LOS ANGELES, March 11— About 10,000 Americans will their bodies to science each year, choosing a path that, in the popular imagination at least, leads to the clinical dignity of the medical school or teaching hospital, where the dead help to unveil the wonders of human anatomy or the mysteries of disease.

Few donors, it is safe to say, imagine the many other ways corpses give their all for science: mangled in automobile crash tests, blown to bits by land mines or cut up with power saws to be shipped in pieces around the country or even abroad. Few see themselves ending up in a row of trunks, limbless and headless, arrayed on gurneys in the ballroom of a resort hotel for a surgical training seminar.

Nor do many people suspect that corpses are precious raw material in a little-known profit-making industry, and that they are worth far more cut up than whole.

A scandal at the cadaver laboratory at the University of California, Los Angeles, has thrown back a heavy curtain that has kept this business largely hidden from public view.

The university suspended its Willed Body Program this week, and university police arrested the program’s director and a man the university accuses of trafficking in as many as 800 cadavers in a six-year body-parts-for-profit scheme.

The accused middleman, Ernest V. Nelson, who has cut up and carted away hundreds of cadavers from the U.C.L.A. medical school since 1998, said the university had been fully aware of what he was doing. He transferred the human parts, for sizable fees, to as many as 100 research institutions and private companies, including major companies like Johnson & Johnson, his lawyer said.

There is little controversy in the medical community about the use of donated bodies in teaching and research, although few discuss the topic openly and many prefer not to ask where the body parts they use come from.

The parts are supplied by a largely invisible network of brokers who make handsome profits for
processing and transporting human remains. Selling body parts is illegal, but there is no prohibition on charging for shipping and handling. Research doctors say the demand for bodies and parts far outstrips the supply, raising prices and encouraging a growing number of body-parts entrepreneurs. Some of these are companies that promote their "facilitator" services on Web sites emphasizing the great benefit to humanity a willed body provides.

These sites do not mention that a human body, particularly one in pieces, is also of considerable benefit to a broker. Delivery of an intact cadaver costs as little as $1,000, but different specialists seek out specific pieces of anatomy for their work, and individual parts can be expensive. A head can cost $500 in processing fees, according to brokers who handle such parts. A torso in good condition can fetch $5,000. A spine goes for as much as $3,500, a knee $650, a cornea $400. In 2002, a pharmaceutical company paid $4,000 for a box of fingernails and toenails.

"Until pretty recently, it was something everybody kind of knew about but didn't want to talk about," said Dr. Stuart J. Youngner, chairman of the department of bioethics at Case Western Reserve University in Cleveland. "It's icky. It's upsetting. The people who handle these things have been able to get away with stuff because nobody really wants to get into it."

Dr. Youngner added that the interests of medicine and the people who handle the dead, legally or not, have intersected for hundreds of years and have led to recurring scandals. He cited the case of William Burke and William Hare, two Scotsmen of the 19th century whose trade in corpses was so profitable that they graduated to murder to provide fresh bodies to anatomists and university students.

Mistreatment of the Dead

In the last five years, authorities have uncovered numerous instances of mistreatment of the dead. In 1999, the director of the Willed Body Program at the University of California, Irvine, was fired for selling six spines to a Phoenix hospital for $5,000. An investigation discovered that hundreds of bodies were unaccounted for.

The director of the cadaver laboratory at the University of Texas Medical Branch at Galveston was fired in 2002 for selling body parts to a pharmaceutical company and other entities. In 2003, Michael Francis Brown, the owner of a crematory in Riverside County, Calif., was convicted of embezzlement and mutilation of corpses. He received 20 years in prison for illegally removing and selling heads, knees, spines and other parts from bodies he was supposed to cremate. Prosecutors say he made more than $400,000 in the body trade.

Doctors and medical device manufacturers say the use of human remains is indispensable to advancing medical science. There is no substitute, they say, for unembalmed flesh in teaching a doctor how to perform laparoscopic or arthroscopic surgery, or how to repair a heart valve.
But even those who benefit from the knowledge gleaned from work on cadavers say they are troubled by the black market in body parts and the cavalier way many donated bodies are handled.

"The problem is the insensitive and illegal treatment of remains of bodies obtained for medical education and research," said Dr. Todd R. Olson, a professor of anatomy at the Albert Einstein College of Medicine in New York and director of its anatomical donations program.

"A lot of money is changing hands," Dr. Olson said, and there is virtually no regulation of the interstate traffic in body parts. "It is easier to bring a crate of heads into California than a crate of apples. If it's produce, authorities want to know all about it."

Dr. Olson said he believed the majority of university-based cadaver programs were properly run and served a vital function in medical education. But those seeking body parts for profit constantly approach others involved in handling corpses, including licensed funeral directors and morgue workers, and many succumb to temptation. "Whatever you call it, it is theft," he said.

Fresh Cadavers for Training

Many aspects of this tale are chillingly described in an article by Annie Cheney in the current issue of Harper's Magazine. Books, movies and urban myths have explored this grisly trade for years. But the business is rapidly growing and changing.

One of the largest suppliers of bodies and body parts for medical experimentation is the Medical Education and Research Institute in Memphis. The institute conducted 478 seminars last year; 90 percent of them used fresh cadaver specimens.

Janice Hepler, the institute's executive director, said each part of a cut-up cadaver was tagged with a number so that the remains could be reassembled for cremation when research was complete. Staff members accompany body parts to seminars around the country, where they are treated as surgical patients who "are asleep and not dead," she said. The body parts are returned to Memphis, where they are ultimately cremated as a whole person.

The institute works closely with the Methodist Church, funeral directors and hospices to seek donations, Ms. Hepler said. It collects the bodies of 200 donors a year. It charges medical societies $6,000 to $35,000 for training seminars, and the societies pass the costs on to the doctors who attend them.

Last weekend, the institute sent six torsos with heads to a Marriott hotel in Phoenix for a training course purchased by the International Spinal Injection Society, a San Francisco organization that teaches physicians how to inject painkillers into the upper spine. Staff members accompanied the bodies, conducted the training and brought the bodies back, Ms. Hepler said.
The society conducts 14 such cadaver courses a year and requires 90 specimens, a spokeswoman said.

The Memphis operation and several like it, including a Philadelphia company called Innovations in Medical Education and Training and a cadaver transport company called National Anatomical Services, on Staten Island, are the aboveground sector of the industry.

But there is a thriving underground market as well, practitioners say, a direct descendant of the grave robbers who supplied cadavers to doctors and researchers.

The society of those who deal in black-market body parts is a small one, said Vidal Herrera, who has logged more than 30 years in the business of death and dissection. It occasionally comes to light, as it did last November when Federal Express employees at a depot near St. Louis noticed a package leaking what looked like blood. Inside were a human arm and two legs packed in dry ice. The parts were addressed to a freelance body broker, Richard Leutheuser, who operated from his home in suburban Kirkwood, Mo.

"It's no secret," Mr. Herrera said while sitting at a dissection table in his gray, windowless storefront morgue in the San Fernando Valley, north of Los Angeles. "Everybody knows who to call -- the buyers, the sellers, the disarticulators, the schools, the crematoriums. It's a lucrative business."

Mr. Herrera described the business as a world of thugs, hacksaws and back-alley body pickups. He would know. His résumé includes two years with the Los Angeles County morgue; eight years with the Los Angeles medical examiner's office, where he was an investigator; 16 years as autopsy technician with the veterans hospital in Westwood; and 16 years as a freelance dissectionist, performing autopsies and procuring organs and tissue for universities.

For two years, he was the director of the U.C.L.A. Willed Body Program. The world of death is an insular one, he said.

The Role of the Middleman

Mr. Herrera, 51, was embroiled in an earlier scandal at the U.C.L.A. body program. In 1993, he was accused of illegally disposing of human remains that were mixed with medical instruments and animal parts. Though he was the director of the program, hired to come in and clean it up, he was never charged with a crime and the university eventually settled with him for an undisclosed amount for wrongful termination.

In the black market, there are generally three places where tissue, organs and bone can be illegally procured, he said: university programs like U.C.L.A.'s; hospitals and county morgues that perform autopsies; and crematories and funeral homes.

In Southern California, Mr. Herrera said, there are about a dozen middlemen mining these
institutions. These go-betweens play on the worst impulses of technicians who are underpaid, undereducated and often underappreciated, he said.

"It's not a market created by guys like Ernie; he's only serving the medical companies and medical societies," Mr. Herrera said, referring to Mr. Nelson, the accused middleman. "When I started at U.C.L.A., I got at least a dozen calls from these very same guys telling me how the game is played and what the prevailing prices are."

The movement of supermarket beef is "better monitored than human parts," he said. "The demand is greater than the supply, and so the researchers and the doctors at the other end of things don't want to know. They want to have their conference in the hotel, take off their gloves, throw them in a bucket and go home."

A great many ways have been found to supply the growing demand for body parts, Mr. Herrera and others in the funerary business say. With the cost of burial exploding, the next of kin are generally responsive to the pitch of signing over loved ones' remains to disarticulators for medical study.

When legitimate ways cannot be found, Mr. Herrera said, men like Mr. Nelson come calling. Many times, a man with a van is dispatched in darkness to a crematory to pick up boxes of arms and legs and heads. Days or weeks later, he said, "someone is handed an urn of ashes. Who's going to know?"

Relatives of some of those who have donated bodies have been surprised to learn what happened after death. In a class-action lawsuit dating back to 1996, dozens of families are suing U.C.L.A. over how the university handled remains.

Sidney Liroff, who died two years ago this month, willed his body to U.C.L.A. as a gift to science. His widow, Selma, 81, said that she had planned to follow him, even though they are both Jewish and, according to custom, must be buried intact within 24 hours of death.

"We just wanted quietly to do a good thing," Mrs. Liroff said in an interview this week. "We are kept alive by science. Research is a good thing. That's why we did it."

But having learned of the scandal at U.C.L.A., she said, she has no idea what happened to her husband, and she is devastated. "It's ghoulshish," she said, her voice hoarse and crackling. "Imagine the pictures that come up in my mind."

Mrs. Liroff said she had been promised that her husband would be returned to her after research was completed. She wanted to scatter his ashes in a rose garden. But when she called the university she was told by a technician that her wishes could not be accommodated.

"We were married for 57 years," she said. "I just wanted him back."
Photos: Janice Hepler of the Medical Education and Research Institute with a box used to transport cadavers. (Photo by Rollin Riggs for The New York Times)(pg. A1); Donated bodies and body parts are often used for surgical training seminars like the one pictured. Vidal Herrera, a freelance dissectionist, says traffic in body parts is "a lucrative business," and often a shady one. (Photo by Monica Almeida/The New York Times); (Photo by Medical Education and Research Institute); Ernest V. Nelson has been accused of trafficking in body parts. (Photo by Associated Press)(pg. A16)