AV magazine

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2016 | Number 2

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THE LEAP FORWARD

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HUMANE SCIENCE EDUCATION: The Leap Forward

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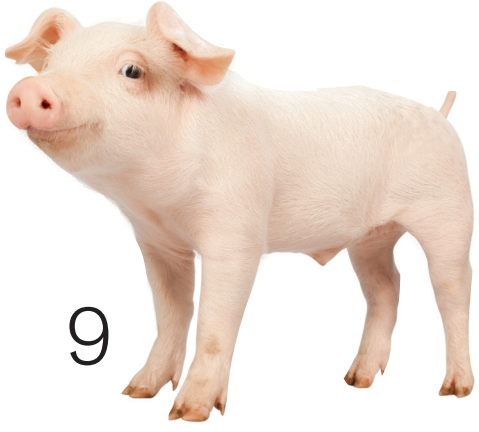

Founded in 1883, the American Anti-Vivisection Society's (AAVS) mission is to unequivocally oppose and work to end experimentation on animals and to oppose all other forms of cruelty to animals. AAVS is a nonprofit education organization using legal, effective advocacy to achieve meaningful, lasting change.

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Executive Editor
Sue A. Leary

Managing Editor and Copy Editor
Jill Howard Church

Staff Contributors
Jill Howard Church
Christopher Derer
Nicole Green
Katherine Lewis
Crystal Schaeffer

Art Direction
Brubaker Design

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Office of Publication:
801 Old York Road, Suite 204
Jenkintown, PA 19046-1611
phone: 215-887-0816
e-mail: editor@theavmagazine.org

www.aavs.org

First Word

AVALON THEISEN, pictured on our cover, is a very special young woman. Two years ago, Nicole Green and Katherine Lewis—the dynamic duo that runs Animalearn and The Science Bank—told me about an outstanding candidate for our 2014 Humane Student of the Year award. They sent me a link to a TEDx talk given by then 12-year-old Avalon, who was an advocate for frogs and had started her own organization, Conserve It Forward (www.conserveitforward.org). I watched her presentation, and was astounded at the poise, confidence, and commitment of this young person. She has since visited the White House, Paris, and elsewhere to speak out on behalf of animals and the environment.

But Animalearn also hears from students who are just as bright and positive as Avalon yet are struggling to find humane learning experiences at their schools. Their heartfelt love of nature is at odds with an outdated curriculum that requires them to suppress their conscientious objection to harming animals.

The world needs young people like Avalon, and they need caring adults who can help them actualize their best selves: smart and compassionate.

The Science Bank, in its 20 years, has helped countless students, parents, and teachers make the smart, compassionate choice for humane science education. The American public supports that choice. In a recent Faunalytics poll commissioned by Animalearn, 75 percent of those surveyed agreed that "students taking biology courses should be allowed to choose alternative methods of learning that do not involve dissecting animals." And yet only 18 states currently have laws guaranteeing student choice.

We're working to change that, with information and experience. We know the problems with using animals in science education, and, importantly, we know the solution: excellent alternatives and the access and support for using them. What's good for the animals turns out to be good for the kids too.

Thank you for caring.

Sue A. Leary

Sue A. Leary, President,
American Anti-Vivisection Society

Briefly Speaking

NEWS YOU NEED TO KNOW

LAB SUPPLIER SHUT DOWN OVER VIOLATIONS

On May 19, the U.S. Department of Agriculture (USDA) entered into a settlement agreement with Santa Cruz Biotechnology (SCBT), following court hearings against the company for "willfully" violating the Animal Welfare Act (AWA). Many of these violations severely compromised the health and well-being of goats and rabbits who were used to produce biological products, generating enormous profits for SCBT. One of the world's largest suppliers of antibodies, SCBT was fined a record $3.5 million, by far the highest monetary penalty ever in USDA history. It also had its dealer license permanently revoked, and agreed to cancel its research license.

USDA inspection reports of SCBT's California facilities documented several goats, typically considered hardy animals, who were so thin that they had "protruding hips, ribs, and spinal processes," while others suffered from broken legs as well as various skin conditions, hair loss, nasal discharge, respiratory problems, and anemia. The most blatant violation was concealing a barn housing 841 goats from inspectors. Although veterinary care was lacking, SCBT managed to continue collecting blood from injured and sick animals to harvest antibodies to sell.

According to a USDA inspection report dated July 2015, SCBT owned 3,202 goats and 2,471 rabbits. Two months later, under increasing pressure, the company had 1,714 rabbits but no goats. By January 2016, SCBT had no AWA-covered animals at its facilities. This curious timing was reported in the journal *Nature* in an article titled, "Thousands of goats and rabbits vanish from major biotech lab." On Twitter, a number of researchers working at prominent labs encouraged scientists to boycott SBCT. Indeed, one of SCBT's high-profile clients, McGill University, announced that it would no longer do business with the supplier. Although the company's future plans have not been made public, its severely damaged reputation will likely persist for some time.

Are Cruelty-Free Cosmetics Possible in China?

There has been much controversy over whether or not it's possible to sell cruelty-free cosmetics in China. To help clarify this issue, Humane Society International (HSI) worked with the expert consulting group REACH24H to produce the "Investigation Report on Regulation Status of Domestic Non-Special Use Cosmetics Related Animal Testing." Released in May, the report concluded what the Coalition for Consumer Information on Cosmetics (CCIC), which administers the Leaping Bunny cruelty-free certification and is chaired by AAVS, has believed: registering cosmetic products for sale in China and staying cruelty-free remains practically impossible at this time.

The China Food and Drug Administration (CFDA) requires all imported cosmetics and new cosmetics ingredients to be tested on animals before they are allowed on store shelves. Also, the CFDA only accepts data from a few non-animal tests, despite the availability of a wide array of globally recognized alternatives.

According to HSI's Troy Seidle, "as many as 500,000 animals are still being used each year around the world in cruel and outdated tests for cosmetic ingredients and products," and more than 375,000 animals were used to meet Chinese testing requirements in 2015.

Upon further research into common regulatory practices in China, the report concludes that "a company cannot provide a 100% assurance of no new animal testing for the Chinese market. New animal testing can still be required or undertaken for new ingredient registration," and the CFDA has the "authority to conduct sampling inspection[s], including animal testing in post-market surveillance," regardless of whether or not data is obtained from animal tests.

However, many scientists and alternatives experts in China are working to promote the use of non-animal methods in an effort to make the use of alternatives the norm in safety testing, not the exception.

PHOTO OF FLO BY NATIONAL INSTITUTES OF HEALTH; ALL OTHER PHOTOS BY ISTOCK

HISTORIC CHEMICAL REFORM BENEFITS ANIMALS

AN IMPORTANT PART OF U.S. POLICY stepped into the 21st century with the passage of a chemical testing reform bill that will modernize safety testing, promote the use of alternatives, and save hundreds of thousands of animals. The Frank R. Lautenberg Chemical Safety for the 21st Century Act, which reforms the 40-year-old Toxic Substances Control Act, was signed into law on June 22, putting safety testing requirements in line with recommendations outlined in the landmark 2007 report, "Toxicity Testing in the 21st Century: A Vision and A Strategy."

The Act's primary purpose is to strengthen oversight of potentially dangerous chemicals, such as pesticides, but it includes remarkably strong provisions to modernize the way testing is conducted, with a mandate and strategy to replace and reduce the use of animals.

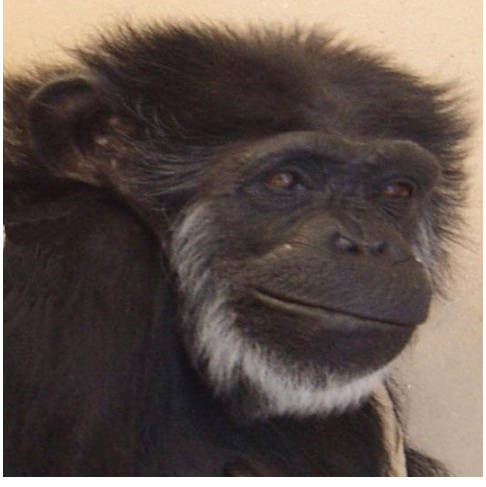
Sen. Cory Booker (D-NJ), the author of the amendment with this new approach, said, "I am proud of the long-overdue improvements I fought to include in this bill, including provisions that strengthen EPA's [Environmental Protection Agency] ability to regulate toxic chemicals…and minimize animal testing."

"Having the Lautenberg Act become a law will stimulate enormous growth in the field of alternatives," said Sue Leary, President of AAVS and its affiliate, the Alternatives Research & Development Foundation. "We've already seen signs that the Environmental Protection Agency is moving forward quickly with implementation of the new law, which will accelerate the move to non-animal testing methods."

Chimps Waiting for Sanctuary

In 2013, the National Institutes of Health (NIH) announced that it was retiring government-owned and -supported chimpanzees, an important change in policy that was welcome news for animal advocates. However, the Government Accountability Office (GAO), ordered by Congress to evaluate NIH's Chimpanzee Management Program, reported that as of last January 15, only 179 out of 561 chimpanzees have been officially retired and relocated to Chimp Haven, the National Chimpanzee Sanctuary. The remaining chimps are at lab facilities in Texas and New Mexico, although they are not being used in experiments.

The report indicates that the delay is because NIH had "not developed or communicated a clear long-term implementation plan for transporting the remaining chimpanzees." Although NIH claims it hasn't developed a plan due to "uncertainties" involving space at Chimp Haven, the report contradicts that, saying "information on space availability in the near and long term is available and could be used and updated as needed to help inform planning."



Flo, who was born in the wild, was used in a circus and for laboratory breeding and testing before she recently died at age 59 without ever reaching sanctuary.

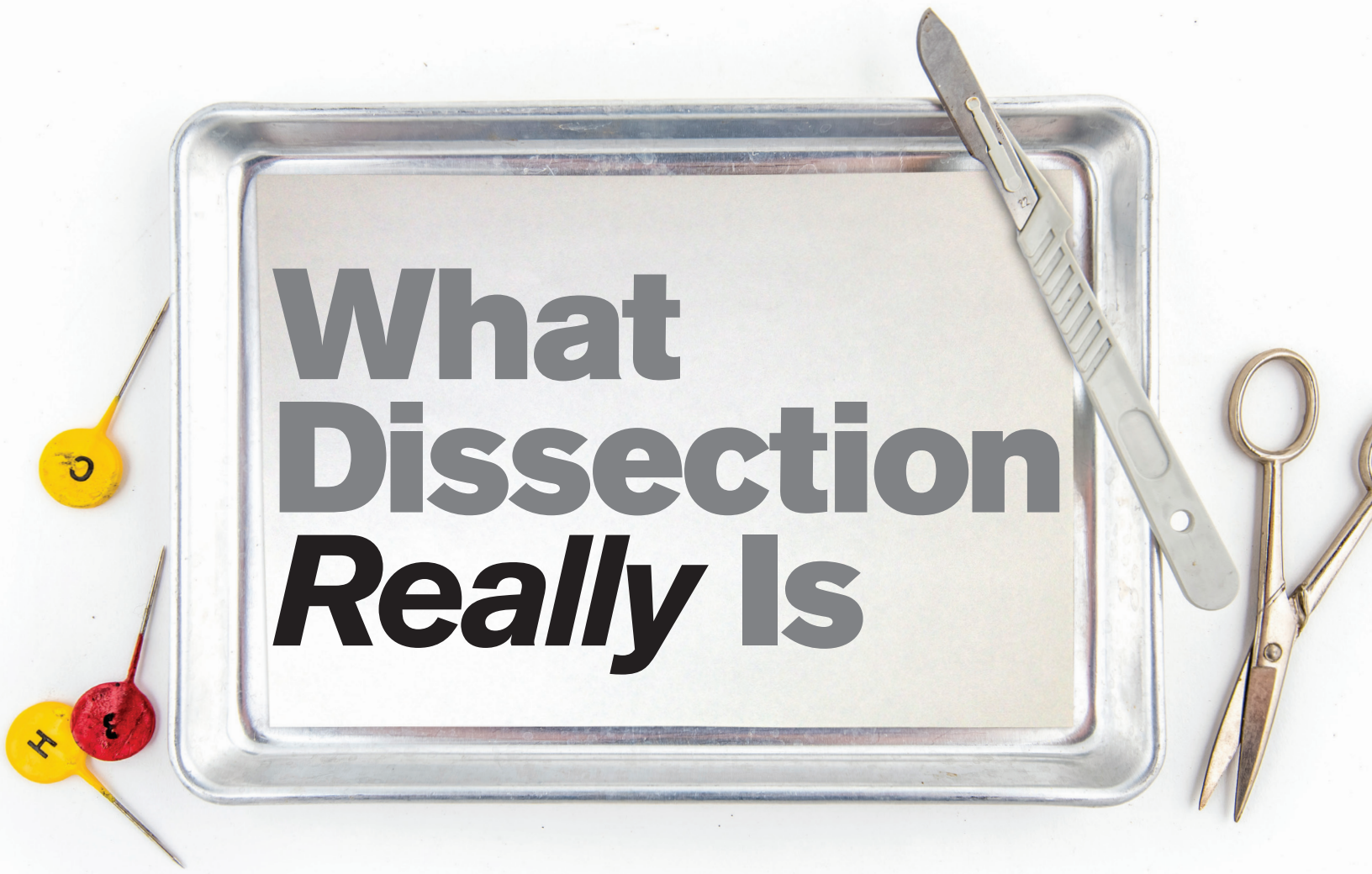
Also at issue is the health of those chimpanzees still waiting, many of whom have been exposed to deadly diseases in research funded by NIH. According to the GAO report, 27 percent of these chimps are infected with HIV or hepatitis, and 38 percent have some other unspecified chronic illness. These chimpanzees range in age from 3 to 57 years; 144 are considered geriatric.

Thankfully, in May, 19 chimpanzees who were transferred from New Mexico to Texas in 2010—a move that began the public outcry that ultimately led to NIH's decision to halt chimp research—finally made it to Chimp Haven.

LAST MED SCHOOLS END SURGICAL TRAINING ON ANIMALS

As the academic year came to a close, the last two medical schools in the U.S. and Canada still using live animals for surgical training announced they are ending the practice. The University of Tennessee College of Medicine Chattanooga and the Johns Hopkins University School of Medicine had been using live pigs, but will now use human-based simulators, which, unlike animals, let students practice surgical skills repeatedly.

Acknowledging that terminal surgeries are "publicly controversial," Hopkins assembled a task force to examine the need for live animals in surgical training, and concluded that they are "not essential to the professional development of a medical student."



What Dissection *Really* Is

BY JAN OAKLEY

THE DISSECTION OF NONHUMAN ANIMALS has a long history, with accounts dating back to ancient Greece where Aristotle used animals in an attempt to map out the structure and function of the human body. Human dissections also date back to ancient Greece, although there were deeply held emotional, moral, and religious concerns about using people's bodies for science that eventually led to a prohibition on human dissection that lasted until the 17th century. Animal dissection, however, continued unfettered during this time, with animal bodies being used as human surrogates, even though vast physiological differences between humans and animals made meaningful science difficult to achieve.

Animal dissection first appeared as a classroom science activity in the 1920s, but it was not until the 1960s that frog dissection became a routine practice in high schools. By the 1980s dissection had become widespread in North American schools, involving the dissection of not only frogs but many species of animals. By the late 1980s a movement of conscientious student objection had begun, alongside the growing animal rights movement and the early development of computerized dissection alternatives. In the decades since, the use of dissection, the development of alternatives, and the prevalence of student objection have all intensified, resulting in dissection being one of the most controversial activities that students are asked to participate in today.

The current culture of North American school science continues to operate within a dissection paradigm; that is, dissection remains commonplace. Studies show that 78-94 percent of secondary science and biology teachers include dissection as part of their curricula, and even higher numbers of students (88-95 percent) say they conducted one or more animal dissections during their schooling years. This translates into an estimated 10-12 million animals dissected each year in the U.S. alone.

Dissection is not, however, practiced worldwide. In Sweden, Germany, and England, dissection is rare in elementary and secondary schools, and five countries—The Netherlands, Switzerland, Argentina, Slovak Republic, and Israel—no longer conduct dissections in schools at all. Changing attitudes toward nonhuman animals and the proliferation of dissection alternatives are pushing schools toward humane science practices, and some schools in North America are following suit by offering students choice in dissection or banning traditional forms of animal dissection altogether. Yet in spite of these progressive steps, deep tensions remain around dissection.

ANIMAL SUFFERING AND DEATH

Dissection causes widespread suffering and death to millions of animals each year. Countless frogs, rats, mice, birds, cats, minks, turtles, rabbits, earthworms, snakes, guinea pigs, crayfish, perch, starfish, crabs, and farmed animals (such

PHOTO BY ROB CARDILLO

as pigs, cows, and sheep) suffer through every step in the processes leading up to their dissection, including the ways they are confined, captured, transported, handled, housed, and killed. Doubtlessly, they experience significant fright, distress, pain, and deprivation throughout. This is compounded by the reality that most animals used for school-based dissections are excluded from or denied protection under any animal welfare acts.

Most carcasses for dissection are purchased from biological supply companies. These companies, constituting a multimillion-dollar industry, profit from the sale of live and dead animals used at all levels of research and education. Yet closed-door policies, weak regulations, and a lack of forthcoming information from the companies point to it being an inhumane industry. One investigation revealed shockingly cruel treatment of animals in biological supply companies, as employees of Carolina Biological Supply and WARD's Biological Supply used hidden cameras to record the companies' day-to-day operations. The undercover video footage documented, among other acts of animal cruelty, cats in crowded wire cages being beaten with metal rods, a dog being lifted off the ground by the neck with a choke pole and dumped into a gas chamber, a rabbit being drowned to death, and rats and other animals being injected with formaldehyde while still alive. In total, the investigators noted 181 violations of the U.S. Animal Welfare Act and 99 violations of North Carolina anti-cruelty statutes during their investigation.

Animals killed for dissection, including those sold through biological supply companies, are procured from various sources. Some are wild-caught from natural environments, others are purchased through breeders or dealers, and others come from shelters, pounds, fur farms, or slaughterhouses. In all instances there are concerns about the animals' mistreatment. For example, one study investigating the treatment of wild-caught frogs bound for dissection revealed that the frogs were being stored in sacks for days at a time with no food or water, and many were crushed, seriously injured, or died during transportation. Another investigation documented numerous violations of animal welfare laws among animal dealers, including a failure to provide the animals with medical care; housing animals in inadequate, unsafe, and unsanitary conditions; and falsifying records. A third study exposed a business of illegal cat collection in which dealers known as "bunchers" sold lost, stray, or abandoned cats from streets and shelters in Mexico to American biological supply companies. In some instances, stolen or unclaimed pets ended up on students' dissection trays.

DISSECTION RISKS IMPARTING IN STUDENTS AN ATTITUDE OF CALLOUSNESS AND DISREGARD FOR ANIMAL LIFE.

The treatment of animals in factory farms also connects to the business of dissection, as this is the industry where fetuses are cut from the bodies of pregnant pigs after slaughter and other animals are dismembered to sell body parts to schools. Animals housed in factory farms endure extreme, lifelong physical and psychological distress as a result of intensive confinement. Denied many of their basic needs, including the ability to access the outdoors, move around freely, procure their own food, or raise their young, these animals suffer greatly as they are turned into commodities. Although most people believe animals are sentient beings with intrinsic value, their suffering and deaths are seemingly inconsequential to the industries that deal in killing them for profit.

DISSECTION'S HIDDEN CURRICULUM

Education is a socializing process where values and social norms are communicated, intentionally and unintentionally. The "hidden curriculum" refers to all of the additional information that students pick up without being explicitly taught; through it, students learn what attitudes, perspectives, and beliefs are appropriate to hold.

Dissection's hidden curriculum teaches lessons about the ethics of animal use: specifically, that there is little value in animal life. Although its stated intent is to teach students about biology, dissection ultimately teaches students that it is ethically acceptable to kill animals in the name of school science and, as [author and professor Steve] Sapontzis writes, "that animals can be killed for trivial purposes, for example, just for curiosity or just because it has become traditional to kill animals on these occasions." Modeling exploitative human-animal relations, dissection sends students the message that in Western science, human interests take priority over animals' lives. It also teaches that harmful animal use is ethically acceptable in science, even in routine classroom situations that will not result in new scientific knowledge and where humane alternatives could easily be substituted.

The social implications of these "lessons" are serious; dissection risks imparting in students an attitude of callousness and disregard for animal life. Studies have shown that classroom dissections can degenerate into a mutilation activity: students have been observed throwing frogs around the classroom, plunging dissection tools into pigs' heads and bodies, and decapitating animals and parading their heads around the classroom.

These acts of disrespect to animals' bodies arise in a framework in which students internalize the message that animal life does not matter, and that compassion and personal responsibility toward animals is unnecessary in science. **AV**

Excerpted from Animal Dissection in Schools: Life Lessons, Alternatives and Humane Education *(Animals and Society Institute, 2013). Jan Oakley, Ph.D., is an Adjunct Professor in the Faculty of Education and a sessional lecturer in the Department of Women's Studies at Lakehead University in Thunder Bay, Ontario. Reprinted with permission from the Animals and Society Institute (www.animalsandsociety.org).*

The Science Bank

A Look Back + a Leap Forward

BY NICOLE GREEN AND KATHERINE LEWIS

TWENTY YEARS AGO, Animalearn made its mark in the field of science education by launching The Science Bank (TSB), a free materials loan program that provides humane alternatives to traditional animal dissection exercises. Our goal was to reduce and eventually eliminate the use of dead animal specimens, and instead nurture better understanding and respect for all creatures—what we consider to be the real essence of learning about the natural world.

Alternatives were relatively unknown at that time; only a handful of companies had developed non-animal science education resources. But today The Science Bank offers more than 650 high-quality science education products ranging from physical models to state-of-the-art computer technology. Over two decades, our loan program has served thousands of students and teachers, and has grown to be the largest such repository of humane science alternatives in the United States.

SUPPLYING THE DEMAND FOR CHANGE

In the 1980s, the long-standing practice of animal dissection suddenly became a topic of national conversation. A growing awareness of animal use and welfare prompted students to voice their objections and assert their right not to dissect. High school student Jenifer Graham's court case in California ultimately resulted in passage of a student choice law that gave K-12 students there the right to opt for humane alternatives without penalty.

Veterinary and medical students faced similar challenges. In 1987, with support from AAVS and other animal protection groups, two veterinary students filed a lawsuit against the University of Pennsylvania over their right to refuse required terminal surgeries on healthy dogs. The students prevailed, which sent a strong message to other veterinary schools regarding student choice.

In 1992, AAVS published *Vivisection and Dissection in the Classroom: A Guide to Conscientious Objection*, by attorneys Gary Francione and Anna Charlton. This book was an important resource to help guide even more students who wanted to take a stand. That same year, the Pennsylvania Student Rights Option passed, again with AAVS involvement and support, giving elementary through high school students the right to use humane alternatives to vivisection and dissection.

A national telephone hotline (1-800-922-FROG) was established by the Animal Legal Defense Fund for students looking for information about alternatives to animal dissection. In the first two years of its existence, the hotline received more than 16,000 calls from parents and students.

This growing demand led Animalearn to launch The Science Bank in 1996. In that year's *AV Magazine*, "Dissecting Dissection," AAVS asked members to contribute to the development of the lending library, which they enthusiastically did. The Science Bank also received donations from companies including A.D.A.M. (Animated Dissection of Anatomy for Medicine), Science Works, and Ventura Educational Systems. By December 1996, enough members and companies had contributed to TSB so that the lending program had more than 100 alternatives, including models, charts, and computer programs for frogs, fetal pigs, rats, fish, invertebrates, and humans.

OUTREACH TO TEACHERS

In an effort to educate teachers about dissection alternatives available from The Science Bank, Animalearn staff began attending the National Science Teachers Association (NSTA) and the National Association of Biology Teachers (NABT) national conferences in 1996. Our resources received a lot of attention, since there was (and still is) an overwhelming presence of pro-animal-use industries and institutions within teachers' organizations.

Animalearn also began hosting workshops at education conferences. Our first exhibitor workshop at NSTA, "Preparing Students for a Career in the Medical Field: The Dissection Controversy," was held in 1997 and included a panel discussion with a high school student, a doctor, and a veterinary

PHOTO BY ISTOCK (THIS PAGE) AND ROB CARDILLO (OPPOSITE)

professional. The workshop was significant enough to prompt a short article, "Controversial Cutups," in the periodical *The Scientist*. It was clear that our presence at these events was not welcomed by everyone, since we challenged the widespread practice of dissection.

Animalearn continues to introduce teachers to new products and new ways of looking at dissection and anatomy. Today our workshops encourage educators to "Leap into the Future with Hands-On Science Teaching." In a sea of workshops that offer the same old specimen dissections, our events give teachers the opportunity to try a variety of non-animal alternatives at different learning stations so that they can familiarize themselves with the many innovative products available to them and their students.

Animalearn has also broadened our outreach to other conferences, to promote humane science teaching tools. Our staff has attended meetings of the National Education Association, the Human Anatomy and Physiology Society, the Green Schools Conference & Expo, the Association for Supervision and Curriculum Development, the International Society for Technology in Education, and many state and local science educator conferences. It is important for us to be a presence at these venues, providing personal attention to teachers who otherwise will only be exposed to for-profit companies that sell dead specimens. At this year's NSTA Convention in Nashville, our Animalearn booth was right down the aisle from a biological supply company offering free specimens. Many science teachers who visited our booth remarked about how different we are, and applauded us for having a positive presence at this event.

BUILDING ALLIANCES

Partnerships and alliances with like-minded individuals, organizations, and companies have been instrumental to The Science Bank's influence in the field of science education.

In 2007, to address the growing need for student choice policies at the college level, Animalearn collaborated with Lynette Hart, Ph.D., a professor at the University of California, Davis, on an analysis of student choice policies regarding dissection in colleges and universities. The study examined attitudes of faculty and students, and pointed to successful strategies for progress. A year later, Hart's book, *Why Dissection? Animal Use in Education* included The Science Bank loan program, and discussed Animalearn's role in helping teachers navigate the difficult process of replacing inhumane methods of teaching with more positive alternatives to dissection.

Another important facet of our program has been to collaborate with companies that develop alternatives, so that we can promote their use and encourage schools to purchase these amazing teaching tools for their classrooms. From the beginning, Animalearn has worked with these companies to make their products more available through TSB loans.

This year, with the launch of our new Science Bank web hub (www.theScienceBank.org), we further highlight companies that have been longtime partners, such as Froguts and Digital Frog, as well as newer companies that have created innovative technologies that can replace animals used in science education, including SynDaver and Anatomy in Clay®.

EVOLVING TECHNOLOGY

The nature of the alternatives themselves has changed dramatically since The Science Bank began. In the late 1980s and early 1990s, what few existed

Katherine Lewis connects students and teachers with hundreds of humane teaching materials from The Science Bank.

TSB **FAQ**

NUMBER OF ALTERNATIVE PRODUCTS AVAILABLE FOR LOAN
650+

GRADE LEVELS FOR PRODUCTS
K-12 through college and graduate school

MOST POPULAR ITEMS
Digital Frog 2.5, followed by Realistic Frog Models, Simulated Frog Dissection Kits, and Pregnant Cat Models

HOW FAR AHEAD TO ARRANGE A LOAN
Ideally four weeks, but usually TSB can accommodate more urgent requests as well.

PROCESS FOR ARRANGING LOAN
Go to www.thesciencebank.org; select type of animal, education level, medium, subject, or supplier; review available products; select product and quantity; and check out by creating an account. The loan itself is free, but TSB requires a credit card number as a security deposit in case of damage or loss.

RAPID CHANGES IN TECHNOLOGY HAVE BROUGHT A GREATER RANGE AND SOPHISTICATION OF SIMULATED DISSECTION RESOURCES.

Animalearn Director Nicole Green travels to education events across the country to teach parents, students, and teachers about humane alternatives to dissection.

were limited to videos, charts, and a handful of plastic models. Computer software was new, so the programs that were available were on diskette and, eventually, CD-ROM.

Rapid changes in technology have brought a greater range and sophistication of simulated dissection resources. In the early 2000s, a company called Neotek created a one-of-a-kind program that gave teachers the opportunity to wear 3D glasses and "dissect" a variety of animal specimens. Today a company called zSpace offers a virtual reality simulation that allows students to explore numerous human and animal systems. [To learn more about these innovations, see page 10.]

Some new alternatives can also be used on smaller and more streamlined devices, such as iPads, which in many cases means no more CD-ROMs or DVDs. Today many companies offer online subscription services or links/codes that bring users to a site that can be accessed for a certain time period. Online subscriptions allow an entire classroom or school to have easy access to a program, which makes it easier for science educators looking for non-animal materials for all of their students and not just one or two individuals.

We continue to recommend physical models as a supplement to technology in science class, and they also have evolved and become much more lifelike. There was a time when the large plastic Great American Bullfrog was one of the best models available, but today, with realistic dissectible frog models such as the Vet Effects Frog Dissection Training Manikin made from a rubbery synthetic material, the hands-on learning tools offer much more detail. 3D printing is another emerging field that has the possibility of creating more groundbreaking innovations for non-animal modeling. The rapid increase in the number of alternatives now available reflects the higher demand for these kinds of products from students, teachers, and the greater science education community.

READY FOR THE FUTURE

The state of alternatives to animal use in science education is better than ever today. Even biological supply companies, whose main business is selling thousands of live and dead animals to schools, now offer a variety of non-animal teaching tools as well. Advancements in technology have brought new and innovative mediums into the science classroom. Many schools are integrating laptops, tablets, and other devices that encourage creativity and critical thinking skills for looking at scientific problems. Non-animal alternatives and the companies that make them are no longer dismissed as substandard; many are now accepted and appreciated as the excellent learning tools they are, and not just regarded as supplemental to a specimen dissection.

One outstanding example of progress made in science education came in 2012, when NABT and Froguts established a partnership to extend the reach of this humane teaching tool. Featured at the 2013 NABT Professional Development Conference, their alliance provided an incentive to teachers to utilize the Froguts products. This was truly a significant leap forward for NABT, an organization that once disavowed dissection alternatives.

It's been gratifying to see the greater development and acceptance of more humane options within the science education community, and more legal policies and laws put into place to protect students who want to learn about animals without harming them. However, many schools and teachers still routinely use live and dead animals to teach anatomy and physiology, and kind students are still pressured to participate in exercises that harm animals. That is why The Science Bank still plays a vital role: working tirelessly to assist compassionate students and to bring high-quality resources to science educators who may not realize that non-animal methods can be excellent means for putting the life back in life sciences. **AV**

Nicole Green, M.A., is the Director of Animalearn and travels often to make educators aware of humane educational materials. Katherine Lewis, M.A., is Animalearn's Associate Director, as well as Vice President of her local school board.

PHOTO BY ROB CARDILLO (THIS PAGE) AND ISTOCK PHOTO (OPPOSITE)

CATS

Cats have been domesticated for about 4,000 years. Early Egyptians worshiped a cat goddess and even mummified cats for their journey to the next world. Once valued for their hunting abilities, cats are now cherished for their companionship and loving behavior–and internet videos! Cats use many vocalizations to communicate, including purring, trilling, hissing, and several different forms of meowing.

MINK

Mink are mostly solitary, quiet, and independent nocturnal mammals. They usually inhabit woodsy forest areas, especially those that are close to water sources such as ponds and rivers. They are semi-aquatic and have webbed feet, which makes them excellent swimmers. Their dense underfur is protected by oily guard hairs that help waterproof their coats. Like other members of the weasel family, mink possess anal scent glands whose liquid has a strong smell and is used for finding mates and for communicating territorial boundaries.

NOT A SPECIMEN!

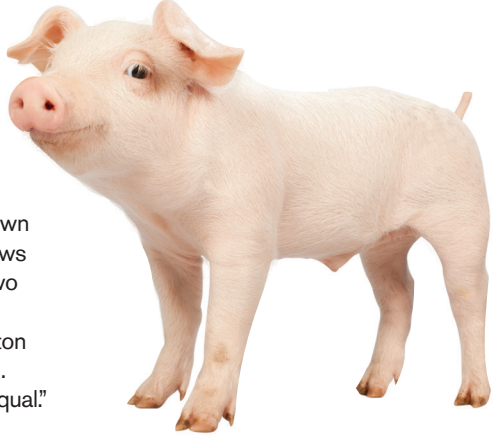
Approximately 10-12 million animals are used for dissection exercises in the United States. Frogs and fetal pigs top the list of species, but many other animals are also used. These are animals–uniquely adapted species and individuals with their own characteristics, strengths, needs, and wants. Here is a glimpse into their natural worlds, beyond the dissection lab.

DOGFISH SHARKS

Spiny dogfish sharks are small sharks who live close to the sea floor in the temperate continental shelf worldwide. They are gregarious and travel in large schools, which are sometimes segregated by sex and age. They are called "dogfish" because they travel and hunt in packs. They also migrate, following cool waters. Spiny dogfish have an 18- to 22-month gestation period, which is among the longest of any animals. Due to their late sexual maturity, small litter sizes, and long gestation, spiny dogfish sharks are vulnerable to overfishing but otherwise can live up to 25-100 years.

FROGS

There are more than 4,750 different varieties of frogs in the world today. Unfortunately, frog populations have been declining worldwide at unprecedented rates, and nearly one-third of the world's amphibian species are threatened with extinction. Most frogs require a suitable habitat in both terrestrial and aquatic environments. Since frogs have permeable skin that can easily absorb chemicals, the health of frogs in a habitat can be an indicator of the well-being of the entire biosphere.

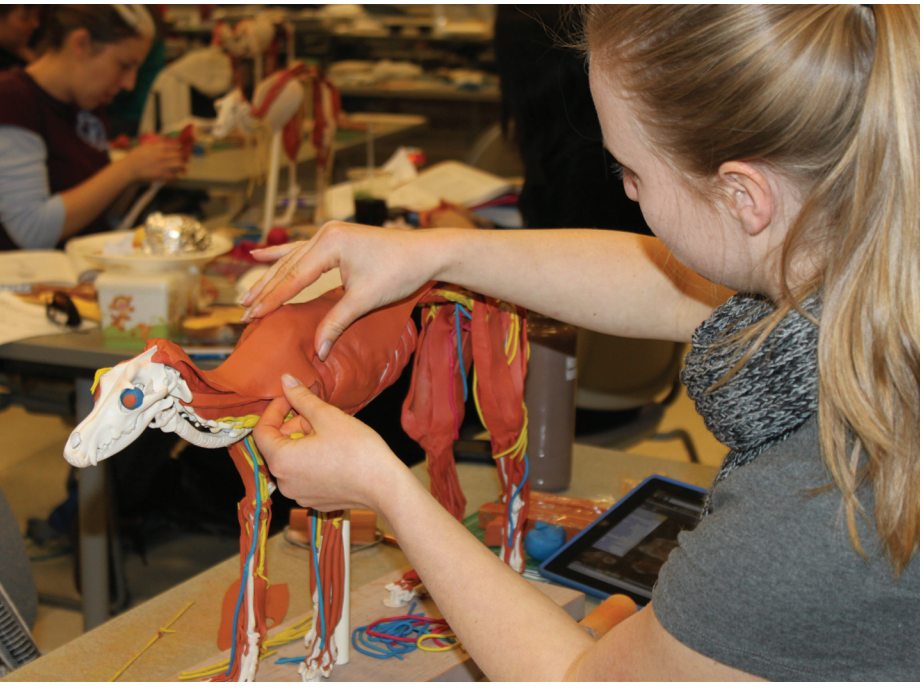


PIGS

Pigs are highly intelligent, curious animals who engage in complex tasks and form elaborate, cooperative social groups. Wild pigs, from which domestic pigs are derived, live in small, matriarchal groups known as sounders, consisting of two to six sows and their young. When sows give birth, they will stay in their nest with their litter for about one to two weeks, which fosters the development of strong family bonds. A wild pig can live from four to 20 years. Former British Prime Minster Winston Churchill was fond of pigs and reportedly said, "Dogs look up to man. Cats look down to man. Pigs look us straight in the eye and see an equal."

The Non-Cutting Edge

By Jill Howard Church



Classrooms and learning tools are going increasingly high-tech, which is a good thing when it comes to efforts to replace animal dissection specimens with humane alternatives. Several companies are on the forefront of this non-cutting edge, with increasingly sophisticated and innovative approaches to teaching science.

zSPACE

A sleek stylus replaces the scalpel in the virtual reality exercises produced by zSpace, based in California and supported by a mostly female team of education specialists. Its interactive hardware and software, including special 3D glasses (think Google Glass meets Ray-Bans), let students explore concepts and manipulate complex images in lessons related to life science, physical science, social science, and Earth and space science.

The entire product catalog, which runs on a Microsoft platform, contains hundreds of 3D models of cells and whole or partial animals (human and nonhuman) and plants for studying anatomy, biology, botany, zoology, chemistry, and more. In biology, for example, students can conduct virtual frog dissections, focusing on the circulatory and digestive systems, or learn about rat anatomy or the unique characteristics of different species of fish.

Using technology originally developed for the U.S. Department of Defense, the applications come with standards-based activities and support materials for STEM (science, technology, engineering, and math) classes in grades K-12.

Watch demonstrations of 3D lessons at www.zspace.com.

ANATOMY IN CLAY®

Modeling clay might not seem very high-tech when it comes to studying science, but the delight is in the details. Fine artist Jon Zahourek began creating clay anatomy models in the late 1970s, and has since developed unique teaching tools for students in middle school through medical school. Today his company, Anatomy in Clay®, makes intricate whole-body models of dogs and horses, as well as disarticulated limbs for each.

Using both human- and animal-based models, students "build" limbs or entire scaled-down bodies using colored clay to replicate muscles, tendons, veins, arteries, nerves, and lymphatic systems. The materials can also be used to construct models of entire cardiovascular, digestive, and nervous systems.

This tactile approach to understanding anatomy from the inside out—rather than the usual dissection practice of cutting from the outside in—gives students a unique understanding of both form and function.

Zahourek also founded the Formative Haptics program (www.formativehapticscenter.org), a nonprofit foundation based in Denver that offers intensive anatomy training and related educational events using Anatomy in Clay® models.

See the animal- and human-based models at www.anatomyinclay.com.

CANIKEN® PHOTO COURTESY OF ANATOMY IN CLAY® (THIS PAGE); COURTESY OF ZSPACE AND SYNDAVER LABS (OPPOSITE)

SYNDAVER LABS

It's not an oxymoron to say that the synthetic cadavers produced by SynDaver Labs are astonishingly lifelike. These simulated bodies evolved from work conducted at the University of Florida in 1993 to develop trachea models that would replace live animals used to test intubation devices. By 2004, SynDaver Labs was creating highly detailed synthetic human body parts for the medical device industry. Its current range of products includes full-size human models that bleed, breathe, and feature fully articulating joints, more than 600 replaceable muscles, and over 300 composite bones, as well as organs and blood vessels. The models contain synthetic nervous system components, arterial vasculature, reproductive organs, and complete digestive and urinary tracts. A wide range of individual body parts and organs can be used to train medical professionals to perform such procedures as craniotomies and heart valve replacement.

SynDaver's products (which include a new canine model for veterinary students) are used by universities, the U.S. Food and Drug Administration, the U.S. Product Safety Commission, and all branches of the Armed Forces. Some models work in conjunction with a computer interface that can be used to regulate the synthetic body's functions. They may cost close to an arm and a leg—some around $40,000—but if you're on a budget, you can literally buy just an arm or a leg. Photos and descriptions are available at www.SynDaver.com.

The technology being developed to replace the use of animal specimens is advancing in tandem with the ethical concerns that are hastening such progress. Whether the goal is to teach basic anatomy or advanced clinical training, these specialized products are not merely alternatives to animal use, they are the next generation of tools designed to advance medical progress. **AV**

Jill Howard Church, M.A., is Managing Editor of AV Magazine.

Dissection and Anatomy Apps

A variety of inexpensive apps for smartphones and tablets can provide valuable lessons in anatomy and physiology without the use of animal specimens. Here are a few:

HIGH SCHOOL ANATOMY, BY POCKET ANATOMY (www.pocketanatomy.com), offers full-body male and female human lessons aligned with middle and high school science standards, as well as a teacher's guide and quiz options. It examines respiratory, digestive, circulatory, reproductive, urinary, lymphatic, skin, skeletal, and nervous systems. Separate related apps focus on the heart and the brain.

3D CAT ANATOMY, BY BIOSPHERA (www.biosphera.org), is part of a series of veterinary apps that also includes modules for dogs, rats, birds, cows, and horses (and soon pigs). Designed for students, teachers, and veterinary clinics, they show internal anatomy and body systems, alone or in combinations, including multiple angles and zoom levels.

BIODIGITAL HUMAN, BY BIODIGITAL SYSTEMS, INC. (www.biodigital.com/education), models more than 5,000 anatomical objects and health conditions with interactive visualizations in 3D. Developed in part by the New York University School of Medicine, these "virtual cadavers" allow students and teachers to dissect, explore, and search within the human body interactively.

TOUCH SURGERY, BY KINOSIS (www.touchsurgery.com), is a surgical simulator app developed in England in conjunction with leading medical schools. Its 3D simulations and content are designed for medical students and professionals to learn and practice more than 50 surgical procedures.

PERSPECTIVES

Science educators are key leaders in the effort to move away from animal-based dissection and toward the use of more sophisticated teaching methods. We asked several at the high school and college level to share their experiences and insight.

JULIANA TEXLEY
The Next Generation

MANY YEARS AGO I wrote a professional article about an activity that I used in my classroom. It was the time of science fairs, and students were constantly suggesting projects that used animals. Before they were allowed to even suggest an idea, we all did the activity I called "Alive and Satisfied." They had to study how a vertebrate or invertebrate might be maintained in a situation closest to its natural habitat, with no constraints.

Once students realized that they couldn't do experiments *on* animals, their choices actually expanded. They had to ask questions and define problems, plan and carry out an investigation, and analyze and interpret data in an observational way.

The best experiences were when students took a step back and looked at the animals they loved best, their pets. "What percent of my cat's time is spent sleeping when he's alone?" led to a deeper understanding of energy. "Why does my dog respond aggressively to other dogs if she is walking ahead of me, but not when she heels?" led to understanding of animal packs. "What are examples of competition at the bird feeder?" led to competition strategies.

Unlike traditional "dead" life science labs, these have potential for cross-cutting concepts as part of a national standards process called the Next Generation Science Standards (NGSS). NGSS provides a concrete model for three-dimensional learning for science education; students learn not only a progressive set of disciplinary core ideas, but connect these ideas and explore how to discover and refine them through science and engineering.

So when ethology (the study of animal behavior) was added to the traditional life science content, the recommendation carried considerable weight. But the challenge was still significant. For a century, the most common hands-on experiences in the study of vertebrates in middle school involved dead animals. Very few textbooks explore behavior; even fewer suggest activities that would incorporate the practices of science in such lessons. But today there are many opportunities to bring in these new ideas and link them to others. In the end, students realized their responsibilities.

Juliana Texley, Ph.D., was the 2014-15 President of the National Science Teachers Association, and is currently a science instructor at Lesley University, Palm Beach Community College, and Central Michigan University.

REGINA MILANO
Conveying the Truth

MANY RESPECT DISSECTION as an ancient practice. But in the age of technology, where information is abundant, why has dissection persisted? Have we forgotten to question where "things" (or in this case, "beings") come from?

Dissection calls for the mass production or procurement of animals for the sole purpose of killing them, in ways far from euthanasia. We've gotten so far from the farm that we don't know where our food or clothing come from; so far from the forests and oceans that we don't know where entertainment comes from. But if we spare ourselves witnessing what animals endure to become dissection specimens, how will we convey "truth" to our students? Truth is, teens face enough social, emotional, and physical stress to cope with knowing that they've just sliced into an animal who looks very much like the star of their favorite children's story, or the stuffed toy that comforted them as children when the world was cold or friends were absent.

In the years in which I taught alternative education students, I spoke to many students and listened even more. I found that the hardened ones, who had to grow up too fast, didn't want to

PHOTOS COURTESY OF THE AUTHORS

dissect. They empathized with the victimization of the animals because they too were victimized. Students who wanted to dissect researched where the animals came from and reflected on the animals' perspectives. They were aghast at what they learned. They formed an animal rights group called Humane Club because they wanted to stop dissection. And to some extent, they did: They became lobbyists and helped pass Connecticut's dissection choice law in 2013.

Perhaps this story about animals wasn't a sweet one, like the stories read in childhood, but once again, animals taught young people the importance of doing right by others by being brave and saying "no."

Regina Milano, Ph.D., is a science teacher and the moderator of the West Haven (CT) High School Humane Club.

BRIAN OGLE

The Need for a Shift

MOST OF US HAVE a vivid memory of participating in a dissection exercise during our academic careers. Dissection stories and lore have been passed down by each generation of students and serve as a common bonding experience. Yet most of these memories are not centered on what was learned or the skills that the instructor hoped you learned; most memories are negative or unrelated to the learning objectives for the activity.

At the start of each semester, one of the first questions I am asked is if there will be any dissections in the course. My response highlighting the absence of dissections in the class usually brings a collective sigh of relief in my students. In six semesters of dissection abstinence, I have not had a single student complain because there were no dissections in the course. I think this speaks volumes about the modern perspective of animals our younger generation exhibits and the need for a shift in our instructional practices from kindergarten through college.

A review of recently published research regarding dissection demonstrates that findings are often varied and may exhibit bias for one particular viewpoint. Because of this, some argue it is difficult to find empirical evidence that supports the decision to move away from dissections in the classroom. While there is merit to the notion that learning must be physically tangible and simulations cannot replace this form of learning, the loss of life for hands-on learning experiences is incompatible with a modern society that places a high value on the fair treatment of animals.

The use of dissection as a teaching tool is quickly becoming outdated and unnecessary in today's world. With so many replacement options available to teachers of all grade levels, it is inappropriate in most circumstances to continue with dissections.

Brian Ogle, M.S., teaches anthrozoology and animal behavior, and is an instructor at Beacon College in Leesburg, Florida.

BONNIE BERENGER

To Dissect or Not to Dissect?

MY DISSECTION JOURNEY BEGAN more than 20 years ago.

To effectively teach anatomical concepts, dissection was the best approach. Or so we thought. I was never offered an alternative, either as a student or as a teacher.

As a student, and later as a teacher, I gradually noticed more and more students objecting to dissection. They were ethically opposed to cutting open an animal for the sake of learning about body systems. I also wrestled ethically with the practice. There was something about taking a fetal pig out of a five-gallon bucket of formalin that did not appeal to me or most of my students. I was tired of not feeling good about a lesson on anatomy that always involved opening windows to help dissipate the smell of preservatives that conceal death, instead of welcoming an honest conversation about what constitutes the beauty of a healthy, anatomical being.

Our roles as educators are multifaceted. We are not simply disseminators of information. We are nurturers, role models, facilitators, entertainers, and cheerleaders. How can we, as educators, teach compassion through mutilation? How can we teach acceptance through violation? I decided to make a difference, a change.

After getting approval from my school supervisor, I reached out to the insightful professionals at Animalearn, who helped me select the appropriate software and physical models to borrow. I could not have embarked on this journey without their wonderful support! I created a challenging dissection alternative course that utilized virtual dissections and physical models. Surprisingly, students in the non-dissection courses scored higher than their dissecting counterparts.

Although we often act like the spider, humans are only one strand in the web of life. We are connected to everything else in the ecosystem. This important concept should be weaved through our lessons as educators. Non-dissecting is a perfect place to start. AV

Bonnie Berenger, who teaches science at Hunterdon Central Regional High School in Flemington, New Jersey, was named Animalearn's 2015 Humane Educator of the Year.

Veterinary Medical Education

By Crystal Schaeffer

Companion animals are beloved members of our family, and we trust veterinarians to protect and care for them. In fact, how we view the family vet shapes how we perceive the veterinary profession. But veterinary medical education can be problematic. In traditional learning, vet students are sometimes required to participate in exercises that can cause animals pain and distress. However, over the past 20 years there has been a growing, more humane approach to veterinary medical education that is benefiting students and animals.

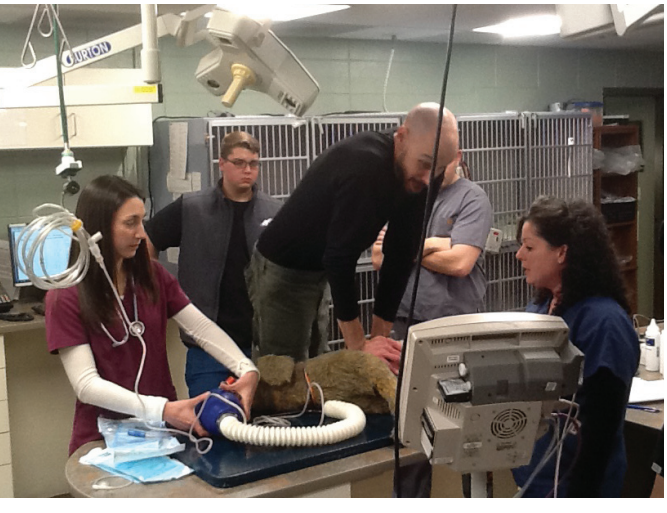
DOG LABS

Practicing procedures on live dogs was the norm for decades in vet schools until the sources of animals used, as well as terminal surgical dog labs, became controversial in the 1980s.

In 1987, with the support of AAVS and other animal groups, two students filed a lawsuit against the University of Pennsylvania School of Veterinary Medicine after being threatened with expulsion because they refused to participate in terminal surgical labs. In these required courses, students performed spays or other types of abdominal surgeries on beagles who were then given a week to recover, only to be used again in other painful procedures before being killed.

One of the students commented, "We question the source of the animals and their fate. We are creating disease in healthy animals. Then we kill them, just because they were bought for that purpose."[1] Some students wanted to adopt the dogs when the course was over, but "were told that all the dogs had to go under the terminal procedure."[2]

The University of Pennsylvania eliminated terminal surgeries in its small animal curriculum in 2002,[3] two years after the Tufts University Cummings School of Veterinary Medicine became the first U.S. vet school to do so.[4]



Staff at the Fort Collins Veterinary Emergency and Rehabilitation Hospital in Colorado have been using manikins instead of live animals for education and training.

PHOTO COURTESY OF FCVERH

Even earlier, in 1998, the Western University of Health and Sciences College of Veterinary Medicine (CVM) was established with an innovative curriculum that does not include the harmful use of animals. Instead, students use models, computer simulations, and high-tech manikins, as well as apprenticeships, and "never perform unnecessary surgeries or procedures on healthy animals."[5] CVM also has a program in which guardians can donate their deceased companion animals for use in anatomy and clinical skills exercises. Philip Pumerantz, Ph.D., former President of the university, said, "Our objective is not just to open another college of veterinary medicine, but to create a new paradigm in veterinary education."[6]

FOCUS ON ALTERNATIVES

One impetus for change was a legal action taken by the Association of Veterinarians for Animal Rights (AVAR). In a survey, AVAR found that during the 1998-1999 school year, 22 participating veterinary schools used nearly 36,500 animals in various procedures in which more than 9,300 healthy animals were killed as part of the protocols.[7] The survey also found that 15 vet schools required participation in terminal surgery labs in core and/or elective courses.[8]

Armed with survey results, procedure protocols, and testimony from veterinary students who requested but were refused alternatives, AVAR filed a legal petition with the U.S. Department of Agriculture (USDA) in 2002. It asked the USDA to enforce the Animal Welfare Act (AWA), which requires consideration of alternatives to painful and/or duplicative procedures. AVAR wanted the USDA to investigate and cite veterinary schools that failed to do so, and to clarify that the definition of a painful procedure includes instances in which analgesic and anesthesia are used and, therefore, alternatives must be considered.

The latter is an important distinction, because it was discovered that "some investigators are bypassing the review of alternatives requirement by stating that the animal does not feel pain or distress because pain-relieving drugs are administered prior to the procedure or the animal is killed either at the beginning or the end of the procedure."[9] The petition reported that this type of violation was "widespread throughout the veterinary schools,"[10]

and in research facilities as well.[11]

In response, the USDA acknowledged that vet schools had violated the AWA and agreed to investigate every veterinary school in the country to review teaching protocols that involved pain and/or distress. As a result, almost every vet school was cited for violations, particularly for failing to consider alternatives to painful procedures.

The USDA reached out to the Association of American Veterinary Medical Colleges to help assure compliance with the law. AAVS's affiliate, the Alternatives Research & Development Foundation (ARDF), co-sponsored a 2006 symposium for vet school administrators and faculty, "The Use of Animals in Veterinary Medical Teaching—Replacement, Reduction, and Refinement."

As part of this event, ARDF presented the William and Eleanor Cave Award to Dan Smeak, D.V.M, then a surgery professor at The Ohio State University's College of Veterinary Medicine, for his achievements in developing alternatives. A vet student in the 1970s, Smeak recalled, "I was not prepared for the live animal experience in surgery. In fact, I hated my early surgical courses."[12] He developed alternative surgical models and established a shelter medicine program, allowing veterinary students to benefit animals in need while receiving clinical and surgical training.

STUDENTS TURN TO ANIMALEARN

In 2008, AAVS affiliate Animalearn was contacted by a student at the University of Georgia (UGA) College of Veterinary Medicine who was seeking help to replace terminal dog labs with humane alternatives. Animalearn provided alternative materials from The Science Bank, plus guidance on how professors could incorporate them into their curriculum. Animalearn also gave a grant to help UGA establish a shelter medicine program, which included spay/neuter recovery surgical labs, and to develop a surgical tutorial DVD. UGA began an Education Memorial Program to obtain ethically sourced companion animal cadavers at the vet school. With support from faculty and the administration, and guidance from Animalearn and other groups, students were able to end terminal dog labs at UGA in fall 2008.

Animalearn also worked with students at the College of Veterinary Medicine (CVM) at Michigan State University (MSU) to end its terminal surgical labs. Animalearn was contacted by the student animal rights group at MSU following the 2009 release of "Dying to Learn," a report that revealed the extent of MSU's harmful use of dogs in teaching labs, as well as the source of the animals.[13]

ACQUIRING ANIMALS

Even within the past decade, vet schools were still acquiring animals from questionable sources, including USDA-licensed random source Class B dealers. Several dealers were notorious for violating the Animal Welfare Act for issues including poor record keeping, failing to provide proper veterinary care, and illegally obtaining animals. Animalearn's 2009 report, "Dying to Learn," found that some schools procured animals through pound seizure (the acquisition of dogs and cats from shelters for use in research and education), either directly from the shelters or via random source Class B dealers. Fortunately, these arrangements are not as common today, due in part to the drastic decline in the number of such dealers.

In March 2010, a few months after Animalearn staff presented their findings and recommendations to veterinary students and CVM administrators, MSU announced it would no longer offer terminal labs.

MOVING FORWARD

Over the past 20 years there have been significant changes in veterinary medical education, owing much to the actions of ethically motivated students and educators who challenged the status quo. Today, veterinary students can use alternatives for training, including virtual dissections and lifelike manikins. Shelter medicine programs and ethically sourced cadavers are also important.

New technology offers other opportunities to develop important skills. ARDF has awarded grants to educators to develop virtual anatomy programs, surgical training models, high-definition videos, and clinical skills simulators. Recently, the SynDaver company created an incredibly lifelike dog model that can be used to practice surgery and other procedures.

While the veterinary field embraces more modern, humane approaches to education and training, obstacles remain. However, if recent developments are any indication, in the near future we can look forward to a time when all students can become veterinarians without harming animals. **AV**

Crystal Schaeffer, M.A. Ed., M.A. IPCR, is the Outreach Director for AAVS.

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INTERVIEW

Richard Hill

Co-Founder, Froguts

David Hughes and Richard Hill on Capitol Hill.

Former science teacher **Richard Hill** and software architect **David Hughes** developed the award-winning Froguts virtual dissection and science adventure software modules and labs for grades K-12. We recently spoke with Richard about the company's growth and popularity.

AAVS: How did Froguts come into existence?

RICHARD: Froguts came into existence when I started dabbling in the concept of a simulation to replace an unsuccessful frog dissection that my daughter did in elementary school. What I wanted to do differently [from other simulations] was to make it as realistic as possible so that you might actually retain the knowledge of the miraculous creature you were investigating. I fiddled with the concept for a bit until I happened to be working on my master's degree in Instructional Technology, where the opportunity came along to build it out completely as a graduate project in 2001. When I put it up on the web for free, it really took off, but by the end of the first year I was told that I needed to pull my site down or pay an insane amount of [hosting] money that I really couldn't afford as a science teacher. My old friend David Hughes helped broker a deal to keep Froguts.com alive. By the end of 2002, the Froguts subscription service came into existence.

How has Froguts evolved?

Eventually we were able to get everything up as a true web service. In 2009 we were invited to Congress twice and labeled as part of the "Future of Technology" in America. Then we made some Apple, Kindle, and Android apps. But it has always been a struggle to keep it sustainable, and we are trying to figure out where to go next. Stay tuned.

What role does Froguts play in keeping students engaged both scientifically and ethically?

Froguts' original intent was to help my daughter and others like her to repeatedly learn with interest rather than be repulsed. We as humans learn about function, causality, social interaction, and even empathy from playing with our toy cars, dolls, and anthropomorphic toys. Virtual simulations are driven from our playful and curious nature to learn, but keep us in an ethically safe experiential zone. Froguts is one of those few instructional systems that actually has engaged both scientifically and ethically fairly well, and I'm pretty proud of that. The balance to all this has always been to make it as real as possible while focusing on the learner experience.

Have you seen a change in the science teaching community's reception to virtual programs such as Froguts?

Yes! In the early days at our first National Association of Biology Teachers trade show, we had a biology teacher so angry at the paradigm shift we were presenting that he tried to poke our laptop off the podium while screaming at us. One of the main items on the agenda that year was to decide the efficacy of virtual dissections, which was hotly contested by the old-school biology teachers. Fast-forward a decade later, and we were the Platinum Sponsor of the event. Interestingly, with crowded classrooms, teacher shortages, and new technologies like ours, opinions have changed. We get way more praise from teachers now, and no one has gotten angry at us in years. **AV**

Learn more at Froguts.com.

PHOTOS COURTESY OF FROGUTS (THIS PAGE) AND JEN KATZ (OPPOSITE)

NOTES+ QUOTES

Animalearn often receives wonderful feedback from parents, students, and teachers who use The Science Bank's resources. We very much appreciate those who take the time to let us know how this program is working for them. It's gratifying to see humane progress in so many communities.

Thank you so much for letting us use your materials, we very much enjoyed them. Your materials let us learn about many things, without hurting live creatures.

BUTLER MONTESSORI UPPER ELEMENTARY STUDENTS

Thank you for shedding light onto the bioethical aspects of dissection. We used the cat model in our Anatomy and Physiology lab, and it was a very helpful learning resource indeed.

GEORGE ILODI, PH.D.
Teacher

I just wanted to let you know how incredibly COOL the cat [model] is!!! We are also really loving the "Anatomy and Physiology Revealed: Cat" website and are using it to identify the cat's parts. It's truly amazing you've made this resource available and I really want to THANK YOU!!

MARK KNAPP
Teacher

Olivia Katz is among the students who have worked with Animalearn to get humane materials for their classrooms.

Thank you so much for generously lending these materials! My daughter learned the important lesson that there is always a way to stand up for what you believe is right while still fulfilling academic requirements.

JEANNINE ANDERSON
Parent

Thank you so much for these resources! They were a great stand-in for the dissection lab, and my classmate told me that studying with them was even more helpful than doing the lab itself (showing even more the lack of need to do the animal dissection lab!)

HELEN KINSEL *Student*

I received the fetal pig model and software. I just don't understand why anatomy classes still dissect creatures. Thank you for the work you do! You are making a positive difference in the universe.

STACIE MEYERS *Student*

There were five girls who opted for the alternative today. I am hoping that next time the kids won't be asked if they want to dissect in front of their peers, because I think more kids will opt out. This is a great start and we couldn't have done it without the Animalearn team.

JEN KATZ *Parent*

I wanted to send my heartfelt thanks for letting me use your "Anatomy and Physiology Revealed: Pig" program. It made it possible for me to do an alternative to the upsetting fetal pig dissection. It is such a high-tech and complete program and I truly appreciated it!

CAITLIN MOORE *Student*

Giving

SUPPORT THE AAVS MISSION

Support Kind Kids

There is a demented sense of irony in forcing children and young adults to dissect *dead* animals in order to pass a course in biology, the study of *life*.

All school students, from kindergarten through college, should have a choice when it comes to dissection. Using animals in education exercises is an unnecessary demonstration of what is already known. Alternative teaching tools are equally effective, and frequently superior.

Thanks to your support, Animalearn spearheads the movement toward humane science education, and fosters the use of alternatives as a better way to teach and learn—not just for the benefit of animals, but for everyone.

We have an exciting opportunity to educate students using contemporary technology with which they are already familiar and appreciate, rather than formaldehyde-drenched specimens. Be a part of this progressive movement to educate the next generation of students through understanding and compassion, and relegate dissection as a practice of the past.

Please help AAVS promote and expand The Science Bank by designating a special gift for Humane Science Education using the enclosed envelope. You may also donate securely online at www.aavs.org/SupportAnimalearn.

For information on planned giving, leadership gifts, recurring gifts, or other support, contact Chris Derer, Director of Development & Member Services, at 800-SAY-AAVS or cderer@aavs.org. When including AAVS in your estate plans or sending a donation, please use our legal title and office address: American Anti-Vivisection Society, 801 Old York Road, Suite 204, Jenkintown, PA 19046-1611. EIN: 23-0341990. AAVS is a not-for-profit 501(c)(3) organization to which contributions are 100 percent tax-deductible under federal and state law.

TRIBUTES

HONORING LOVED ONES

In memory of Pixel, a feisty, friendly dog that we miss very much.
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Chevy Chase, MD

In memory of Patrick, a dog who changed my life.
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Susan Allen
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In memory of Dusty, Zeus, Lucky, and Trouble. Until I cross the rainbow bridge and can be with you.
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Sharon Wisniewski
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In loving memory of our beloved friend, Peanut. You gave us 12 loyal years of companionship and countless wonderful memories. Words cannot express how much you did and continue to mean to us.
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In memory of Dorothy Marion. She loved animals and AAVS with extraordinary passion.
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In honor of Robin, our beloved little hamster who recently passed away. We will always love you, Robin!
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In memory of Touffles and Bailey.
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PHOTO BY ISTOCK PHOTO

In memory of my father, Louis Schurman.
Robert Schurman
Paramus, NY

In memory of Barbara Schurman. God bless you, Mom. It's been nine years since you passed away–May 12, 2007, Mother's Day. You loved all animals.
Robert Schurman
Paramus, NY

In honor of Per Flood.
Clarice Prange
Forest Park, IL

In honor of Judy Hart, the BEST mom in the world! I am lucky to have you as my mom and friend and Macy's grandma! And I am fortunate to have inherited your love of animals! Thanks for never saying "no" when I would bring home a new pet! I love you so much!
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William Coultaus
Franklin Square, NY

In honor of my animals, passed and present.
Dorothea Aust
Astoria, NY

In memory of Amber and Gus, miss you always.
Barbara Roth
Annandale, VA

In memory of Smokey, Trouble, and Tippy.
Larry Schnieders
St. Louis, MO

In memory of our mothers, Marianne Logiodice Cardillo and Catherine Murray Leary. Thank you for your love.
Rob Cardillo and Sue Leary
Ambler, PA

In memory of my cats, Roxanne, Sammy, and Teddy.
Robert and Margaret Fraser
Dedham, MA

In honor of Sandra Shively, a truly compassionate animal champion.
Ellen Shively
San Diego, CA

In memory of Patty, a former laboratory test beagle. Patty, you were the best friend and companion imaginable.
James Wolfe
Wilton Manors, FL

In memory of my many beloved pets.
Ellianne Odom
Samsonville, NY

In memory of Carl and Willie.
Dick Olsen
Albany, OR

In honor of Sue Leary.
Regina Canuso
DeWitt, NY

In memory of Windigo, a white German Shepherd. You were a very loyal friend and made my life safer and happier.
Robert Holly
Willernie, MN

In memory of Bizarro II.
Susan Munzer
Melrose Park, PA

In memory of Mike Madsen. You will forever be my true love.
Penny Madsen
Mankato, MN

In memory of Lucky LuLu Belle.
James Spates
Austin, TX

You can honor or memorialize a companion animal or animal lover by making a donation in his or her name. Gifts of any amount are greatly appreciated. A tribute accompanied by a gift of $50 or more will be published in *AV Magazine.* At your request, we will also notify the family of the individual you have remembered. All donations are used to continue AAVS's mission of ending the use of animals in biomedical research, product testing, and education.

Members' Corner

I DON'T KNOW ABOUT YOU, but I'm tired of superhero movies. Instead of paying big bucks to watch Batman or Spider-Man at the local multiplex, I'd rather learn about the lives of actual bats and spiders on documentary programs such as *Nature*. Unlike us mere humans, varied animal species are naturally endowed with superpowers: heightened hearing, night vision, remarkable reflexes, extreme speed, great strength, underwater breathing, shape-shifting, flight. It's no wonder that we create fantastic fictional characters whose abilities often mimic those of animals.

I'm always eager to learn more about all creatures—mammals, birds, fish, reptiles, amphibians, and arthropods—but I'm especially fascinated by beavers. For 20 million years, these clever and industrious vegetarian rodents have earned their reputation as nature's greatest engineers.

Who needs fictional superheroes when beavers and other wildlife have super skills that amaze us?

At one point, beavers were nearly hunted to extinction for fur and medicinal uses, but they have since recovered. The beaver's incredible dam-building efforts make it a keystone species to maintaining aquatic ecosystems for the benefit of many species, including humans. I'm not usually a fan of animal-related idioms, but I can think of no finer compliment than "busy as a beaver."

Although I could watch animal documentaries all day, television should not be our only tool for learning. The view out a window or a stroll through the park offer wonderful experiences in nature gazing: birds building nests, squirrels hiding food, turtles sunning themselves on logs, geese grazing as one keeps watch. We can learn a great deal from animals about social bonds, respect for elders, collaboration, patience, sharing, compassion, determination, and coexisting peacefully.

Just as wild animals have much to teach us, companion animals also help us learn about responsibility, loyalty, empathy, and unconditional love—qualities that are essential to people of all ages, but especially children. It's been well documented that companion animals can improve our mental and physical health, reduce stress, improve mood, and even prevent the development of some allergies. Additionally, the presence of animals has proven both beneficial and therapeutic for children with autism and learning disabilities. Animals have been shown to put children at ease, help them to bond, build confidence, and even assist with improving literacy.

Given the wealth of educational opportunities found in nature, and the joy of learning about the fascinating world around us, it is unfortunate that science classes still rely on archaic (and frankly disgusting) dissection labs utilizing dead animals. My colleagues at Animalearn are to be commended for showing students that biology does not have to be about death, but rather about the diversity of life on our living, breathing planet.

For the animals,

Chris Derer
Director of Development & Member Services

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