.

Mr. Posada always insisted that he was innocent of the airplane bombing — what he called "an abominable deed."

He ended up spending nine years in prison in Venezuela.

"My memories of him are of being a 5- or 6-year-old and visiting him in jail," Ms. Arguello said, adding that she saw little of her father in the decades that followed. "That was the life he chose."

Mr. Posada's next stop was El Salvador, where he participated in the covert Iran-contra affair, in which the Reagan administration secretly sold arms to Iran and used the proceeds to help rebel forces in Nicaragua, or contras. Mr. Posada served as a quartermaster for the rebels.

While in Guatemala in 1990 he

was shot — he presumed by Cuban intelligence operatives; the bullets grazed his heart and tongue and left him with a severe speech impairment.

In an interview with The New York Times in 1998, Mr. Posada was quoted as acknowledging that he had organized a string of hotel bombings in Havana that left one Italian tourist dead and 12 people wounded. He later said he that had been misquoted, and that all he had done was publicize the bombings.

Mr. Posada stayed on the run before reappearing in 2000 in Panama. Mr. Castro, who was in Panama for a presidential summit, stunned the world when he an-

Linked to bombings and plots in a quixotic 60-year mission.

nounced at a news conference that his old foe was in town, trying to kill him. Shortly afterward, Mr. Posada and a group of comrades with terrorism-related records were arrested in Panama City with C4 explosives.

Mr. Posada was sentenced to eight years in prison, but the president, Mireya Moscoso, in her last week in office, pardoned him in 2004. He showed up in the United States a few months later.

"He had that magnetic quality to him that I'm sure explains how he was able to survive all those

years," said Mr. Posada's lawyer, Arturo V. Hernandez. "He was able to establish alliances to help him. You can't do that if everybody hates you."

Exiles sent him money, and they bought his paintings to help him survive. (He had learned how to paint in prison.) They paid bribes to sneak him out of jails and countries and into others.

"He was a charmer," said Santiago Alvarez, a longtime Miami activist who has served time in prison for his anti-Castro efforts. "He had stories for everything. He made you laugh. He was good company."

Federal prosecutors said it was Mr. Alvarez who sneaked Mr. Posada back into the United States in 2005, but both men denied that.

Mr. Posada was charged with lying to the immigration authorities about the bombings and how he had entered the country, but was acquitted in 2011.

A judge ruled that Mr. Posada could not be returned to Cuba or Venezuela, the two countries that eagerly sought his return. So Mr. Posada stayed in South Florida, where he remained estranged from his wife, Nieves, their daughter and a son, Jorge. They survive him. Complete information on survivors was not immediately available.

"I think I did what I had to do," Mr. Posada said in the jailhouse interview with The Herald, in which he renounced terrorism, though he said that he still longed to stomp Mr. Castro "like a cockroach."

"I'm doing what I have to do as a Cuban patriot."



19

NYT June 5, 2019

B15

Louis Levi Oakes, 94, the Last Of the Mohawk Code Talkers

By DANIEL E. SLOTNIK

Louis Levi Oakes, the last of the Mohawk code talkers, who helped American soldiers triumph in the Pacific Theater during World War II, along with code talkers from other tribes, died on May 28 at a care facility near his home on the Akwesasne Mohawk Reservation in Quebec. He was 94.

The death was confirmed by his granddaughter Teresa Oakes.

The code talkers, a group of several hundred soldiers, used their indigenous languages to create impenetrable ciphers as a way of securely relaying vital information on the battlefield. Most of them were Navajos, more than 400 of whom participated in an extensive Marine Corps program.

But code talkers from other tribes, including the Hopi, Comanche and Mohawk, also played a role. Mr. Oakes was one of about 24 from the Mohawk tribe, whose lands are mostly in upstate New York and Canada.

David A. Hatch, the National Security Agency's senior historian, said in an interview on Tuesday that about 30 indigenous languages were used in battle and that about 10, including Mohawk, became the basis for more complicated codes, in which traditional words or phrases became metaphors for matériel. The word for "turtle," for instance, might be used for tank.

Mr. Oakes, who was a technician fourth grade in the Army and served in New Guinea, the Philippines and the South Pacific, never spoke much about his service.

"All he ever told us was that they gave him a piece of paper and said, 'Say this in Mohawk to somebody else on the line,' and he just did what he was told," his granddaughter said.

Louis Levi Oakes was born on Jan. 23, 1925, in St. Regis, Quebec, to Angus and Mary (Porke) Oakes. His Mohawk name was Tahakietakwa, which his granddaughter said roughly translates as "He carries the snow."

He went to high school on the reservation and enlisted at 18. He trained at Fort Drum in upstate New York before moving to a base in Louisiana, where he became a code talker after Army officials learned he was fluent in Mohawk.

Honorably discharged in 1946, he returned to the reservation and would travel to Buffalo for jobs as an ironworker. He married Annabelle Mitchell, who was also a Mohawk, in the late 1940s, and later joined the reservation's public works department.

The efforts of code talkers from other Native American backgrounds have not been as well documented as those of the Nava-



VIA TERESA OAKES

Louis Levi Oakes was a technician fourth grade in the Army during World War II.

Helping Allied forces prevail, but rarely speaking about it.

jo, and less has been known about their contributions to the war effort, although that is changing, Mr. Hatch said.

The code talker program was not fully declassified until 1968, and even then it took decades for the nation to become aware of the contributions of indigenous soldiers in World War II. Their service has since been chronicled in books and in the 2002 film "Windtalkers," which starred Adam Beach and Nicolas Cage. The code talkers also inspired a G.I. Joe action figure, which speaks in both English and Navajo.

In 2001, President George W. Bush presented the 29 creators of the Navajo code with the Congressional Gold Medal, most of them posthumously. Chester Nez, the last of that group, died in 2014.

There are five surviving Navajo code talkers, said Hope MacDonald Lone Tree, a staff assistant to the speaker of the Navajo Council.

In 2008, Congress passed the Code Talkers Recognition Act, and in 2016, Mr. Oakes, along with other Mohawk code talkers, was awarded the Congressional Silver Medal for his service. By then he was the last living Mohawk code talker. Last December, he appeared at the Canadian House of Commons and met with Prime Minister Justin Trudeau.

In addition to his granddaughter, Mr. Oakes is survived by three daughters, Diane Swamp and Dora and Debra Oakes; four sons, Louis, Raymond, Wallace and Joseph; and many grandchildren, great-grandchildren and great-great-grandchildren. His wife died in 2012.

HE CARRIED THE SNOW



NYT, June 5, 2019, Louis Levi Oakes, 2019
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

USE THESE WORDS

13

THE NEW YORK TIMES OBITUARIES MONDAY, DECEMBER 31, 2012

A15

Dr. Rita Levi-Montalcini, Nobel Winner, Dies at 103

By BENEDICT CAREY

Dr. Rita Levi-Montalcini, a Nobel Prize-winning neurologist who discovered critical chemical tools that the body uses to direct cell growth and build nerve networks, opening the way for the study of how those processes can go wrong in diseases like dementia and cancer, died on Sunday at her home in Rome. She was 103.

Her death was announced by Mayor Gianni Alemanno of Rome.

"I don't use these words easily, but her work revolutionized the study of neural development, from how we think about it to how we intervene," said Dr. Gerald D. Fishbach, a neuroscientist and professor emeritus at Columbia.

Scientists had virtually no idea how embryo cells built a lattice-work of intricate connections to other cells when Dr. Levi-Montalcini began studying chicken embryos in the bedroom of her house in Turin, Italy, during World War II. After years of obsessive study, much of it at Washington University in St. Louis with Dr. Viktor Hamburger, she found a protein that, when released by cells, attracted nerve growth from nearby developing cells.

In the early 1950s, she and Dr. Stanley Cohen, a biochemist also at Washington University, isolated and described the chemical, known as nerve growth factor — and in the process altered the study of cell growth and development. Scientists soon realized that the protein gave them a new way to study and understand disorders of neural growth, like cancer, or of degeneration, like Alzheimer's disease, and to potentially develop therapies.

In the years after the discovery, Dr. Levi-Montalcini, Dr. Cohen and others described a large family of such growth-promoting agents, each of which worked to regulate the growth of specific cells. One, called epidermal growth factor and discovered by Dr. Cohen, plays a central role in breast cancer; in part by studying its behavior, scientists developed drugs to combat the abnormal growth.

Groundbreaking work that began with the study of chicken embryos.

In 1986, Dr. Levi-Montalcini and Dr. Cohen shared the Nobel Prize in Physiology or Medicine for their work.

Dr. Cohen, now an emeritus professor at Vanderbilt University, said Dr. Levi-Montalcini possessed a rare combination of intuition and passion, as well as biological knowledge. "She had this feeling for what was happening biologically," he said. "She was an intuitive observer, and she saw that something was making these nerve connections grow and was determined to find out what it was."

One of four children, Rita Levi-Montalcini was born in Turin on April 22, 1909, to Adamo Levi, an engineer, and Adele Montalcini, a painter, both Italian Jews who traced their roots to the Roman Empire. In keeping with the Victorian customs of the time, Mr. Levi discouraged his three daughters from entering college, fearing that it would interfere with their lives as wives and mothers.

It was not a future that Rita wanted. She had decided to become a doctor and told her father so. "He listened, looking at me with that serious and penetrating gaze of his that caused me such trepidation," she wrote in her autobiography, "In Praise of Imperfection" (1988). He also agreed to support her.

She graduated summa cum laude from the University of Turin medical school in 1936. Two years later, Mussolini issued a manifesto barring non-Aryan Italians from having professional careers. She began her research anyway, setting up a small laboratory in her home to study chick embryos, inspired by the work of Dr. Hamburger, a prominent researcher in St. Louis who also worked with the embryos.

During World War II, the family fled Turin for the countryside, and in 1943 the invasion by Germany forced them to Florence. The family returned at the close of the war, in 1945, and Dr. Hamburger soon invited Dr. Levi-Montalcini to work for a year in his lab at Washington University.

She stayed on, becoming an associate professor in 1956 and a full professor in 1958. In 1962, she helped establish the Institute of Cell Biology in Rome and became its first director. She retired from Washington University in 1977, becoming a guest professor and splitting her time between Rome and St. Louis.

Italy honored her in 2001 by making her a senator for life.

An elegant presence, confident and passionate, she was a sought-after speaker until late in life. "At 100, I have a mind that is superior — thanks to experience — than when I was 20," she said in 2009.

She never married and had no children. In addition to her autobiography, she was the author or co-author of dozens of research studies and received numerous professional awards, including the National Medal of Science.

"It is imperfection — not perfection — that is the end result of the program written into that formidably complex engine that is the human brain," Dr. Levi-Montalcini wrote in her autobiography, "and of the influences exerted upon us by the environment and whoever takes care of us during the long years of our physical, psychological and intellectual development."



Dr. Rita Levi-Montalcini in 2007. She discovered chemical tools the body uses to direct cell growth and build nerve networks.

NYT, December 31, 2012, Dr. Rita Levi-Montalcini, 2019
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

A large artwork titled "USE THE SEW WORDS" is displayed on a light-colored canvas. The words are rendered in large, bold, blue, hand-drawn letters. The letters are slightly irregular and have a textured, almost embroidered appearance. The background is a dark, textured surface, possibly a piece of paper or fabric, with a pattern of small, dark, irregular shapes that resemble stitching or a dense, textured pattern. The overall effect is one of a handmade, artistic statement.

DESIGNER (orange)
NYT April 21, 2012

B12

Hillman Curtis, a Pioneer In Web Design, Dies at 51

By PAUL VITELLO

Hillman Curtis, a former rock musician who became a prominent first-generation Web designer and a visionary figure in the Internet's evolution from a predominantly text-based medium to the multimedia platform it is today, died on Wednesday at his home in Brooklyn. He was 51.

The cause was colon cancer, his wife, Christina, said.

Mr. Curtis was the art director of a San Francisco software company in 1996 when he designed the first Web site formatted for a new technology called Flash Player, a browser plug-in that could be used to turn out high-quality animated imagery quickly. Before then the process would take hundreds of hours.

His mastery of the technology, which had been developed for several years before but never fully deployed in a way that unveiled its creative potential, made Mr. Curtis a revered figure in the emerging world of Web design.

His Flash Player design technique set the groundwork for a format that later evolved exponentially to accommodate online advertisements, Facebook applications and video sites like YouTube.

Richard Shupe, who teaches Web design at the School of Visual Arts in Manhattan, said Mr. Curtis's Flash Player design was



Hillman Curtis called himself a serial self-reinventor.

Sagmeister, and a 2010 feature-length film, "Ride, Rise, Roar," chronicling a concert tour by David Byrne and Brian Eno.

He once explained his penchant for reinventing himself in an interview. "I originally went to school for creative writing and film," he said. "I then spent 10 years pursuing music, and, after failing at that, I did various random jobs. I got into design out of desperation — I didn't want to wait tables or pound nails."

David Hillman Curtis was born on Feb. 24, 1961, in the La Jolla section of San Diego. He and two sisters were raised by his mother and stepfather, Susan and Paul Zimmerman, both high school teachers.

As a student at San Francisco State University, Mr. Curtis formed a rock group, later known as the Green Things, which toured for almost a decade and produced one album for MCA Records before disbanding.

Mr. Curtis learned about art and design drawing posters and fliers for his band. After it broke up he took night classes in Photoshop, he told interviewers.

By then, already in his 30s, he had landed a few part-time design jobs before being hired for a low-level position at Macro-media, where he worked his way up to art director.

Besides his wife and mother, Mr. Curtis is survived by a son, Jasper, a daughter, Tess, and his sisters, Madeleine Curtis and Rebecca Curtis-Cassacia.

Long after designing his last Web site, Mr. Curtis remained an important presence in the imagination of Web designers. And professional online journals, which referred to him as "the Michael Jordan of Web design" and "the Grandmaster of Flash," remained fascinated by his decision to give it all up.

"It seems like you had it made," an interviewer said recently on the Web magazine the 99%. "Why did you move on?"

Mr. Curtis answered that he had always wanted to make films and had accomplished his goals as a designer. He detailed those goals in a 2002 interview: "The reason for designing new media is simple — to subtly and quietly change the world."

He mastered Flash Player technology, then walked away.

a milestone that "brought Web design to life." His ability to teach other Web designers, he added, helped "jump-start a process of Web democratization that continues today."

In 2000, Mr. Curtis published a popular how-to book, "Flash Web Design," which sold more than 100,000 copies and remains a standard online design text. Heading his own firm, Hillman-Curtis, which he started in Brooklyn in 1998, he produced Web designs for commercial clients including Yahoo, Sprint, Adobe, Rolling Stone magazine, Fox Searchlight Pictures and the Metropolitan Opera.

His mystique in the design world only deepened when, at the height of his career, he gave up Web work to learn to make movies with a handheld video camera.

For Mr. Curtis, who called himself a serial self-reinventor, it was the start of a third career. A nephew of Chris Hillman, an original member of the Byrds, he had played in a rock band in the 1980s and early '90s before teaching himself Web design.

He was beginning to gain wider notice in his last years for his films, including a 2008 series of short documentaries about designers and artists like Milton Glaser, Paula Scher and Stefan



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HATESYOU•HECARRIESTHESNOW•USETHESEWORDS

Walk through the door. Examine your field of vision. Choose a piece. Get closer. Try to decipher.
Wonder whose life you have chosen.

Imperative Shift

On Ten of Dianna Frid’s *Words from Obituaries*
by Alta L. Price

Pace, timing, and place can be everything. The work you’re seeing has been deliberately slowed down. It is figuratively and literally drawn from longer texts—the printed obituaries are typography, these sewn works are lettering. Neither multiple nor mass-produced, they are both serial and unique. Even when repeated letters are traced over and over, they are then often split, sometimes vertically rent to fit the space at hand, and always striped in tints and shades of varying hues. What at first might look uniform, or like a strictly coordinated practice of categorization, soon grows more complex, messier, and wrinkled around the edges as the graphite on pierced paper puckers up, embellishing the embroidered letterforms.

The visual work on the preceding pages is text—textual, vidual, ritual, actual, factual, contractual, conceptual, eventual, spiritual, virtual, accentual, effectual, intellectual, habitual, perceptual, perpetual. Two nouns plus fourteen adjectives minus several ambiguities equals hmmm. You can try to sort it out, but perhaps this puzzle prefers to remain unsolved.

At first my eye catches specific letters, then it assembles a word here and there, in a repeatedly foiled attempt at decoding a set phrase; finally, I see it. Sometimes it comes in the form of a command: *type the message in; use these words*. Sometimes it’s a straight observation: *there is no return; everybody hates you; he carries the snow*. Sometimes it’s a caption or description: *the incident and its aftermath; the greatest and dirtiest of them all; his last website; another uncanny illusionistic effect*. And sometimes it’s a cliffhanger: *in the time it took to ask the question . . .*

And now I’m asking so many questions, and getting lots of answers, but not all the answers. Let’s take the cliffhanger as an example. Who? “Shakuntala Devi, 83, ‘Human Computer’.” What? “She could give you the cube root of 188,132,517—or almost any other number—in the time it took to ask the question.” Where? “In Bangalore, India.” When? “On Sunday” (April 22, 2013). How? “Through intense practice as a child.” Why? I dare you to try and answer this one.

These are distillations, more than redactions. They result from a process of finding, extracting, and then transcribing and rewriting the words. Each step is a transformation. It’s a distinction as nuanced as the colors now floating before us, forming quandaries, indicating a life’s work, on shiny quadrants of steely grey. What are these colors? Maybe they’re synesthetic biographies, maybe they’re latent prose poems, maybe a rainbow reconfigured. How are these colors? Primary, secondary, and tertiary, perhaps they’re also arbitrary, honorary, or just plain wary. Their existence springs from functional, idiosyncratic classifications determined by the artist’s own rubric. They implicitly point to the absurdity of categorization and its inevitable tendency to omit the essential: esteemed or infamous, no specific life can ever be reduced to a single story; no single, easy explanation can be teased out of an ambitious, polyvalent work of art.

Turning to consider the graphite installations in her Evidence of the Material World series—related to, yet not part of, the Words from Obituaries series—I’m reminded of the artist’s “commitment to ephemerality.” *Ars longa, vita brevis*: the supposed permanence of art and the incontrovertibly fleeting nature of life are reflected back at us here, with vibrant bits of meaning punching through the darkness to jump out at our eyes, tease our minds, and set the gears of meaning into motion.

Returning to the basic questions: Who? You and me and Dianna Frid. What? These pieces, these phrases, these lives. Where? Alan Koppel Gallery, Chicago. When? Friday, September 13, to Friday, November 15, 2019. How? By distillation, intense practice, and a miracle. Why? Let’s let you answer this time.

NYT, June 26, 2003, Fred Sandback, 2014
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, April 26, 2013, *Shakuntala Devi*, 2014
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, August 22, 2015, Jacob Bekenstein, 2014
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, January 28, 2014, Mae Young, 2016
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, March 8, 2016, Raymond Tomlinson, 2017
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, May 1, 2016, Daniel J. Berrigan, 2016
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, May 24, 2018, Luis Posada Carriles, 2018
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, June 5, 2019, Louis Levi Oakes, 2019
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, December 31, 2012, Dr. Rita Levi-Montalcini, 2019
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

NYT, April 21, 2012, Hillman Curtis, 2012
Canvas, paper, embroidery floss, and graphite; 15 x 20 inches

Jacob Bekenstein, Physicist, Dies at 68; Revolutionized the Study of Black Holes

By DENNIS OVERBYE

Jacob Bekenstein, a physicist who prevailed in an argument with Stephen Hawking that revolutionized the study of black holes, and indeed the nature of space-time itself, died on Sunday in Helsinki, Finland, where he was to give a physics lecture. He was 68.

The cause was a heart attack, said the Hebrew University of Jerusalem, where Dr. Bekenstein was the Michael Polak professor emeritus of theoretical physics.

Dr. Bekenstein's greatest achievement came in the early 1970s, when he was a graduate student at Princeton and got into a feud with Dr. Hawking, the celebrated physicist and expert on black holes.

Black holes are the prima donas of Einstein's general theory of relativity, which predicts that space wraps itself completely around some object, causing it to disappear as a black hole. Dr. Bekenstein suggested in his Ph.D. thesis that the black hole's entropy, a measure of the disorder or wasted energy in a system, was proportional to the area of a black hole's event horizon, the spherical surface in space from which there is no return. According to accepted physical laws, including Dr. Hawking's own work, neither entropy nor the area of a black hole could ever decrease.

Raphael Bousso, of the University of California, Berkeley, who was both a student of Dr. Hawking's and a friend of Dr. Bekenstein's, called Dr. Bekenstein's proposition "among the most daring, yet elegant, arguments that I've seen in physics."

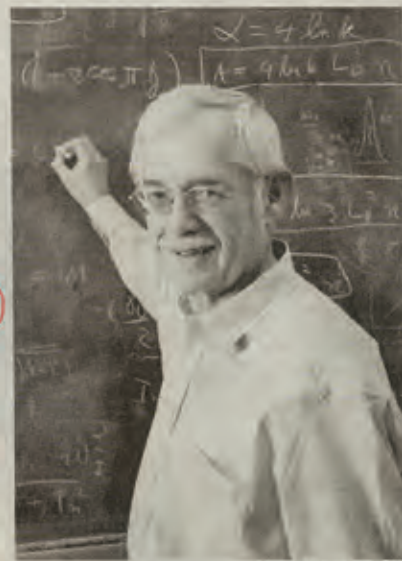
Dr. Hawking denounced the idea. According to classical physics, anything with entropy had to have a temperature, and anything with a temperature — from a fevered brow to a star — must radiate heat and light with a characteristic spectrum. But a black hole could not radiate, and thus it could have no temperature and therefore no entropy.

Or so everybody thought until 1974, when Dr. Hawking did a prodigious calculation including quantum theory, the strange rules that govern the subatomic world, and was shocked to find

particles coming away from the black hole, indicating that it was not so black after all.

Afraid he had made a mistake, Dr. Hawking, as he wrote in his book "A Brief History of Time," kept his calculation quiet at first. "I was afraid," he said, "that if Bekenstein found out about it, he would use it as a further argument to support his ideas about the entropy of black holes, which I still did not like."

He was finally convinced, Dr.



SASSON TIRAM

A Bekenstein theory won over a skeptical Stephen Hawking.

Hawking wrote, when he recognized that the radiation from the black hole would have the same characteristic heat spectrum as heat, just as Dr. Bekenstein's theory had implied.

Today it is called Bekenstein-Hawking radiation, and its discovery is considered a landmark in the quest, so far unfinished, to fulfill the Einsteinian dream of a unified theory of both the gravity that bends the cosmos and the quantum chaos that lives inside of it, so-called quantum gravity.

Dr. Bekenstein received the Wolf Prize in 2012 and the American Physical Society's Einstein prize this year. Both have often been precursors to the Nobel Prize. (The Nobel is not awarded posthumously.)

Lee Smolin, a theorist at the Perimeter Institute for Theoretical Physics in Waterloo, Ontario, said "No result in theoretical

physics has been more fundamental or influential than his discovery that black holes have entropy proportional to their surface area."

Dr. Bousso called Dr. Bekenstein "one of the very few giants in the field of quantum gravity."

Jacob David Bekenstein was born in Mexico City on May 1, 1947, to Joseph Bekenstein, a carpenter, and the former Esther Vladaslavovskaya, a homemaker. Jewish immigrants from Poland, they had met in Mexico during World War II.

Inspired by the launch of the Russian satellite Sputnik in 1957, Jacob and his friends gathered after school to launch rockets.

He became an American citizen in 1968 while attending the Polytechnic University of Brooklyn, now part of New York University, from which he graduated in 1969. He maintained American and Israeli citizenship.

He went on to graduate school at Princeton, gaining a Ph.D. in 1972 under John Wheeler, the teacher and visionary who popularized the term black hole.

After a postdoctoral stint at the University of Texas at Austin, Dr. Bekenstein moved to the Ben-Gurion University of the Negev in Beersheba, where he eventually became chairman of the astrophysics department. In 1990 he joined the faculty of the Hebrew University of Jerusalem.

He is survived by his wife, Bilha Bekenstein; three children, Yehonadav, Uriya and Rivka Bekenstein, all of them scientists; his sister, Bella; and six grandchildren.

It was in his doctoral thesis in 1972 that Dr. Bekenstein made his breakthrough

As both he and Dr. Wheeler later recalled, it all started over tea. What, Dr. Wheeler asked his student, would happen if you poured a hot cup of tea into a black hole?

If the hot tea went into a black hole, it would take its heat and entropy with it, causing its entropy to disappear from the universe, because black holes, according to the prevailing view, were not allowed to have temperature or entropy. That meant the entropy of the universe would decrease, going against the second law of thermodynamics, one



Jacob Bekenstein, third from left, with recipients in 1990 for a Nobel, with recipients in 1990

of the pillars of physics and one of the great pessimistic statements of civilization.

The law decrees that entropy or disorder always increases in a closed system, like a car engine or the universe. Whatever you do, you always waste a little energy that cannot be retrieved. The

Considered 'one of the very few giants in the field of quantum gravity.'

means, among other things, that perpetual-motion machines are impossible.

"So either the second law of thermodynamics is irrelevant or it isn't working," Dr. Bekenstein told an interviewer from the website Haaretz.com in 2012. That was a serious consequence for a law of physics that had served well for 150 years. "I tried to find a way to save it and fix things up."

His solution was to attribute

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