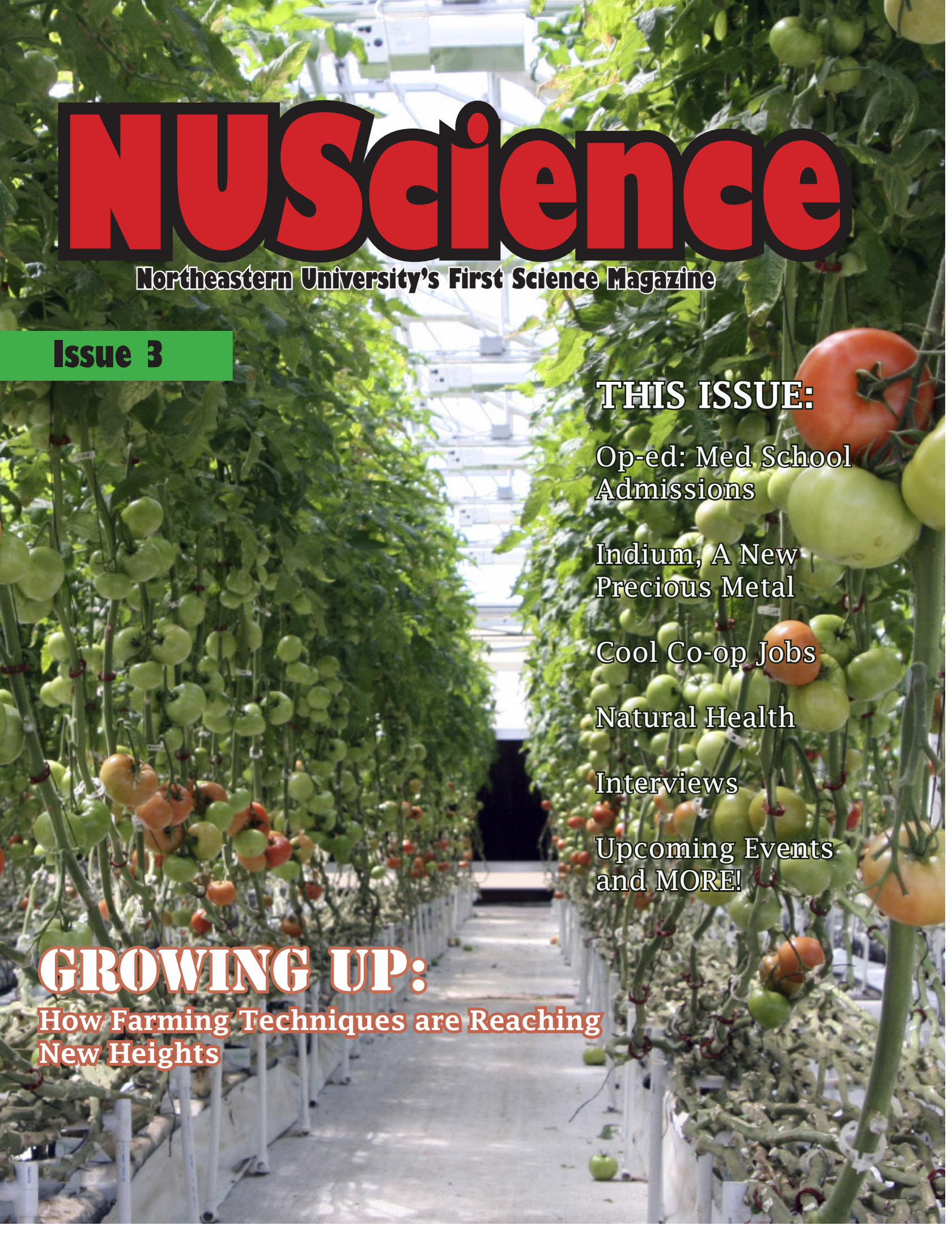

NUScience

Northeastern University's First Science Magazine

Issue 3

THIS ISSUE:

Op-ed: Med School Admissions

Indium, A New Precious Metal

Cool Co-op Jobs

Natural Health

Interviews

Upcoming Events and MORE!

GROWING UP:

How Farming Techniques are Reaching New Heights

Letter from the Editor:

Dear Reader,

As the 2009—2010 academic year winds down, we are reminded of all we have accomplished in our classes, on co-op, and in our activities on-campus and in the Boston community. At NU Science Magazine this reflection period is no different.

Starting a magazine from the ground up has been an exhausting and challenging process, but one that has been continually rewarding and engaging. Through countless hours of meetings and hundreds of emails, the executive board and general council members have been working tirelessly to improve our product and to make it a lasting legacy on campus. I can't thank them enough for their ceaseless dedication and passion for this magazine.

You hold in your hands our third and final issue for the year. With new features, more research articles than ever before, and more innovative additions to longer pieces, this is truly the product of a collaborative, engaging process. We hope you enjoy, and as always, we welcome your feedback.

Have a great summer and we look for us on campus in September!

Kristina Deak
President

NOTE: All sources for articles are on backlog. If you're interested in further reading, please contact us!

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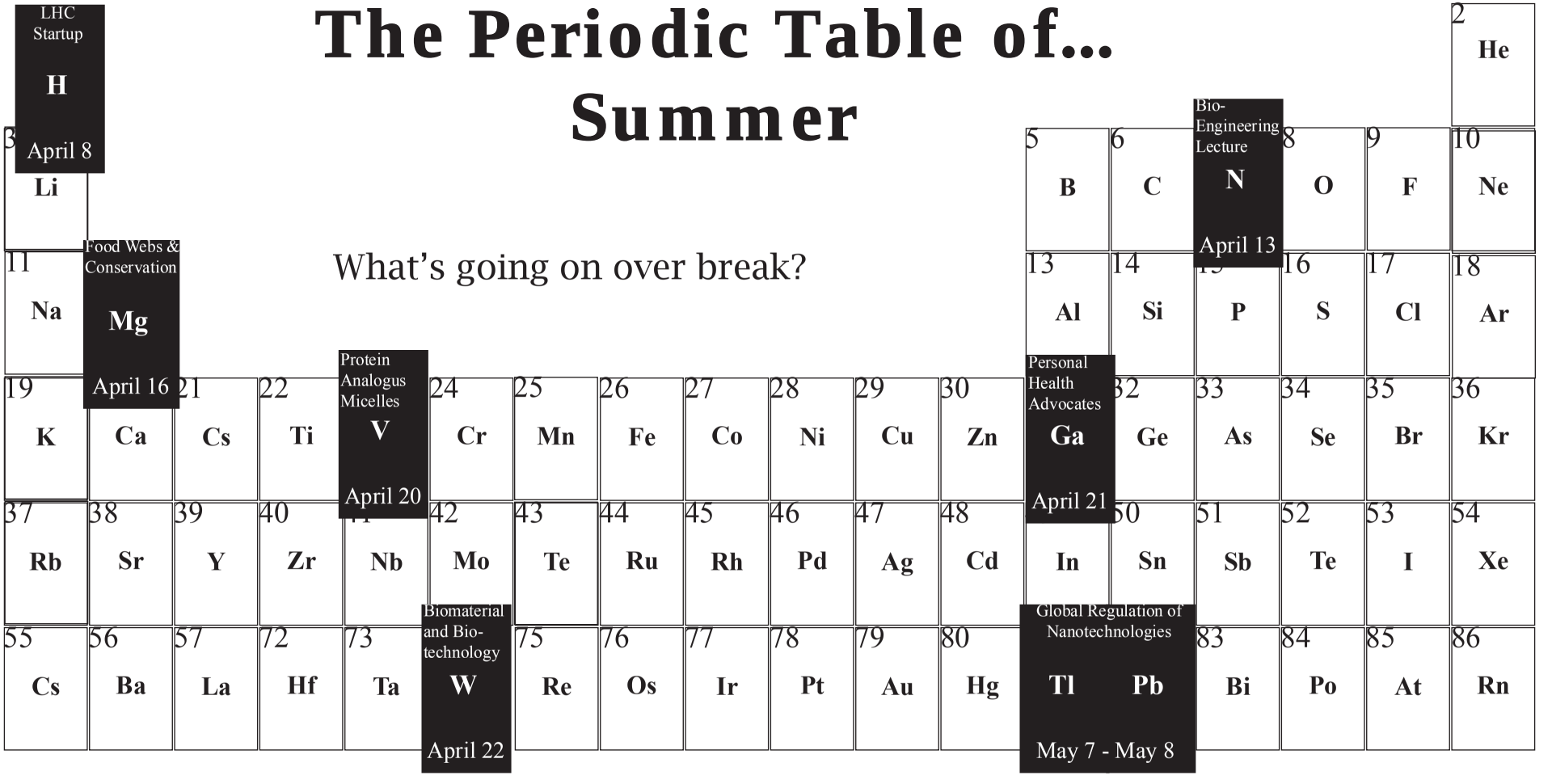
We would like to extend a special thanks to all those who have contributed to the magazine this year:

Lincey Alexida, Shannon Barrow, Samir Berry, Andrea Dedenato, Kristina Deak, Kyle Deerwester, Tara Dhingra, Taylor Elam, Andrew Grube, Sadie Lang, Sara McKechnie, Anthony Moffa, Michelle O'Connor, Sonal Patel, James Peerless, Sanel Selimovic, Nicole Smith, Emily Snead, Brad West, Rebecca Wille

The Periodic Table of... Summer

What's going on over break?



April 8 – "Large Hadron Collider Startup: The Exotic Journey Begins"
Physics Colloquium
5 pm, 114 Dana Research Center

April 13 – "Engineering Approaches for Functional Nerve Regeneration"
Chemical Engineering Seminar
11:45 – 1:25 pm, 220 Shillman Hall

April 16 – "Food Webs and Conservation: Misleading Cartoons of Reality or Useful Guides to a Complex and Interactive Nature?"
Marine Science Center - 4:30-5:30 pm, 430 Nahant Road

April 20 – "Protein Analogous Micelles: Versatile, Modular Nanoparticles"
COE Dean's Centennial Lecture Series
11 – 12 pm, Alumni Center

April 21 – "Personal Health Advocates"
Insights – Timothy Bickmore
6 – 8 pm, Alumni Center

April 22 – "Biomaterials and Biotechnology"
COE Dean's Centennial Lecture Series
3 – 4 pm, 135 Shillman

May 7 – May 8 – "Global Regulation of Nanotechnologies Conference"
Northeastern University School of Law

Only Dopes Use Dope

Professor Mark Weiser of Tel Aviv Univeristy recently determined that young smokers have lower IQ's than nonsmokers. By studying 20,000 male soldiers between the ages of 18 and 21 enlisted in the Israeli army, Dr. Weiser was able to quantitatively investigate a trend that had been cautiously assumed in the healthcare community for some time.

The results were rather alarming. The average IQ for a non-smoking male in the study was 101. The smoking peer typically had an IQ of 94, and those who smoked a pack or more a day boasted an IQ of only 90. To be fair, a typical cross-section of the IQ scores for average young men ranges from 84 to 116. However, one of the most disturbing elements of the study revolves about the prospect of twin studies. Among those examined, it was found that in identical twin pairings the nonsmoking brother almost always had a higher IQ.

This study has broad applications in the realm of public outreach, as it better focuses the resources of the government as they continue their anti-drug educational campaign. As those people of lesser intelligence appear to be more susceptible to cigarette use, they may be targeted for with additional education and therapy to help them to avoid the development of such a dangerous habit.

-Kristina Deak

Slug Update:

How one slug is going green by becoming a living solar cell.

Imagine if we could adopt the characteristics of the food we eat. Eat some fish, and suddenly you can breathe underwater. Pop in some kangaroo jerky, and presto, no need for a purse. Have some carrots, and your fear of being buried alive has suddenly vanished. As it turns out one spectacular species of slug has evolved to do just this with green algae.

Elysia chlorotica is a, oddly enough, green leaf-shaped sea slug that has been observed going almost it's full adult life (about one year) without its primary food source. Scientists discovered that this environmentally friendly creature has been using the green algae to perform photosynthesis for periods time after consumption. Researchers originally believed the slug had allowed a portion of the algae to live inside the slug and grow from light shining through the translucent slug's body. The actual mechanism, recently discovered, is astonishing.

As it turns out, the slug actually absorbs the algae's chloroplasts and performs photosynthesis long after the algae has been digested. Of course, more is needed to perform photosynthesis than merely chloroplasts. To overcome this obstacle the slugs have been absorbing the algae's genes as well as its chloroplasts. Only the genetic information for 10% of the proteins needed for photosynthesis is found in the chloroplasts themselves. The information for the rest of these necessary building blocks are found in the nucleus of the algae.

Although this sounds simple, it is truly groundbreaking from a biological standpoint. The ability of an animal to incorporate the genes of another species, and a plant at that, into its genetic code shows another unprecedented ability of natural evolution. As with many other micro-biological anomalies, the mechanism by which the slug absorbs and incorporates this genetic material still remains a mystery. Unlike the chloroplasts that can just pack their bags and just move on out, the other genetic material is housed deep within the algae's cellular nucleus, the most inaccessible part of the cell.

The process of incorporating nuclear DNA involves more than just a smash-and-grab job. Not only does the slug have to harness the genetic material, it has to somehow incorporate the genes into its one genetic code. Scientists continue to explore the phenomenon as the process could have implications in genetic engineering and possibly cancer research. It turns out our slimy best friend could revolutionize applied genetics with some very real results.

-James Peerless

In Memory of Dr. Bill Giessen,

May he rest in peace

Northeastern University mourns the loss of Dr. Bill Giessen, who passed away March 25th due to a long-term illness. An ambitious and active mind in the scientific community, Dr. Giessen joined the NU community as an Associate Professor of Chemistry in 1968. Five years later he attained the position of Professor of Chemistry and Mechanical Engineering, and the Associate Director of Chemical Analysis and Material Science. Throughout his successful career in Boston he published 225 papers and held an impressive 15 patents on alloys and materials. Furthermore, he has been honored both as an Outstanding Educator of America and in the American Men and Women of Science. As a generous and committed patron of the university, Dr. Giessen founded the Gustel and Ernst Giessen Memorial Award in Advanced Research, a scholarship awarded annually by the Barnett Institute.

In addition to these illustrious accolades, Professor Giessen was involved in efforts to reestablish ties between German and Jewish communities. This stems back to his childhood experiences of living in Nazi Germany. He established both the Robert Solomon Morton Lecture Series and the Gustel C. Giessen Memmorial Lecture in Jewish Studies. Finally, he created another scholarship fund, which allows a student from Northeastern, Hebrew College, or NEC to examine the artwork of those tortured by the Nazis.

Said President Aoun in a recent university release, "For more than 40 years, Bill Giessen's intellectual curiosity and extraordinary commitment to the community enriched Northeastern and indeed the world. His legacy of scholarship, moral clarity, and generosity of spirit will always inspire those who knew him and influence generations to come."
The staff of NU Science Magazine would like to recognize this noble and influential member of the faculty and thank him for the long-reaching effect his intellect and talent have had at Northeastern University. Dr. Giessen, you will be greatly missed.

- NuScience Staff

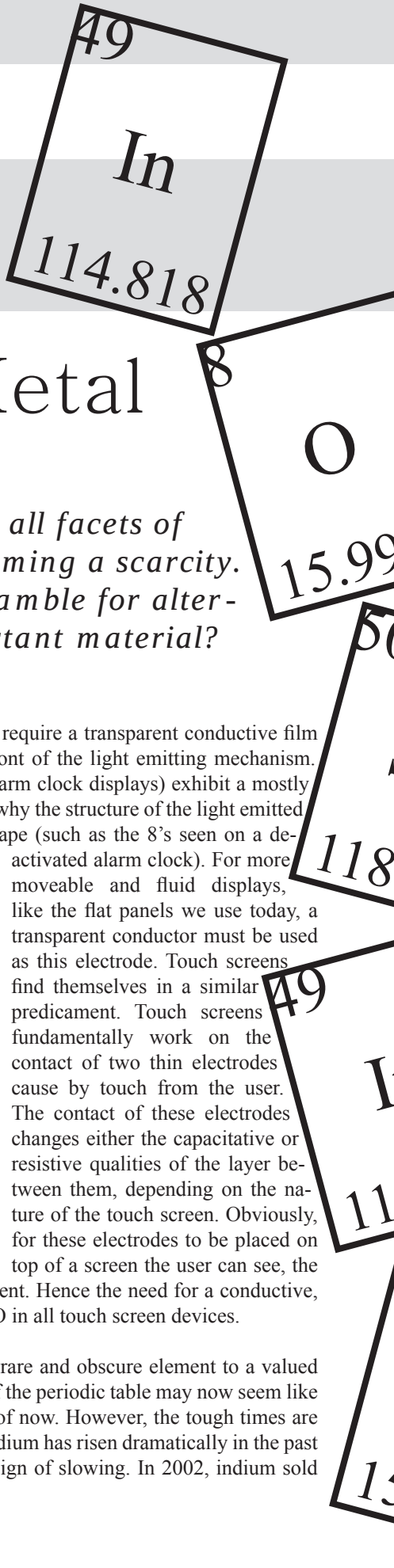
$elling the $huttles

Three NASA Space shuttles are now up for sale. Discovery, Endeavour, and Atlantis are being retired and sold, ideally to a school or museum. The shuttles are scheduled to go on sale after the construction of the international space station nears completion in 2011. The asking price was originally 42 million dollars per craft. However, as of February 12th, the price has since been dropped to just over 28 million US dollars. This price cut is a result of high transportation costs from the Kennedy Space Center, and NASA has factored in the cost of the new owner displaying the shuttles in climate-controlled environments. The engines were originally between $400,000 and $800,000 each; however they are now free aside from the cost of shipping and handling. This drastic markdown was due to the lack of expressed interest. The Smithsonian Institute reportedly does not have interest in purchasing a shuttle, claiming a lack of room. The National Air and Space Museum has claim to Discovery, but, Endeavour and Atlantis are still being bid on by 19 museums from across the country. Up to this point, there have been no private bidders interested. Sadly, there will not be a billionaire jetting off into space this time.

- Kaitlyn Sanders

Indium:

The New Precious Metal



As touch screens, LCD's and Plasma displays invade all facets of our lives, one of their prime components is fast becoming a scarcity. As consumers clutch their iPhones and scientists scramble for alternatives, what will the future bring for this all-important material?

Indium has usually been an afterthought of an element. It is unheard of in high school chemistry and all but forgotten within the bowels of the periodic table. Discovered in 1863 in Germany, the metal was dubbed indium due to its strong indigo line in the UV spectrum. Its first emergence was as an additive in gold tooth fillings in the early 20th century and later began to be used more commonly in the nuclear industry. On earth, it is the 61st most abundant element, found in about 0.25 parts per million, or about three times as abundant as silver or mercury. Although we don't expect to see indium on jewelry any time soon, the concern with indium's rarity is found in its utility.

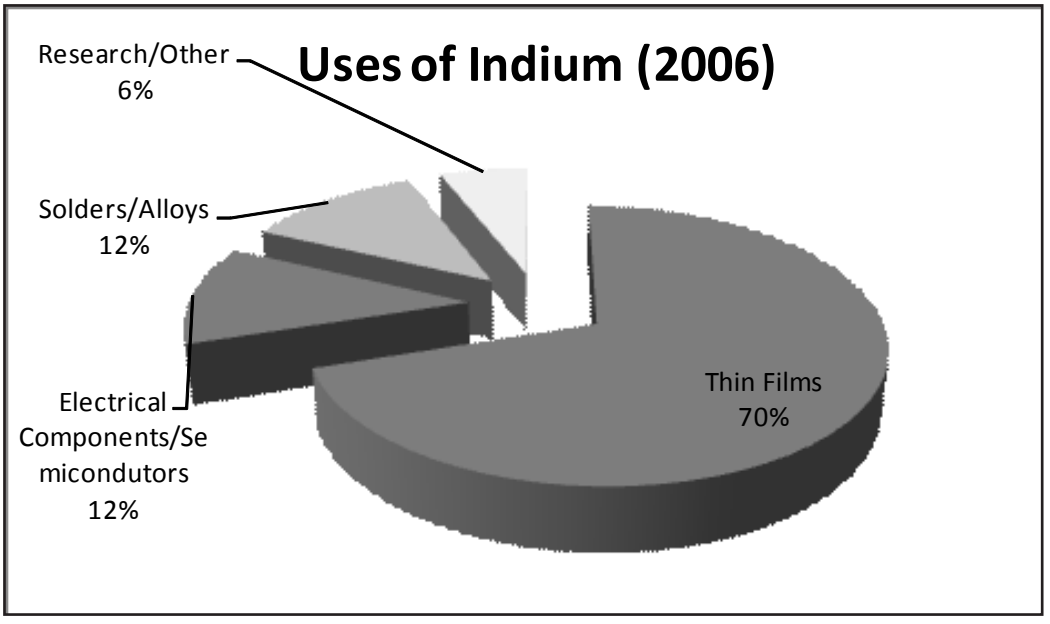
The advantageous character of indium is found in its alloy, indium tin oxide (In_2O_3-SnO_2 or ITO). ITO's appeal is found in its conductivity and transparency in thin films. The ability of having a material that is both conductive and transparent is a necessity for liquid crystal displays (LCDs), plasma displays, touch screens, and a variety of other optical and electronic applications. As of 2004, around 70% of indium was being used in these thin film applications.

LCDs and plasma displays require a transparent conductive film to act as an electrode in front of the light emitting mechanism. Primitive LCDs (such as alarm clock displays) exhibit a mostly opaque electrode, which is why the structure of the light emitted is restricted to a certain shape (such as the 8's seen on a deactivated alarm clock). For more moveable and fluid displays, like the flat panels we use today, a transparent conductor must be used as this electrode. Touch screens find themselves in a similar predicament. Touch screens fundamentally work on the contact of two thin electrodes cause by touch from the user. The contact of these electrodes changes either the capacitative or resistive qualities of the layer between them, depending on the nature of the touch screen. Obviously, for these electrodes to be placed on top of a screen the user can see, the electrodes must be transparent. Hence the need for a conductive, transparent film such as ITO in all touch screen devices.

Indium's ascension from a rare and obscure element to a valued and contributing member of the periodic table may now seem like a warm feel-good story as of now. However, the tough times are yet to come. The price of indium has risen dramatically in the past ten years and shows little sign of slowing. In 2002, indium sold

for an average of $97 per kilogram. At one point in 2006, the price reached $1000 per kilogram, although the decrease of the general commodity market now places the price at around $800 per kilogram. Nonetheless, an 800% increase is nothing to scoff at as demand continues to increase and supply seems to remain stagnant.

This overwhelming statistic is not lost on electronics companies and their stock holders. The current estimated reserve of 6000 tons of indium suggests a lifetime of a mere 13 years at today's consumption rates. The Indium Corporation, the world's leading indium supplier and processor, maintains that increased recycling, recovery, and unexplored mining techniques should continue sustainable indium production to meet future demand. Although this may seem like a desperate attempt to secure the company's viability, it should be noted that silver, an element three times less abundant than indium, is at a production rate 40 times that of indium. This and many other similar examples lead many to believe that the lack of indium production is due to its recently discovered utility. However, some still suppose that silver and metals like it are easier to process and found in higher concentrations in natural ores, causing an imbalanced statistic.



Much like the fear of oil depletion leading to alternative energy research, many research firms and electronics manufacturers have attempted to cash in on the increasing price of indium by discovering new competing technologies for transparent conductive films. However, much like the oil conundrum, nothing yet has been able to compete with ITO's cost, reproducibility, and all-American-ness. ITO can be deposited into thin, highly conductive and highly transparent films by such processes as physical vapor deposition, sputter deposition, and electron beam evaporation. All these processes, especially with ITO, have been proven to be dependable, reproducible, and perhaps most importantly, reliable for large-volume production.

However, there are many promising ventures still currently in the research phase. Framingham's own Eikos Inc. has recently developed an award-winning transparent conductive film using carbon nanotubes. Many research groups at the university and commercial level, such as GVD Corporation in Cambridge, have been working with a variety of conductive polymers, notably polypyrrole (PPy) and poly(3,4-ethylenedioxythiophene) (PEDOT). The problem with these films is that, like indium, as the conductivity increases, so does the thickness, which means less transparency and a more tinted appearance. A balance of conductivity, thickness, and opacity has not yet been found as successfully as with ITO as of yet. For conductive polymers, specifically, the conductivity can be controlled by organic synthesis adjustments and doping, however a reproducible and competitive process has not yet been formulated. By and large, the methods of depositing these films remains erratic, non-uniform, and difficult to scale. Although promising, the current alternatives would need either a large amount of continued research or a dramatic increase of indium prices to become competitive.

-James Peerless

One Year Later

An Examination of Life after Undergrad

As May rapidly approaches, many of us are excited by the prospects of all the things it brings with it. Warm weather, long days, a rest from finals and papers, maybe even a Dialogue or vacation. For the seniors of 2010, it also means graduation. It's a time to say goodbye to five years of undergrad and to greet the real world of jobs outside the co-op program. For many, this can be a daunting task, especially given the tough economic times we all seem to be graduating into. Recognizing this, NU Science Mag sought to interview someone who has recently been through the same process in order to help set your worried minds at ease. We were lucky enough to speak with ***Liz Mandeville****, a recent graduate of Yale University, currently working in Laramie, Wyoming. Read on to discover how she has been navigating the science community since leaving school, and her input on how to be successful out in the real world.*

What is your undergraduate degree in?
Ecology and Evolutionary Biology- Class of 2009!

What were your first thoughts upon graduation?
I was burned out on academic work after I graduated, and knew that I didn't want to go to grad school yet. I also knew that I wanted a job that kept me in biology and preferably would get me outside in the summer.

When did you start looking for a job and how did you go about doing so (helpful websites, etc)?
I looked for jobs in a couple of different ways, starting in February of my senior year. The two most helpful resources I've found for jobs in ecology and other non-medical biology are the ECOLOG listserv and the Texas A&M Department of Wildlife and Fisheries Job Board. ECOLOG tends to advertise more long-term and more benefited positions lasting a year or more. The Texas A&M job board advertises more temporary field positions, where you do outdoor fieldwork for a project for a few months.
You can also take a bold approach that sometimes works- if you know of a researcher whose work interests you and who you'd like to work with, you can go out on a limb and contact them to ask for a job. More often than not people say no, but it can't hurt to try as long as you are polite and genuinely interested.

Where are you currently working and what are you doing?
I currently work at the University of Wyoming in a lab that studies interactions between pine trees and seed predators/dispersers (think small mammals and birds). This past summer, we worked for three months at a field site in southeastern Wyoming, about 60 miles north of Laramie. We lived in tents at an abandoned homestead and hiked around the hills collecting pinecones and taking tree measurements. We also did some small mammal trapping and tracking, as a way of determining how active the seed predators were and what kind of small mammals they were.

What's the coolest thing about your position?
The fieldwork was by far the best part. If you like to hike, camp, and generally be outdoors, field ecology projects are a lot of fun. I'm from Connecticut and also went to college in Connecticut, so Wyoming was an entirely new experience. The landscape is so different and so dramatically beautiful in this part of the country, and doing field work allowed me to really experience the landscape in a way that you don't really get in a day trip or even a longer backpacking trip. The isolation was also really cool. The only people anywhere near us were the ranchers who run cattle out there (by the way, cowboys still exist), and the nearest town (population 200) was 30 miles of dirt road away.

Nifty fact about squirrels. Shoot.
I actually don't work on squirrels- other people in my lab do, but I don't. Squirrels out here are pretty territorial, and will bark at you whenever you enter their territory. It's pretty funny to be threatened by a tiny squirrel chattering away on a tree branch above your head.

Was it difficult to find a job relevant to your degree?
The economy crashed two weeks into my senior year of college, so that made job searches particularly difficult for my graduating class. It's also difficult to apply for research assistant positions with a bachelor's degree, since you're often competing against people with master's degrees (for the better, longer jobs) or undergraduates who will work for free (for cool summer field experiences).

Which undergraduate courses have been the most helpful/applicable to your current job?
I actually find my senior thesis work (conducting a project in a lab) more helpful than any of my coursework. Practical experience is a great thing to have when you're working a field or lab job.

If you could go back, would you do anything differently to become more marketable?
I would go back in time and learn more about molecular techniques like PCR. I feel like that's a major weakness I have right now applying for research assistant jobs.

Are you looking into grad school? What aspects of undergrad are useful in this process?
I plan to apply to grad school next fall, and hopefully start a PhD program in fall 2011. There's no one magic factor that will get you into grad school- people come to graduate programs at all different points in their lives from all sorts of backgrounds. So I'm hoping that my research experience will compensate for my lousy orgo grade, but a good orgo grade is certainly not going to hurt either. Look at the requirements of the specific grad programs you think you might be interested in- that will tell you where to focus your energy if you think you might want to go to graduate school.

What is your best piece of advice for an undergrad?
I'd say that if you think you might want to be a research scientist, you should get involved in research as an undergrad. Not everyone who likes science likes research, and it's really better to figure that out about yourself before you do something like commit to a 5-year Ph.D. program.

-Kristina Deak

Too Big to Fail

72% of the earth's surface is covered by ocean. This immense body of water regulates everything from global weather and heat distribution, to means of livelihood and the production of an active food source for the human race. The health of aquatic ecosystems is critical to our existence as a species, and the biodiversity of the world at large. Unfortunately, the same outlook we had with major banks and corporations during the financial crises of 2008 is related to our treatment of this valuable resource. Until recently, the human race believed the ocean was simply too large to be effected by our diminutive actions. However, with ballooning population sizes and advancing technologies, the damage we do is being compounded beyond anyone's wildest predictions. Fisheries are nearing depletion, coral reefs are being destroyed, and global climate change is beginning to take its toll. Let's dive into some of these problems further, and see just what each of us can do to help relieve the stresses placed on the water systems of the earth.

No More Nemo

The concept of fishing and exploiting the oceans living creatures for sustenance has existed for as long as man has been dwelling along the waters edge. As populations grew, so did demand. In the past decade the global annual catch was estimated to be about 100 million tons per year, amounting to 20% of the world's protein intake. The problem is that this immense amount of biomass was taken from about 200 fish stocks, half of which are exhausted or rapidly depleting due to rapid exploitation. Government regulation is in place to promote sustainable fishing, however it is impossible to monitor each fisherman that sets sail. With ease of globalization and transportation, 75% of the world catch is consumed in different maritime zones from where it was caught. Additional regulation and monitoring will be necessary to both protect endangered species and to allow the fisheries to continue to be a viable economic market.

Ocean Acidification

Over 30% of the carbon dioxide released from human activity, such as the burning of fossil fuels, is absorbed directly by the ocean. When it enters the water, a huge alteration in ocean chemistry and composition occurs, which in turn has dramatic effects on the life forms found therein. In fact, scientists postulate that at least two mass extinctions (251 and 55 million years ago) were accompanied by intense ocean acidification. Already, the surface waters have increased in acidity by 0.1 pH units from pre-industrial levels. By the year 2100 it is projected that an additional acidification of 0.3 to 0.4 pH units will occur, which will create conditions unseen for over 40 million years. Says Professor Hoegh-Guldberg from the Marine Institute of Barcelona, "These changes are taking place at rates as much as 100 times faster than they ever have over the last tens of millions of years."

Coral Complications

One of the greatest tragedies facing the ocean ecosystem is the rapid loss and plausible extinction of coral reefs. Several components of global warming, from increasing temperature to the above mentioned ocean acidification, cause great harm to the already fragile coral systems of the world. One such complication is the instance of coral bleaching. Corals obtain energy from the brightly hued algae that live in their tissue. When the waters warm, this symbiotic relationship is disrupted, which kills the algae. Thus, as the coral loses these colorful fuel sources, they become white and die. As if this wasn't bad enough, ocean acidification is capable of putting all coral systems at risk of extinction as early as 2050, which would cause a series of extinctions throughout the interrelated food web of the sea.

What Can We Do?

The above problems seem like enough already, but the ocean is faced with many more problems, including sea level rise, pollution influx, and the loss of 90% of the top predator in the food chain, sharks. As daunting as these issues are, it is up to our generation to help alleviate them. You don't need to be an oceanographer or marine biologist to help with this project. Some simple ways to do your part include:

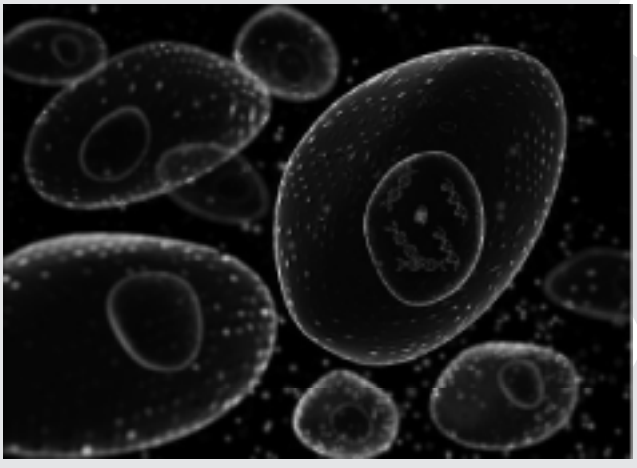
1. Avoid using chemically-enhanced pesticides and fertilizers. They can drain directly to the ocean.
2. Many local dive shops run conservation trips or are involved with conservation groups, see if you can get involved!
3. Recycle. Every piece of plastic you recycle is one less that could end up floating in the Pacific trash heap for hundreds of years.
4. Most importantly, educate yourselves and others. This article is just a stepping-stone to the major problems plaguing our seas. The more you research, the more you can help.

-Kristina Deak

THE 'PRIMORDIAL SOUP' THEORY DEBUNKED

For over 80 years J.B.S. Haldane's primordial soup theory has been accepted as the accurate explanation for the origin of life. A recent paper in Bioessays, however, questions the validity of this popular theory and brings to light an alternative beginning to life on earth.

In 1929 Haldane proposed that a prebiotic broth of inorganic compounds (water, ammonia, etc.) in earth's early oceans converted into organic compounds which then further reacted with each other to produce larger molecules and, eventually, cells. UV radiation and fermentation supplied the energy for these reactions. This theory has evolved to generate a view of early earth as an "RNA world" where RNA is seen as the basis of catalysis and replication. Ribonucelic acid (RNA) is a derivative of Deoxyribonucleic acid (DNA) and plays a key role in protein synthesis in all living cells today. The theory maintains that nucleotides reacted in the warm soup to initially form RNA.



Recently, biochemists Nick Lane, John Allen and William Martin found some problems with this theory. They noticed that there lacked a continuous source of chemical energy necessary for RNA polymerization. Cells today get their energy from a chemical known as ATP, adenosine triphosphate, and the current theory does not explain how the first ATP would be formed. No life-forms today use UV radiation to synthesize ATP, and fermentation is too sophisticated to be found this early in the evolutionary time-line. Their answer seems almost too obvious: chemiosmosis, a mechanism present in all cells today, supplied the energy needed for life on earth to evolve.

No life-forms today use UV radiation to synthesize ATP, and fermentation is too sophisticated to be found this early in the evolutionary time-line

The alternative theory they propose suggests that polymerization and replication of primitive nucleotides originated in under-water geothermal vents. A hydrothermal vent is like a geyser on the ocean floor. They continuously eject hot water with a high mineral content which supports a varied array of life-forms that otherwise could not survive at such depths. They are also thought to play an important role in ocean current patterns, temperature and chemistry. Thermal currents tend to gather nucleotides in high concentration at the cooler regions of a vent making synthesis of RNA more likely. Also, temperature fluctuation in a hydrothermal system, due to thermal diffusion, simulates the heating and cooling system of PCR resulting in melting and annealing of nucleotides.

In 2000, serpentinization hydrothermal systems were discovered. These vents form from a reaction of seawater with a mineral called olivine, a large component of the ocean's crust. The process of serpentinisation involves the hydroxylation of olivine to serpentine which expands and fractures allowing for seawater to continue to flow through the structure and further the reaction. These systems are ideal for an RNA world: warm (around 70 degrees C), basic with pH between 9 and 11, hydrogen rich and porous in structure. It was vents like these that may have served as the energy source for primordial life. In fact, the synthesis of amino acids under vent like conditions has been shown in the laboratory. The origin of life may just have been a 'side effect' of direct hydrogenation of carbon dioxide in the creation of methane or acetate. The inorganic catalysts present in the hydrothermal fluid promote certain reactions over others determining the nature of the first biochemical pathways – effectively demonstrating a pre-genetic natural selection.

Chemiosmosis is a gradient of proton concentration across a membrane that drives the synthesis of ATP. Proton gradients are universal and fundamental across all life. The acidic oceans of the past made the alkaline vents chemiosmotic. Natural proton gradients formed across inorganic membranes, which produced a proton motive force. In fact, the proton gradient had a polarity identical to that in cells today. Chemiosmosis allowed for the generation of energy in ancient cells. Ancestral ATP-ase, the enzyme that catalyzes synthesis of ATP arose in alkaline vents where it harnessed the natural proton gradients to generate ATP. Over time, cells evolved to create their own proton gradient and generate their own proton motive force without the help of the outside environment. Life could not have left the vents if it did not take advantage of the natural proton motive force.

-Tara Dhingra

How Farming Techniques are Reaching to New Heights

At present, the earth's 6.8 billion inhabitants require an area the size of South America -6,890,000 sq miles- to sustain all food production. It is projected that our global population will increase to 9.5 billion people by the year 2050, which means that an additional Brazil-sized land mass will be necessary to maintain growing appetites. An arable and available region this size simply does not exist on our planet, which forces us to seek out alternatives for producing the food we need to survive.

As climate change rapidly increases, the amount of viable land for agriculture diminishes due to drought, flooding, desertification, and human-caused pollution. Agriculture alone consumes over 70% of the earth's available freshwater, and pesticides, herbicides, and other poisonous compounds prohibit this precious resource from being recycled. In addition to water waste, the farming industry expends over 20% of fossil fuels in the US alone. This vast consumption of fuel links the price of food directly to the price of oil, making it hard for lower-income individuals to eat healthier foods that require more care. Pollution from fertilizers and pesticides contaminates our groundwater reservoirs, and causes lethal algal blooms that kill millions of fish per year. Food borne illnesses and pathogens including salmonella and Escherichia coli account for millions of deaths per year, and they are on the rise in areas where fertilizing methods remain primitive, i.e. the use of human feces in many parts of Asia, Africa, and South America.

In response to these dilemmas, the global science and agriculture communities are testing and developing revolutionary methods for food production that could support our growing population in a sustainable manner. The best solution would be to grow crops indoors, under strictly maintained conditions, in and around major cities, and in a vertical fashion. Although real estate within major cities like New York and Boston is typically high, there are always less desirable and even vacant lots waiting for new development. Food grown in glass hi-rise structures can produce food year-round, while conserving vast quantities of water, eliminating threats of food borne illness, and protecting natural habitats from destruction and irreversible pollution.

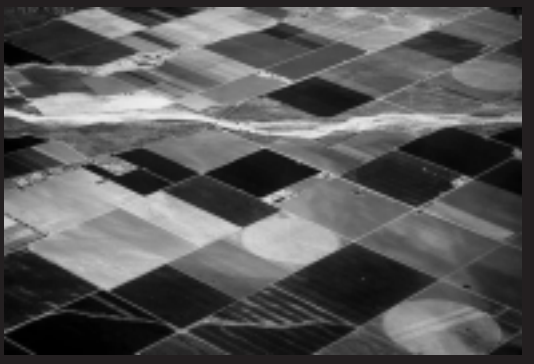
Numerous methods for growing plants indoors in a sustainable fashion have proven to be exceptionally efficient and economically sound. Drip irrigation eliminates water waste via tubes that target each individual plant and deliver only the amount of water necessary for growth. Aerophonics were developed in 1982 by K. T. Hubick, and were later advanced by NASA scientists. This method involves plants grown raised in open air that is steeped in nutrients and water vapor, which removes the need for soil. A third method for indoor ag-

riculture, and one that is very common today is hydroponics. Introduced in 1929 by William F. Gericke, it is the grandfather of all indoor growing techniques. Plants are held in place so their roots grow in soil-less channels, and nutrient-rich water encompasses them. Indoor hydrophonic farms in operation today prove the effectiveness of indoor food production on a large scale, and vertical structures 30 stories in height could lead humans toward a sustainable future.

Size plays an important role in the production of large-scale indoor growing facilities. The average city block covers an area of roughly 5 acres, and the average US citizen requires 1.8 acres of land per year to sustain a daily 1,500-calorie diet. It is estimated by the US Census Bureau that the population of the United States will be roughly 419.9 million by the year 2050, which means we will need a total of 777.8 million acres of land to sustain the great American diet.

Each floor in a vertical farm will have four growing seasons year-round with double the plant density in normal settings, and could provide two layers of food production for each level to maximize efficiency. This yields a multiplying factor of 16 (4 growing seasons x 2 layers x 2 doubled plant density). So for every 30-story farm you could produce a total of 2,400 acres of fresh, sustainably grown food (16 growing factor x 30 stories x 5 acre city block). If the US completely shifted from land-based farms to indoor farming, we would need to construct 324,000 of these 30-story buildings. The total land area used for crop production in the US is 406.4 million acres, which excludes land used for grazing livestock, and forestry. If we were to limit food production to these high-rise buildings, only 1.6 million acres of ground-cover would be needed to sustain the hungry population. Now imagine the amount of CO2 that extra 404.8 million acres of untouched land could guzzle up if it weren't plowed and ravaged by machines.

Before any hi-rise crop production facilities are constructed, we must supply them with sustainable forms of energy. Throughout the US we have access to



several types of renewable energy that is waiting to be harnessed: geothermal energy (out West), high wind energy (along coasts and in the Midwest), wave energy (along coasts), hydraulic energy (dams and reservoirs) and solar energy (areas where annual precipitation is low). Combined, the United States has the capacity to run all of these growing facilities year-round with the energy provided by the earth and sun. Water utilized for irrigation can originate from newly cleaned water from waste processing plants (yes, all the gunk is 100% removed), which would otherwise dump the clear freshwater into the ground or nearby water bodies. Although initial energy costs for mass production of hi-rise farms is expected to be high, the overall energy and resource savings in the long-run far outweigh these expenditures.

It is exciting to imagine a world where "Locally Grown" food is commonplace throughout mainstream society. Studies indicate that 30% of all food that is harvested per year in the US is lost due to spoilage and infestation during shipment and storage. Hi-rise farms would increase the accessibility of fresh, healthy foods to all US citizens regardless of one's annual income. If we make the shift in our agriculture standards, we will not only improve the overall health of our citizens, but the health and well-being of our earth. It's about time we get off our plows and stop toiling in the fields. It's about time we grow up.

-Emily Snead

- 20% of all gasoline and diesel fuel consumed in the US per year is used for agriculture
- A one-square-block farm 30 stories high could yield as much food as 2,400 outdoor acres
- At present the 6.8 billion people on earth require a land mass the size of South America to sustain crop production
- By 2050 it is expected that the global population will reach 9.5 billion people, further requiring an additional Brazil-sized area dedicated to crops

Three technologies for indoor farming:

1. **Aerophonics: Plants are hoisted in the air so their roots can absorb air infused with nutrient-rich vapor. This is especially good for root crops (carrots, potatoes, onions)**
2. **Drip Irrigation: Plants flourish in troughs of lightweight material that can be reused for many years as small tubes supply water to each individual root system. This cuts back on wasteful water use.**
3. **Hydrophonics: Plants are secured in place so their roots lie in open troughs as water with dissolved nutrients is continuously circulated over them. Want to try it out? Buy "Boston Lettuce" from WholeFoods Market.**

REALLY COOL CO-OP JOBS FOR SCIENCE MAJORS!

Aquatic Veterinary Technician Assistant-Walt Disney World, *Orlando, FL*

Job description: Assist veterinarian and manage equipment necessary for medical procedures and surgeries, as well as supervise prescriptions, take pictures and document procedures.

- "I discovered Disney's Profession Internships online after going to a presentation that the Disney College Program did at Curry Student Center."
- "I was able to do hands-on work with manatees, dolphins, sharks, stingrays, sea turtles and a wide variety of fish."
- "I now have great networking connections with the veterinarians, letters of recommendation and a better understanding of what my life would be like as a marine veterinarian!"

-Nikki DeMoro, Biology, 2011 (1st co-op)

Did you know that Northeastern is the world leader in cooperative education? With the upcoming "four-year option," many students will be missing out on multiple co-op experiences. We want to remind you of the unbelievable benefits that this program has to offer. Please listen to us, as upperclassmen when we say, "Do CO-OP and stay five years!" Graduating is overrated and jobs are hard to come by without applicable experience. Take a look at some of the amazing opportunities and listen to some of our very enthusiastic students/science majors as they describe their co-op journeys!

-Andrea DeDonato

Marine Research Assistant- Darling Marine Center, *Walpole, ME*

Job description: Take both preserved and live plankton tow samples at two stations in the Damariscotta River. Analyze live samples for the copepod Calanus finmarchicus, and record various data, take images. Collected various environmental meta data, such as temperature readings and chlorophyll levels.

- "I set this co-op up myself. I knew one of the staff scientists at the center through a friend, and he passed my resume out to a few researchers he knew were hiring. He also helped me find someone who currently had grant money to pay an intern."
- "I was able to participate in a research cruise with the Bedford Institute of Oceanography, out of Nova Scotia. I stayed on a ship in the North Atlantic for a little over two weeks, and took samples at about thirty stations from Nova Scotia to Newfoundland!

-Hannah MacLeod, Biolgy/Marine Biology, 2012 (1st co-op)

Mars Data Analyst and Researcher- Jet Propulsion Lab-NASA, *Pasadena, CA*

Job description: Interpretation and analysis of remotely sensed data captured by rovers and satellites on Mars. Findings influence the final landing site selection for the Mars Science Laboratory Rover Mission, scheduled for late 2011.

- "NASA offers numerous work opportunities for undergraduates, and I applied for a position as a USRP (Undergraduate Student Research Program) student."
- "There are over twelve NASA centers throughout the United States in which you can intern. The too-good-to-be-true weather out here in sunny California beats snowy Boston anytime!"
- "I have shadowed my supervisor while he and a team of scientists contact the Opportunity (and Viking perhaps) roverand Spirit rovers on Mars, and give it them new daily commands; I'm watching them drive the rovers on Mars!"
- "You have the chance to collaborate with world-renowned scientists in a positive learning environment and perhaps do something you never thought possible."

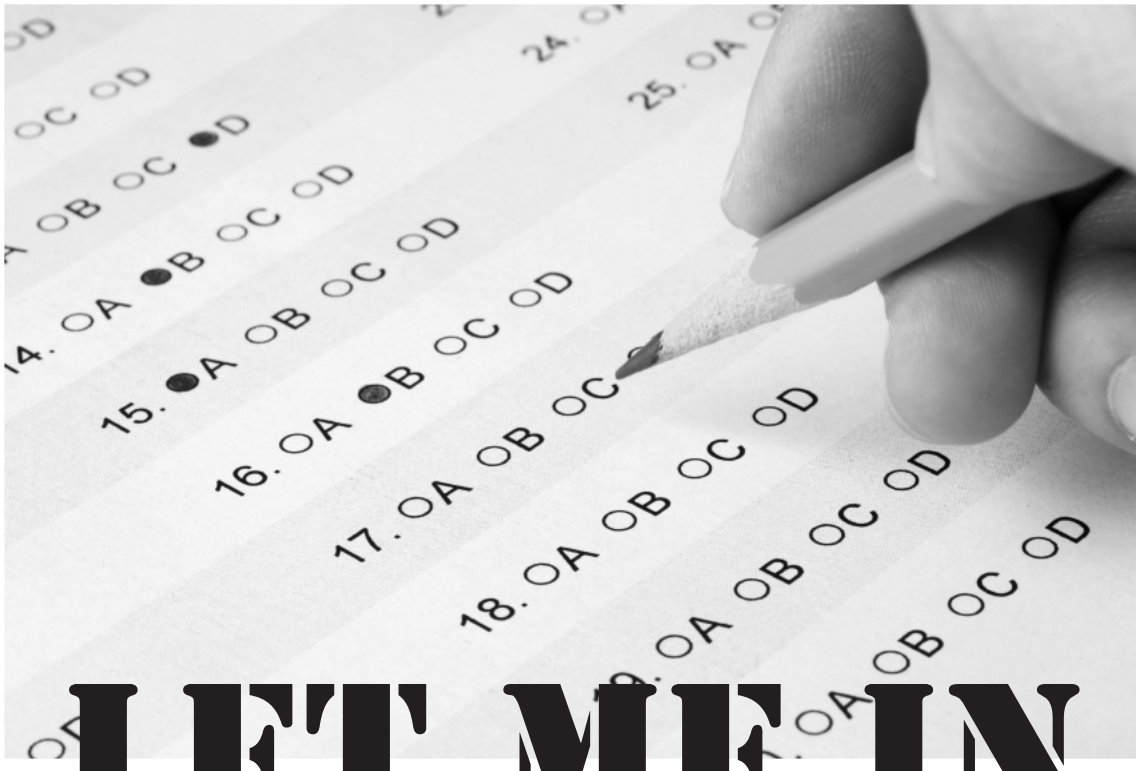
-Emily Snead, Environmental Science/Geology, 2012 (1st co-op)

Giant Ocean Tank Assistant Aquarist/Diver-New England Aquarium, *Boston, MA*

Job description: Five scheduled dives a day: 4 feeding dives and 1 maintenence dive. Fill tanks with air on an as needed basis, replenish food supplies, do laundry, clean and update feeding records and dive logs. Every day is different so one day you may be clipping barbs off the sting rays and the next you may be acclimatizing new Groupers in the Giant Ocean Tank. Every day is an adventure at the Aquarium.

- "This co-op job exposes you to so many intelligent and dedicated people in the marine science field that you are bound to encounter someone with the same interests as you that can help point you in the right direction for your future career."
- "You learn about the whole Caribbean ecosystem and its inhabitants and you learn how to recognize different species of fish, their behaviors, and their roles in the ecosystem."
- "You are scuba diving 3 to 5 times a day!"

-Natalia Widulinski, Environmental Science/Marine Bio, 2013 (1st co-op)



LET ME IN

An evalutation of the medical school admissions process

Have you ever asked a child what they want to be when they grow up? Their answer usually is quick, straightforward, and from the heart. If only the attainment of those dreams was really that easy.

In the past year there have been approximately 43,000 applicants to medical schools across the nation. Each an eager, young, bright, ambitious, and determined individual. So which ones will the medical schools, chose? Unfortunately, not many. The "average" student frequently has a difficult time getting accepted. Yet most of these same students hold the passion and the drive to become practicing doctors. So is the process of applying to medical school justified? Are all the criterions necessary? Is selection too exclusive? The imperfections in the system not only bear stress and anxiety among the pre-meds, but also potentially turn away perfectly qualified students. So from the perspective of a pre-medical, undergraduate student, the admissions process needs to be re-evaluated. As Professor Jillian Morrison of the University of Glasgrow states: "It is important to get selection right because the vast majority of entrants go on to qualify and practice as doctors. Admission to medical school is, therefore, the main hurdle over which aspiring doctors must jump." So lets take a look…

Although discrepancies among different medical schools regarding admissions requirements exist, we can gauge that the most critical factors in an application are the grades and the MCAT scores of applicants. The Association of American Medical Schools states that the average accepted GPA is approximately a 3.6. Is this a justified "calculation" of an applicant's intelligence? In "Getting Into Medical School", author and physician, Sanford J. Brown, M.D., questions the legitimacy of the GPA: "…medical school admissions committees must consider whether the grade itself is a valid measure of the applicant's performance." We're all smart, or else we probably wouldn't be applying to med school. But can you differentiate based on a simple grade point average? Each college is going to have a different set of standards for what constitutes an "A" or any other letter grade. Each university will have its share of easy and challenging teachers, whose grading principles vary. Despite the work ethic and intelligence of the student, these factors can have an overshadowing effect.

According to the American Association of Medical Schools, the MCAT is: "…designed to assess the examinee's problem solving, critical thinking, writing skills, and knowledge of science concepts and principles prerequisite to the study of medicine." Students view it as time, preparation, and money that all adds up to a threatening test, the results of which determine the rest of their lives. Many others see it as a "predictor" for those who will do well in medical school and go onto become good practitioners. I believe it is probably just as flawed as relying solely on the GPA. According to Sanford J. Brown, "It does not differentiate between good and excellent medical students and sheds no light on an applicant's suitability to be a physician. The only purpose it serves is to make admissions

committee's job easier." Narrowing down thousands of applicants can be a tough position. GPAs and test scores do provide an easy way to filter out the unqualified students and create a "cutoff mark." The MCAT is very valuable to the process. But once again, can we rely solely on this "assessor" to choose the medical doctors of our future generations? Or are there alternative ways to determine the character and ability of each med school applicant?

Professor Jillian Morrison refers to a study in which certain tools are suggested to aid the selection process:
"While there are undoubtedly many attributes we would expect our future doctors to possess, the specific qualities under investigation in these studies include being able to work as part of a team, and being empathic, competent and ethical."
Perhaps devising tests that concentrate more on what to do when faced with medical challenges or ethical dilemmas would be more beneficial than testing one's abilities to memorize facts. There is more to what makes a good doctor than just a number on a report card or exam. The drive and passion a prospective student of medicine has toward helping others is what characterizes a good physician in the future. And according to the 2008-2009 Medical School Admission Requirements, "the most critical aspect of practicing medicine is the physician-patient relationship." There certainly is no GPA, or MCAT score that can determine this fundamental aspect of medicine.

"There is more to what makes a good doctor than just a number on a report card or exam."

The barriers don't stop there. In Sanford J. Browns, "Getting into Medical School," he claims, "an unusual major, where you are from, where you grew up, ethnic background, economic background, special accomplishments…" are what give you a competitive edge in the application process and make you stand out amongst thousands of others. Most of us chose the most direct route, Biology or Chemistry. This translates into a huge group of students that have it all, the same criteria, yet they still remain "average" amongst the others because there isn't that one defining thing that makes them stand out. Linda Chaviz, president of the Center for Equal Opportunity, claims that, "Black and Hispanic students are being admitted to medical school with substantially lower college grades and test scores than whites and Asians." This issue of racial preferences also acts as another barrier to overcome; another reason that the average student is being turned away.

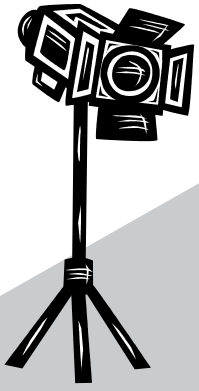
The application process has the ability to turn students away before they even apply. As a student, I am familiar with many of my classmates who have changed majors or gave up on medical school because of the tremendous amount of intimidation caused by the work, the time, and the stress. Undergraduate years are a critical time in the development of a young student. These changes have the ability to cause depression, anxiety, or any other psychological effect on any average young person. Add to that chemistry, organic chemistry, general and advanced biology, physics, calculus, writing, labs, and recitation classes. Then add the stress of accumulating a great GPA, getting amazing MCAT scores, devoting time to research, community service, and a professional job, and searching for something that makes you different amongst thousands. Now you're talking to a pre-med student. Of course it is a choice to take on a difficult field and one must accept what comes along with it. Some may counteract that this is all a part of the process that helps to weed out those who cannot deal with the stress of being a doctor. Yet at this critical time in a young person's life, one's decisions affect the outcome of their life. One may completely ignore the medical field because of that intimidation. The process has the ability to scare away perfectly qualified students who may not believe that they are good enough or can make it to the end.

Are medical schools looking for crazy people? This contorted process of actually getting there, has the ability to negatively effect student's emotional and mental health, which can only bear negative effects on quality patient care. Eaton and Levene, both professors at the University of Leeds, agree, stating: "Poor clinical performance can be related more to personal and motivational stress factors than any demonstrable differences in medical skills or knowledge." Clearly stress can be seen as a greater detriment in critical situations than constructive or beneficial. It can be traced all the way back to the beginning, the admissions process. Of course, it is a great hurdle and any accomplishment is accompanied by stress, but maybe it would be simpler if we had a more direct route, and a more feasible goal, instead of being completely intimidated by this medical school barrier.

If only there were a simpler order, instead of this intangible aspect. If only we knew exactly what the medical schools wanted! Deciding how to achieve that is up to us, and still presents the challenge. Students are scratching at the door trying to get in, begging for the chance, the opportunity of a lifetime. What makes me different from the others? The challenge is to keep going, to survive against all odds. We'll make the cutoff. We'll have the GPA, the MCAT score, the volunteer work, research, and all. But we'll keep knocking…and knocking…and knocking, contemplating why no one will answer. Is it luck? Fate maybe? Or does it all lie in the hands of a contorted process. And maybe it will divert me in another direction. That barrier has the potential ability to hold me, and many others, back from becoming great doctors. Honestly and truly, I appreciate the challenge, for it has made me a more driven and focused young woman, but I would only wish that my future, my desire, my dreams were in the palms of my hands instead of at the discretion of an unjust selection process.

-Andrea Dedenato

Spotlight on:



Professor Stephen Vollmer

A member of Northeastern's biology department, you may know professor Steven Vollmer from the classes he teaches between two NU campuses. His lecture courses on Genetics and Molecular Biology are taught here at our Boston campus, but a great deal of his time is also spent at Northeastern's Marine Science Center. Located in Nahant, MA, the Marine Science Center is a teaching laboratory, where research and learning are integrated to provide an up close and personal experience of marine biology.

Vollmer didn't always know that the path he was on would take him to biology. As an undergraduate student at Colorado State University, a career in science was never a definite for him, but it was never out of the picture either. He describes his college years as a time where he was searching for what he could do as a professional in the sciences. Vollmer went on to earn an M.S. from California State University and a Ph.D. from Harvard University.

In addition to his passion for life sciences, Vollmer enjoys cooking. He also takes part in recreational sports such as surfing.

Currently, Vollmer's research focuses on the Caribbean Acropora, Acropora cervicornis, or as they are most commonly known, Staghorn corals. Each year, he and his fellow researchers make a trip to the coasts of Panama to collect samples to bring back to Nahant for research. His studies focus on the genetics of the species, and more specifically, their immune systems. In the 1980's, White Band Disease, a degenerative disease effecting Acropora corals, left these corals on the endangered species list. White Band Disease causes deterioration of tissue, and once infected, leaves only a skeleton of the coral remaining. Unlike humans, who have both an innate and adaptive immunity, Staghorn corals only have an innate immunity, which is in their natural biological makeup. The innate immunity system utilizes phagocytes and other killing cells to help keep the corals in good health, all of which fall flat against White Band Disease. However, some corals, around 6%, seem to have a natural resistance to the disease. Vollmer is mainly working toward the identification of the genetic basis of certain corals' natural resistance to White Band Disease.

"Vollmer's enthusiasm for the subject matter has not gone unnoticed by his students."

As a professor, Vollmer's enthusiasm for the subject matter has not gone unnoticed by his students. They describe him as focused and passionate during lecture. "Genetics with Professor Vollmer is one of my favorite classes. His knowledge gained as a result of research in the field adds depth to the course," stated Ashley McDonald, a sophomore Health Science major.

Professor Vollmer's dedication to his research, as well as to his students, is what makes him such an asset to NU.

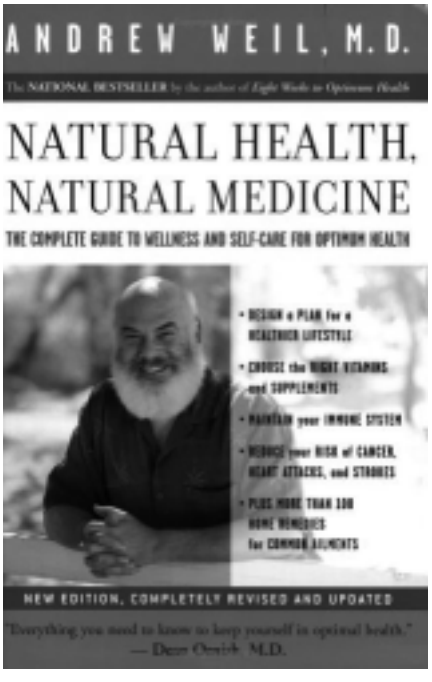
-Matthew Cottle

REVIEW

Natural Health, Natural Medicine

Boost your immune system and dispel immunity myths. Learn how to kick a caffeine addiction. A water filter may actually be worth the money. Actively participate in your health care.

Dr. Andrew Weil's book, "Natural Health, Natural Medicine" (updated edition 2004) can offer insight to both health care professionals as leaders in healing, and to individuals who are personally pursuing healthier lifestyles. The book focuses on practical and often lesser-known preventive practices within a society that is consumed by stress, questionable additives, and rising chronic disease.



Although Weil is now director of the Program in Integrative Medicine at the University of Arizona, he says that almost all of what knows about complementary and alternative medicine (CAM) was learned from practitioners including herbalists, naturopaths, and American Indians. For each pharmaceutical medication that Weil prescribes for a patient, he gives about 40 recommendations for botanicals.

"I have practiced in this way for many years and in that time have not seen a single serious adverse reaction to any of these remedies. No physician who relies on pharmaceutical drugs can match that record of safety," says Weil. The botanicals are effective, especially in conjunction with lifestyle changes, he says.

Section one of the book addresses daily habits, including water quality, quick and simple breathing exercises, inherent food toxins, microwave safety and "A guide to exercise for people who hate the whole idea of it." One of the most fascinating chapters in this section is the FAQ. Weil tackles questions about worrisome versus harmless food additives, cookware metals, food preparation methods and fad diets.

The focus of section two is chronic disease prevention. The importance of immune system fortification is emphasized, with specific advice on lifestyle modifications that he says will help to prevent heart attack, stroke and cancer. For example, in the chapter about protecting your immune system Weil advises on the critical balance between treating infections with antibiotics versus building your own immunity. He refers to his own use of antioxidant supplements and explains the importance of avoiding blood transfusions and radiation exposure.

The last two sections of the book give an overview of vitamins, supplements, and a safe "herbal medicine chest," which lead to the final section, a compilation of home remedies for common ailments. Whereas the section on ailments focuses more on herbal remedies, readers should note that nutrition-based suggestions for ailments are reviewed more in the beginning sections. The book should be read in its entirety for optimal benefit, though it is understandable if individuals skip over ailments in the last section that do not pertain to them.

The appendices provide several simple recipes as well as trustworthy resources for buying CAM supplies and finding CAM practitioners.

Before adhering to every guideline in the book, consider independently researching some of Weil's suggestions. For instance, more recent research suggests that high-protein diets may not impact bone density as Weil implies in his book. Your own doctor should be your primary resource. In addition, reference books, such as The Natural Pharmacy, and nutritional textbooks are also useful for navigating nutritional and herbal supplements. The Natural Pharmacy and other similar reference sources list remedies by ailment, herbal supplement, vitamin and mineral.

Reflect on Weil's idea that healthy lifestyle changes must always be applied with the realization that you are unique, physiologically and mentally. He designed this book to begin empowering the reader to make wiser decisions for a long, healthy, and enjoyable life. "I have given you the best directions I know … put them into action and modify them according to your individual needs," because, Weil says, "you are ultimately the one responsible for your health."

-Shannon Barrow

The Wellness Experience

Stress *does not* have to undermine **your** *college experience.*

The Wellness Group offers alternative resources to combat stress, anxiety and depression--three of the most common issues plaguing college students, according to Diane Hansen, the group's co-creator and assistant director for clinical services at University Health and Counseling Services.

This semester, the wellness "tools" that Hansen and group co-creator and psychotherapist Sasha Juravleva are highlighting focus on mindfulness, focused attention, and focused awareness. Qigong poses and variations of guided meditations are the major techniques incorporated into this semester's sessions.

To better understand meditation, Hansen recreated a stationary "body scan" that students learn during group sessions. The exercise moves full circle, beginning with awareness of your surroundings. Next, focus attention on yourself, moving slowly from head to toe through each body part and releasing tension through breathing. Finally, awareness is refocused by again noticing surrounding noises and then opening your eyes. Afterward, the group reflects on personal differences in mental, physical and emotional states experienced before and after the meditation.

Not all individuals respond best to a stationary approach, remarks Hansen. Alternatively, participants are taught to approach relaxation through movement. During a walking meditation, for instance, participants focus on every movement and muscle involved in the process of walking. Students are encouraged to discuss the effects of the techniques as they put them into practice. Hansen has received positive feedback from students who benefit from breathing and meditation exercises, especially as participants realize there is an alternative to what they thought was the inevitable and inescapable anxiety of college life.

"[Maintaining wellness] is a skill in many ways," says Hansen, and not an ability that everyone is born with. Often students are so consumed by busy schedules that they do not consider long-term and short-term consequences of anxiety-induced increases in heart and respiration rates. Finally, consider that stress management skills developed in college can provide life-long benefits and minimize future stress-related complications.

-Shannon Barrow

In addition to the Wellness Group (formerly known as Complementary Approaches to Health and Wellbeing), UHCS also offers the following groups: Adjustment to College, Relationship Issues, Healing Circle, and Graduate Student Group. For more information, visit http://www.northeastern.edu/uhcs/counseling/group.html or refer to the campus calendar.

REVIEW

Foer's *Eating Animals* Provides Unique Insight into the Concept of a Vegetarian Diet

Jonathan Safran Foer's latest book is not a vegetarian manifesto; rather, it is a call for mindful eating. Eating Animals both explores the cultural history behind why we eat meat and examines modern day practices in the industry. It uncovers connections that most people may not think of, like factory farming's contribution to the rise of influenza pandemics and the virtual lack of genetic variability among livestock. Unlike many other books of the same genre, Foer's discussion branches out beyond health and animal cruelty issues. What makes this book unique is its appeal to pure and simple logic. Foer illustrates this by making a striking argument about eating dogs. This, he argues, would solve many health, safety, and hunger problems. However, the thought of eating dogs is revolting to many Americans. In fact, what we eat seems based more in emotion than reason. A common explanation for why people eat meat? It tastes good. Foer points out that if we lived our entire lives just doing what feels best, we would be rejected by societal norms. The author delves into these emotional connections with personal stories that are reminiscent of his fictional works. These stories, paired with hard facts and investigative research, make this book a must-read for anyone who has ever eaten a hamburger or even a piece of salmon. There are no scare tactics here - the facts are simply against eating meat, and the facts themselves are enough.

-Shannon Barrow

The Humanities Center announces the new Artists and Practitioners in Residence Program

The Program will bring to campus highly innovative and creative individuals whose work spans many different disciplines and who can interact with all sectors of our community: students, faculty, staff, administration, Boston and the Boston-area.
Our first resident doing a mini-residency of two days, April 20th and 21st, is Dr. Lisa Sanders (the brains behind the show "House"). Here is a brief biography of her:

Dr. Lisa Sanders writes the New York Times column "Diagnosis," the basis for the television show House, for which she serves as technical advisor. Sanders's groundbreaking, detective-like approach to diagnosis insists on a multidisciplinary approach to the patient as a whole person. She looks beyond statistics and symptoms to uncover life narratives. An internist at Yale School of Medicine, Sanders's most recent book is Every Patient Tells a Story. She is also an Emmy Award–winning news producer.

This residency is supported by Bouve College of Health Sciences, the School of Journalism and Communication Studies. Dr. Sanders will be participating in an assortment of events throughout the duration of her stay. Two of Dr. Sanders' events are open to the entire community:

Wednesday April 21st from 12:00PM – 1:30PM in 90 Snell Library, Dr. Sanders will have a public lecture and book signing for Every Patient Tells a Story as part of the library's "Meet the Author" series. This event is open to the general public. Food and beverages will be served and copies of the book and House DVDs will be raffled at the event.

Wednesday April 21st from 6:00PM – 7:30PM in Room 201 MU (Mugar Life Science Building), Dr. Sanders will host a discussion for students about career development, utilizing her own interdisciplinary career in health care, medicine, journalism, television and education as a unique example. Refreshments will be served and DVDs of the series House will be raffled at the event.

-Allison Rodriguez

SUMMER MOVIE MAYHEM!

Summer is the perfect time to kick back and relax. A time to distress, unwind, and let those neurons calm down a bit after that last Orgo final. What better way to do so than by watching a horrifically bad sci-fi movie? Who doesn't love watching terrible acting, physical impossibilities, and skewed science facts being exploited on the big screen? This list of 3 awesomely bad movies should help jumpstart your quest for the most heinous abuse of science in the entertainment industry.

1. Mega Shark vs. Giant Octopus – 2009 (The Asylum)

I'll admit, the plot for this film is every marine biologists wet dream. Two prehistoric monsters awaken in the ocean due to melting glaciers (hidden agenda much?) and begin to wreck havoc around the Pacific Ocean. But from this potentially epic storyline, the movie digresses to an atrocious abuse of every law of nature and common sense. At one point the octopus pulls an entire oilrig underwater and proceeds to demolish five submarines in one easy wipe. This is nothing compared to the badass abilities the shark possesses, as it leaps from the water to attack a plane, and chomps a hole right through the Golden Gate Bridge. In the end, the scientists determine the only way to get rid of the beasts is to have them battle it out against each other to the death. I won't spoil the ending, but if you're going to melt your brain anyway this summer, you HAVE to watch this movie!

2. Absolute Zero – 2005 (Front Street Productions)

I'm pretty sure I picked this up for a dollar at Walmart, so that may give an inclination to it's quality and wildly disproportionate entertainment value. Essentially, scientists determine that the cause of the last ice age was due to the magnetic field of the earth switching in a day. Conveniently, they discover this a few hours before it is about to happen again. While this premise could never happen in reality (in time frame, scope of climate effect, and the inability to reach absolute zero), it is quite amusing to watch the world freeze over and birds turn to icicles in the sky.

3. Lake Placid – 1999 – (20th Century Fox)

Imagine you're swimming in a calm lake on a tranquil day. Birds are singing, kids are laughing, and there's not a cloud in the sky. All of a sudden a giant goddamn crocodile lunges out of the water and eats you whole. This is, for the most part, the entire concept of the film, and not a bad one if you're in the mood for a semi-gore-fest. Apparently, the quest for 30-foot-crocodiles is quite appealing for some folks because this movie has spawned two TV only sequels, one of which is to be released this year. So go ahead, apply that suntan lotion and paddle away… while you still can.

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Get involved with NU Science Magazine and have your research read by over 1,000 students in print and online.

We are set to graduate into some of the toughest economic times our country has faced. Now, more than ever, employers are looking for candidates with diverse resumes that display scholarship and leadership. What better way to amp up your next interview than by showing off your work published in a successful campus magazine? It demonstrates your research capabilities, linguistic prowess, and competitive edge, all in one simple package.

NU Science Magazine will be putting together an issue over the summer for release in September 2010. If you have never written for us before, this is a great opportunity to get your foot in the door! First, find a topic that strikes your fancy, then email us about your idea and we'll set you up with an editor. It can be anything from a news piece, to a review of an exhibit, or even about a neat internship experience you had.

All submissions are welcome on a rolling basis beginning May 1st and ending June 30th. Final acceptance of a piece for publication will depend upon the quality of the material, depth of research, and general student body interest.

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