

Effective communication a necessity in any organization

CASEY HANDMER
Contributing Writer

The Dunning-Kruger effect can be paraphrased as “too stupid to realize it.” In more depth, an individual displaying the Dunning-Kruger effect is so ignorant of their ignorance, their self-assessed competence is wildly discordant with reality. Everyone displays this effect to some extent in areas beyond their interests or expertise, but examples of universal affliction are mercilessly rare, especially at an institution like Caltech, and especially not in YouTube comments. In general, people have the ability to incorporate new information and to self-assess and self-correct as necessary.

If we look at organizations, however, this generality becomes a rarity. There are many reasons for this. Top-down organizations often use a simply-connected org chart and have many single points of failure. Throw in an incentive scheme that actively impedes important information moving up the chain and it’s frequently surprising that large organizations can function at all. As an example, problems in the supply chain outsourcing Boeing employed to build the 787 were predicted more than 15 years

ago, and it took at least a decade before senior management did anything about it. Sony has been hacked half a dozen times with no apparent change in corporate culture. The most recent Iraq war was initiated

on transparently false grounds, and none of our checks and balances were able to pull the US back from the brink. On the other hand, Google holds weekly company-wide meetings where anyone can ask a question. Elon Musk (CEO of SpaceX and Tesla Motors) has recommended to “really pay attention to negative feedback, and solicit it, especially from friends.”

Last week I wrote about Media FBI burglary. The FBI, run for nearly half a century by J. Edgar Hoover, became primarily obsessed with furthering its own agenda to the detriment of its supposed mission. The actions and labor of its individual agents were co-opted by an organization that was never accountable to the people it served. With no avenue

for internal dissent, the FBI could and did run roughshod across the freedoms it was supposed to protect. In the end, only the actions of a handful of motivated activists and journalists were able to restore the flow of communication and enable the continuance of democratic functionality.

But it is too easy to point the finger and blame the police. Often, we read a portion of daily outrage at the conduct of some state-empowered law enforcement. Often, it seems that the actions of a few bad cops are enabled by corrupt or dysfunctional leadership. Often, it seems the idealistically motivated majority are hamstrung by the same institutional issues.

Law enforcement is more complicated than this. The golden rule of “do unto others” breaks down when it comes to punishing bad people. My personal experiences in places with no law enforcement has convinced me that police are an essential element of any society of nontrivial size. Yet law enforcement must involve secrecy to protect privacy and the innocent. Law enforcement must deal with the fact that it is primarily concerned with the dispensation of state-sanctioned violence. Law enforcers are to perform difficult,

dangerous, and undervalued labor for the common good. Designing an organization to work in this environment without succumbing to corruption or self-interest is highly nontrivial and requires participation, maintenance, and oversight.

Bonnie Raines, one of the FBI burglars coming to campus on Tuesday, reminded me that all organizations and agencies are composed of individual people: “The average FBI agent felt pretty good about the job he was trying to do. A large number were Irish Catholic young men. They did have idealism about trying to do good. But it can be so easily manipulated. It is so easy to put blinders on. Some of them, we think, probably weren’t all that smart. They didn’t anticipate a break in.” They certainly didn’t anticipate becoming part of a notorious organization bent on crushing the civil rights movement and opposition to the Vietnam War.

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“Designing an organization to work in this environment without succumbing to corruption or self-interest is highly nontrivial and requires participation, constant maintenance, and oversight.”

Konstantin Batygin named to Forbes’ “30 Under 30” list

LORI DAJOSE
Contributing Writer

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Among the many descriptors assigned to Caltech scientists, “rock star” is not the most common.

But when Konstantin Batygin (MS ‘10, PhD ‘12), an assistant professor of planetary science at Caltech, was recently included in Forbes’s “30 Under 30” list in the science category, the editors used just those words, describing Batygin as “the next physics rock star.” And indeed, in addition to having already published 21 papers as first author, the 28-year-old planetary scientist is a lead singer in a band called The Seventh Season.

The Forbes list, now in its third year, spotlights 30 “game changers, movers, and makers” under 30 years old, in 20 different categories ranging from venture capital to music.

When he is not playing gigs with his band or flying remote-controlled planes—a favorite pastime he picked up during graduate school—Batygin researches the evolution of

planetary orbits, from their chaotic beginnings to the eventual end of their parent solar systems. By studying the dynamical structure of our own planetary system, Batygin and his team are developing a theoretical understanding of the



Photo Courtesy of Lance Hayashida/Caltech Marcomm

Batygin also studies the interiors of exoplanets. Many of the exoplanets that have been discovered reside in close proximity to their host stars and so are bathed in intense stellar radiation. This can cause their atmospheres to become electrically conductive. Batygin studies how the interaction between an exoplanet’s magnetic field and its electrically charged atmosphere can induce electrical currents that heat the planet’s interior and perturb atmospheric circulation patterns.

“I am deeply humbled by this recognition,” says Batygin. “More than anything, this is a tribute to the outstanding mentorship that I have received over the years from my advisers, particularly during my time here at Caltech as a graduate student.”

Batygin is not Caltech’s first talented young researcher to be recognized on the “30 Under 30” list. Assistant Professor of Biology Mitchell Guttman has appeared on the list

twice; two Caltech alumni and two other such systems throughout the galaxy.

graduate students have also made the list previously.

Professors Djorgovski, Brunschwig named fellows of the AAAS

LORI DAJOSE
Contributing Writer

This is an excerpt of an article originally written for the Marketing and Communications Office. The full version is published online at caltech.edu.

Caltech Professor of Astronomy George Djorgovski and chemist Bruce Brunschwig are among the 401 newly elected fellows of the American Association for the Advancement of Science (AAAS) for 2014.

The AAAS was formed in 1848 with the mission of “advancing science, engineering, and innovation throughout the world for the benefit of all people.” The annual tradition of electing fellows began in 1874 to recognize scientists for their contributions toward this mission.

“The AAAS performs an essential role of promoting and protecting science and its benefits for society. This has never been more important than it is now,” says Djorgovski, director of the Center for Data-Driven Discovery at Caltech. He was elected by his scientific peers to the AAAS’s Section on Astronomy for his “leadership of the Virtual Observatory and the emerging field of astroinformatics, and considerable body of work on surveys and transient discovery.”

“Science is being transformed by computing and information technology, and astronomy has been at the forefront of these developments,” says Djorgovski.

Brunschwig, director of the Molecular Materials Research Center (MMRC) at Caltech, was elected to the AAAS’s Section on Chemistry for his “pioneering contributions to the theoretical and

physical understanding of electron transfer and its application to artificial photosynthesis.” The MMRC is home to state-of-the-art instrumentation that facilitates cutting-edge interdisciplinary research in the fields of chemistry, surface science, and materials science. The center hosts myriad projects, including work on artificial photosynthesis.

“Bruce Brunschwig is a model for us to aspire to with his dedication to scholarship and his natural curiosity and inquisitiveness,” says Brunschwig’s colleague Nate Lewis, the George L. Argyros Professor of Chemistry at Caltech and the scientific director of the Joint Center for Artificial Photosynthesis. “His election as a fellow to the AAAS is well deserved.”

Caltech is currently home to 42 fellows of the AAAS.

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Caltech Y Column

CALTECH Y

The Caltech Y Column serves to inform students of upcoming events and volunteer opportunities. The list is compiled by Neera Shah from information given by the Caltech Y and its student leaders.

Founded by students in 1916, the Y was organized to provide extracurricular activities planned and implemented by students as an opportunity to learn leadership skills and discover themselves. The Y seeks to broaden students' worldviews, raise social, ethical, and cultural awareness through teamwork, community engagement, activism, and leadership. More information about the Caltech Y and its programs can be found at <https://caltechy.org>. The office is located at 505 S. Wilson Avenue.

Ongoing and past programs hosted by the Y:

- Alternative Spring Breaks: Costa Rica, New York, Yosemite, San Diego, San Francisco
- Make-A-Difference Day: Hillside Home for Children, LA County Arboretum and Botanic Garden, Children's Hospital Los Angeles (Coachart), Eaton Canyon, Lifeline for Pets

Upcoming Events:

1. Courage and Resistance Tour: Movie Screening & Discussion

Tuesday, January 27 | Movie Screening: 6:00 PM | Discussion: 7:30 PM | Beckman Institute Auditorium

14 Years Before Edward Snowden was even born a group of antiwar activists broke into an FBI office, stole all the documents, and turned them over to the press. The public learned of a vast FBI domestic spying operation conducted on thousands of unsuspecting Americans - including Martin Luther King Jr. The "Activist Burglars" were never found...until now.

The Caltech Y Social Activism Speaker Series and the ACLU of Southern California present the Courage and Resistance Tour with a screening of the award-winning documentary 1971 and panel discussions featuring:

Betty Medsger - the first journalist to go public with the stolen documents in the early 1970's and author of, *The Burglary: The Discovery of J. Edgar Hoover's Secret FBI* with Professor John Raines and Bonnie Raines - two of the burglars.

Evening programs are free and open to the public with no required RSVP as space allows. Made possible with funding from the Moore Hufstедler Fund. The views expressed are solely those of the presenters and do not necessarily reflect the opinion of the California Institute of Technology or the Caltech Y.

2. Caltech Y Winter Camping Trip to Anza Borrego

Friday, February 14th - Monday, February 16th (Presidents' Day) |

Anza Borrego State Park Cost: \$70 | Sign up starting Wed., January 21st at 1:30 PM at the Caltech Y (505 S. Wilson)

Have you ever wanted to visit a palm tree oasis in the desert? What about hike through canyons to a scenic waterfall? Get away from the city lights and marvel at the Milky Way galaxy in the dark night sky? If you answered yes to any or all of these questions, then the Caltech Y winter camping trip is for you! The Anza Borrego Desert is a unique park in Southern California, with a variety of wildlife rarely seen elsewhere, including bighorn sheep, roadrunners (It's a real bird, not just a cartoon character!), and desert jackrabbits. The geological and cultural history of the park is also noteworthy, with famous fossil beds from the Pliocene and Pleistocene Epochs and 2000 year old rock paintings. February is the ideal time to visit the park, with daytime temperatures averaging 75-80 degrees and little chance of rain.

Here are the details:

Where: Anza Borrego Desert State Park (About 125 miles Southeast of Pasadena)

When: February 14th-16th (Monday, February 16 is Presidents' Day and a Caltech holiday)

Cost: \$70, includes transportation, campsite reservations, most meals, and use of equipment from the Caltech Y

If you have any questions, email Dorothy Pan at dpan@caltech.edu or Jeremy Sandler at jsandler@caltech.edu.

3. Pasadena LEARNS

Friday | 3:00 - 5:00pm | Madison and Jackson Elementary School | Pasadena

Come volunteer at Madison and Jackson Elementary School! We are partnered with the Pasadena LEARNS program and work with their Science Olympiad team or do regular tutoring along with occasional hands-on science experiments. Transportation is provided. For more information and to RSVP contact: vkumar@caltech.edu.

4. Rise Tutoring Program

Monday - Thursday | 4:00 - 6:00 PM | Winnett, 2nd Floor

The Rise Program is an afterschool math and science-focused tutoring program that serves public school students between grades 8 and 12 who are struggling in math and science (receiving a C+ or below in either subject). The tutoring takes place on the Caltech campus Monday-Thursday from 4pm-6pm. Tutors are matched with 1-2 students and will ideally work with the same student for the whole year. Tutors commit to 1-2 days per week for at least 2 terms out of the year. Schedule changes can be accommodated throughout the year. This is a great way to volunteer without having to leave campus. For more information about the program and to apply please visit our website at: https://caltechy.org/programs_services/tutoring/Resources/index.php.

Students compete in final round of Perpoll Speaking Competition for scholarship

NEHALY SHAH
Editor-in-Chief

The final round of the Perpoll Speaking Competition was held on Jan. 22 in Beckman Institute Auditorium. Six finalists were chosen from over 250 students: Lilly Luo, Adam Jermyn, Gerri Roberts, Sean McKenna, Jiemin (Jenny) Sheng, and Benjamin Wang. The students competed for the first place prize of \$1000. After the students presented their respective SURF projects, the winner was determined. Benjamin Wang, senior, was awarded first place; Adam Jermyn, senior, and Sean McKenna, sophomore, tied for second place.

Wang worked on his project, "Discovering the enzymes that catalyze the reduction of phenazine-1-carboxylic acid (PCA) in *Pseudomonas aeruginosa*," in the lab of Dianne Newman, professor of biology and geobiology and under the mentorship of graduate student Nate Glasser.

Wang described the ideas of his project: "*Pseudomonas aeruginosa* is a Gram-negative opportunistic pathogen that causes infection in a variety of contexts including burn wounds and the lungs of persons with cystic fibrosis. These bacteria synthesize redox-active compounds called phenazines that not only serve as virulence factors but also directly enable the survival of the producing organism. Phenazines, such as phenazine-1-carboxylic acid (PCA), are often found in a reduced state when carrying out their functions. This project has identified multiple enzymes, including dihydrolipoamide dehydrogenase (DLDH) that can catalyze the reduction of PCA. X-ray crystallography was used to understand the mechanisms of this reduction on a structural

level. So far a three angstrom crystal structure of DLDH has been solved, although there is no obvious electron density for the phenazine at this stage."

The results of Wang's project have important medical implications. "As phenazines are important virulence factors for *P. aeruginosa*, understanding the reduction pathway of phenazines can provide a novel avenue for treatments against the pathogen during infection," Wang said.

Although Wang has presented on his research, his work is not finished yet. He is continuing this research throughout the year, and will present his senior thesis on these findings. He hopes "to get the final crystal structure of DLDH bound to PCA relatively soon."

Jermyn conducted research for his project, "External Stellar Heating," under E.S. (Sterl) Phinney, professor of theoretical astrophysics. "I looked into the ways in which pulsars can impact the atmospheres of nearby stars and the way that this can feed back on the pulsar. The former generally takes the form of heating through deep irradiation, while the latter is a question of accretion. As something like half of all millisecond pulsars have nearby companion stars, understanding the interactions between the two is important for our understanding of pulsars and their environment," Jermyn said. He started this project at the beginning of his junior year, and plans to continue it as his senior thesis.

McKenna performed research for his project, "Designing an Application to Allocate Polling Place Resources for Elections," under the direction of R.M. Alvarez, professor of political science. "The goal of my project was to create a program which uses Monte Carlo

simulations to estimate wait times in polling places on Election Day, then use the simulated data to propose an efficient allocation of resources such as voting booths," McKenna said.

McKenna's project has larger political implications: "We hope that, once this program has been tested sufficiently, it can be used by election administrators to combat the long election lines which impede the expression of democracy. I'll be continuing to adjust my program to better fit the data we collect as such data becomes available." His project also emphasizes the importance of honing the skill of oral presentation: "For a project like this, since the ramifications are so deeply political even though the intellectual crux is in mathematical modeling, presentation is critical. If I present this tool to lawyers or election administrators, which I'm sure would have to happen before it ever would be implemented, the ability to communicate the technical details of my work clearly would be necessary to get the implementation approved."

The Perpoll Speaking Competition and the SURF program highlight the necessity of excellent speaking skills even in research-heavy STEM fields. Jermyn agrees that speaking is "absolutely crucial. There are two reasons for this. The first is somewhat mundane: if you want to get funding for your ideas, you need to convince people that they are worth funding. The second, however, is that it is part of the job of a scientist to communicate their work: science not communicated is science not done. The level at which it is communicated (i.e., to the public versus to the scientific community) may vary based on context, but the fact that it is communicated is key."

News briefs from around the globe

Here's a brief list of events from the past week, compiled by The California Tech editors:

Ebola vaccines to begin testing in clinical trials

2 vaccines will start trials in Liberia in February, with support from the NIH [TIME]

Charlie Hebdo newspapers delivered to US

20k copies of the French satirical newspaper will be offered in NYC, SF, and LA [TIME]

Saudi Arabia witnesses relatively favorable transfer of power

79-yr. old Salman bin Abdulaziz assumed throne, has good relations with US [CNN]

Boko Haram releases some hostages, terrorizes others in Nigeria

192 women released, but at least 26 men still held near Girbhuwa village [CNN]

Measles outbreak spreads in California and eastern states

68 cases confirmed in California, 9 more reported in bordering states [CNN]

Protests against police in Egypt continue

16 dead in protest that broke out after an activist was killed in Cairo march [BBC]

Fights against pro-Russia rebels in Ukraine leave more dead

30 killed in most recent uprising in Mariupol, sparks move for calmer protests [BBC]

Why do smart individuals form stupid organizations?

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It's almost too easy to point out, but almost no one sets out to do evil.

On Dec. 9, 2014, the Committee Study of the Central Intelligence Agency's Detention and Interrogation Program, or CIA Torture Report, was finally released in summary. In comparison with the FBI abuses perpetrated during the 1960s and 1970s, it is illustrative to see how certain patterns are repeated in our own time. After Sept. 11, 2001, all 17 US intelligence agencies frantically worked to try to understand and prevent a future terrorist attack. Some of them (notably not the FBI in this instance) went so far as to employ torture, sometimes referred to euphemistically as Enhanced Interrogation Techniques, or EITs. Similarly, prisoners were referred to as detainees to avoid any confusion with the Geneva Convention. While the CIA was likely not the worst practitioner, it is the only agency thus far to be held to any kind of account and thus forms our case study.

In summary, the key findings of the report were

- The CIA's use of EITs was not an effective means of acquiring intelligence or gaining cooperation from prisoners, and justifications based on effectiveness were thus void.

- The interrogations and conditions of imprisonment were brutal and far worse than the CIA told policymakers responsible for oversight, and included rape and hypothermia.

- The CIA repeatedly lied to and obstructed the Department of Justice, congressional committees, the White House, and their own Office of Inspector General.

- The program hindered and harmed national security.

- The CIA leaked selected or false information to the media in support of the program.

- The CIA's management of the program was fundamentally flawed throughout its duration, including outsourcing, lacking internal accountability, improvising torture methods on the fly, and failing to keep track of who, why, and how many people were kept.

- The program was unsustainable, extremely costly, and significantly damaged the world standing of the US.

- The CIA marginalized and ignored numerous internal critiques, criticisms, and objections concerning the operation and management of the CIA's Detention and Interrogation Program.

None of these findings are particularly surprising. The inefficacy of torture at eliciting reliable information has been recognized since the beginning of

history. The science of effectively and ethically interrogating prisoners has been well understood in the West since at least the second world war. Even if torture worked it would still be unethical. There are plenty of examples of effective security techniques, such as universal pre-emptive imprisonment, that are nonetheless unethical and should be avoided, especially if you're fighting a war on moral or ethical grounds. Torture is illegal, and prosecution for it is mandatory under international law. Finally, torture and other acts that degrade the law of war endanger the US's own troops. As the most powerful country on Earth economically and militarily, the US has the most to lose if it seeks to normalize fighting dirty. This logic applies domestically as well, where the public's faith in government and law enforcement is the most powerful tool for law and order, a faith compromised by pointless and relatively rare actions by a handful of malefactors enabled by institutional incompetence.

Perhaps the most interesting conclusion of the torture report is the last one. The CIA, like any other agency, is staffed primarily by motivated experts who have a solid moral compass and the interests of the country at heart. Yet despite that, none of these majority stakeholders within

the CIA were able to prevent or confront the torture program. In a system where incompetence can be hidden through secrecy and classification, it becomes even harder to ensure just action.

Between Hoover's FBI, the CIA's catastrophic lapse, and the NSA's mass surveillance and deception of Congress, it is now clear that corruption stemming from secrecy and unaccountability is the norm, not the exception. This danger was recognized by the Founding Fathers when Jefferson wrote, "In questions of power, let no more be heard of confidence in man, but bind him down from mischief by the chains of the Constitution."

What can we learn from these examples? Organizations exist to tackle big, complex problems that can be solved no other way. They perform vital functions and must deal with constantly changing parameters in a tightly coupled system. The most important tool an organization possesses in dealing effectively with pre-existing and emergent challenges is internal communication.

Effective internal communication is the antidote to chaos at every level, from family dynamics to Caltech student leadership to ensuring ethical action within secretive organizations to state, national, and international law and politics.

Everyone on Earth participates in numerous organizations, and the actions of those organizations, mediated by communication, are the responsibility of their respective participants, whether that be speaking, listening, or relaying information.

Today, it seems unlikely that legislation will ever catch up with technological innovation. The political climate of the future is being determined in the present by the ideology of technology companies that connect people, conduct business, and solve particular problems. The prime example is the ongoing transition of political power from government to the big technology companies, for whom expertise in signals intelligence is the core business. Whereas domestic and foreign intelligence actions have been historically separated to safeguard freedom, today both effectively sit in the hands of private, non-democratically regulated multinational corporations. To whom, if not their own engineers, will these entities be accountable when their power is absolute?

The film 1971, telling the story of the FBI burglary, will be screened on Jan. 27 at 6 p.m. in Beckman Institute Auditorium, with a discussion with burglars John and Bonnie Raines, and journalist Betty Medsger, after the film.

Inclusivity is the solution to the injustice that transgender people face

HANNALORE GERLING-DUNSMORE
Contributing Writer

I last wrote about the issues facing the transgender community following the tragic suicide of Leelah Alcorn, a transgender teenage girl from Ohio. While the transgender community does face crushing discrimination with few legal protections, daily threats of violence, and ostracization from mainstream society, there are many steps we can take for transgender equality, both as individuals and as a larger community.

Perhaps most obviously, discrimination hate crimes against transgender people need to be wholly illegal. We need to push for laws protecting the employment of transgender people, making it illegal to fire them simply for being trans. Additionally, it needs to be illegal to deny a transgender person housing on the basis of being trans. "Trans panic" defenses need to be banned in all states, preventing the murderers of transgender people from arguing that discovering someone is trans is sufficient reason to kill them without legal consequences. Additionally, the police need to be less hostile toward transgender people. In particular, transgender women of color are disproportionately profiled as prostitutes and are harassed by police accordingly. Even when they are the victims of a crime, transgender people often face an unhelpful and unwilling police force

and serious risk of being "outed" as transgender, subsequently putting them at risk for more violence.

Unfortunately, violence from others is not the only threat transgender people face—transgender people are at a greatly higher risk for attempting or committing suicide. There needs to be more research done on how to properly provide mental health care for transgender individuals, and it needs to become part of the standard training for mental health professionals, so that transgender people can easily access the mental health support they need. Further, harmful practices like "conversion therapy" (which Alcorn was subjected to) need to be banned in all states. Insurance companies need to be required to provide coverage for the treatment of "gender dysphoria," the medical condition that gives rise to a transgender identity, as they would be required to cover treatments for other mental health issues. This can include hormonal therapies and sex reassignment surgeries, like genital reconstruction. Additionally, doctors need to have more access to research on the overall health care of transgender patients. For example, how much information is really available for a gynecologist seeing a transgender man? How does his taking testosterone change his risk for various health problems in his uterus, ovaries, and vagina? There has not been enough research done on the general care of transgender patients.

For all of the above-mentioned issues, rectifying legislature or policies can easily be drafted. We can—and should—be contacting our elected representatives to let them know that this is an important issue to the voting public, and that this is an issue worth paying mind to. The same can be done for LGBTQ organizations, and to businesses: let them know that transgender issues are important to you, and that they will be influencing your donating or buying decisions. Unfortunately, policies and laws will not fix all the issues facing the transgender community. Many of the problems transgender people face are societal. In general, it needs to be made vastly easier for transgender people to live out their lives as their true gender identity. For example, if not made illegal, it at least needs to become grounds for massive backlash for publications to publish the name given to a transgender person at birth without receiving explicit permission. In fact, it is highly arguable whether or not mentioning that someone is transgender should be done at all, if being trans is not relevant to the story being told. While visibility is important, transgender people should not have to live their lives with their gender identity being one of their defining traits.

On a related note, we need to stop actively privileging being cisgender. Many times, people will tell a transgender person, "Oh, I couldn't even tell you were trans!" as an attempted compliment.

Implicit in this statement, however, is the idea that it is best to "pass" as cisgender, that it is somehow negative to be overtly transgender because being transgender is somehow negative. Some transgender people want to have a voice, facial features, genitals, and other external gender markers that conform to the normative standard for their gender identity. However, some do not, and neither is a more or less "correct" way to be transgender. Gender is a personal expression, based on a person's neurological makeup and socialization, and is not an objective metric. Someone is not more or less of a man because he prefers to go by "Polly," the name given to him at birth, or because he chooses to not get his breasts removed; likewise, someone is not more or less of a woman because she doesn't feel the need to have breast implants or to have her penis removed and a vagina constructed. Further, some transgender people don't even identify as a "binary gender" (male or female), but instead as somewhere in between. This, again, is an entirely valid gender identity. It is not up to anyone to say that someone else's gender identity is invalid. Perhaps you might not understand a non-binary identity, but that is a matter of personal ignorance, not an objective reality.

In order to better include transgender identities, we can start inquiring about people's preferred pronouns during introductions. We can start creating more

gender neutral options in English grammar, and stop needlessly gendering objects. For example, there are hundreds of thousands of men in the US alone who use menstrual products, especially in the early stages of their transitions. There is no practical use in calling sanitary pads and tampons "feminine products," other than to avoid explicitly stating their connection to menstruation. However, perhaps most important is creating more gender neutral spaces. A classic example is bathrooms. There are few reasons to have gendered bathrooms; perhaps there is concern that the sight of a penis at a urinal might be upsetting to cisgender women, but it seems easy enough to erect a partial wall separating off the urinal area. Concerns about heightened risk of sexual assault in a bathroom are proven absurd when you consider that absolutely nothing is keeping a predator from hiding in a women's bathroom, waiting for a chance to strike. Gender neutral bathrooms prevent binary transgender people from being misgendered and shamed for using a bathroom that aligns with their identity, and gives a good option for non-binary people. Besides, I cannot be the only woman who is tired of standing in a long line for the women's bathroom while the men's bathroom has no wait.

Of course, all of these measures will take considerable effort

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Tommy Caldwell, Kevin Jorgeson free climb Dawn Wall

CASEY HANDMER
Contributing Writer

On Jan. 15 Tommy Caldwell, 36, and Kevin Jorgeson, 30, managed to complete their groundbreaking Dawn Wall project, begun by Caldwell in 2007 with Jorgeson joining in 2009. Both climbers routinely spent weeks to months each year encamped in tiny hammock-tents thousands of feet off the ground as they worked on mastering the project.

Like every other slab of stone in Yosemite Valley, El Capitan has been climbed by more than 100 distinct routes, most involving the use of “aid,” mechanical systems to help the climber. Purists within the sport prefer to climb “free,” that is, with hands and feet and ropes only to catch the climber in case of a fall, at which point they generally begin again from the bottom of that section.

Like every other big wall climb, the Dawn Wall is broken up into multiple sections (32 in this case) or “pitches” approximately as long as the 200-foot rope the climbers use to belay each other. What sets the Dawn Wall apart is the extreme technical difficulty of the climb. The central six (out of 32) pitches are the hardest—each individually as tough as the hardest walls you would find in any gym, and all thousands of feet from the ground. Over New Year’s, Jorgeson struggled for a week with pitch 15, tearing skin from his fingertips during a traverse rated 5.14d in difficulty, so hard that perhaps only

a few dozen climbers in the world could ever repeat it.

When a crucial hand hold snapped in 2012, pitch 16 went from difficult to impossible, their nearly 3000-foot route up the slab stymied in the middle by eight feet of blank rock with nothing to stand on. Caldwell and Jorgeson realized the only solution would be to jump, the handholds on either side no bigger than a door frame and made of razor sharp granite.

While it is one of the hardest, if not the most difficult, climbs ever completed, the Dawn Wall is more of a beginning than an end. Previous generations of climbers celebrated the free climbing of El Capitan by the least challenging (and then the only possible) routes. Today, top climbers often spend years developing routes that are deliberately challenging, keeping with an emerging aesthetic that favors bold, audacious lines.

On the completion of this nearly decade-long project, Jorgeson said, “This is not an effort to ‘conquer.’ It’s about realizing a dream. I hope it inspires people to climb their own Dawn Wall.” Looking forward to a shower and walking on flat ground after 19 days, Caldwell remarked, “I would love for this to open people’s eyes to what an amazing sport this is. I think the larger audience’s conception is that we’re thrill-seekers out there for an adrenaline rush. We really aren’t at all. It’s about spending our lives in these beautiful places and forming these incredible bonds.”



-<http://nytimes.com>



-<http://koin.com>



-<http://cnn.com>

Societal changes necessary to prevent marginalization

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and thought from any adult in our society, as we are so heavily socialized to view gender as inherent and immutable. To truly enact change, we need to raise a new generation with a more open view toward gender. Rather than forcing children to confirm to gender stereotypes before they’re even born, we need to let children explore what their gender means to them with less pressure and more acceptance. We need to let children know that while having a vagina means they are likely to identify as girls, they still might identify as a boy after all, or neither a boy nor a girl. Additionally, if children are transgender, we need to start supporting their identities. As Dr. Johanna Olsen stated (in a well-known Dateline interview) in response to questioning whether or not it’s “ridiculous” to let preteens decide if they want to start hormonal therapy, “Well, they’d make the decision to kill themselves at 12 and 13.” If you want to gain a more insight to raising a child in a less cisgender-centric way, I highly recommend the webcomic, “Assigned Male,” about a young transgender girl, her friends—some cisgender,

some transgender—and her family navigating her childhood.

Making these changes might seem like a daunting task, and for a good reason—it truly is. In order to make a society equal for cisgender and transgender people, it requires us to rewrite our narratives for gender, and to let go of concrete definitions and make space for abstract understanding. The good news is, though, that you don’t have to make all these changes at once. Start with further educating yourself on transgender issues (Google will serve you well!) and trying to notice ways in which day-to-day life is easier if you are cisgender. Then, maybe ask someone what pronouns they prefer if their gender identity is ambiguous. Petition for gender neutral restrooms. Tell elected officials that you care about the equality of transgender people. Donate to organizations that serve the transgender community, and don’t give money to companies that discriminate against transgender people. The world is changed incrementally, and we all can make small changes—and perhaps later on, big changes—to how we move through the world to help others feel safer, more accepted, and, eventually, equal.

Gregory Harlow, a second-year graduate student in CCE, passed away last Thursday afternoon.

The California Tech would like to join President Rosenbaum in sending condolences to Harlow’s family and all those affected.

Also, please keep in mind the numerous resources available for all members of the Caltech community: students can call the Deans’ offices, Community Associates, RAs, RLCs, Health Advocates, UCCs, and the Center for Diversity. The Caltech Counseling Center is open during weekdays and will have extended drop-in hours with no appointment necessary. For more information call x8331 or go to the Counseling Center website.

Faculty, staff, and postdocs are encouraged to contact the Staff & Faculty Consultation Center at x8360.

Men's team plays hearts out, Eslinger is "darn proud"

GOCALTECH.COM
Actual Sports Content Editor

LA VERNE, Calif. (Jan. 24, 2015) – Sophomore Nasser Al-Rayes (Doha, Qatar / American School of Doha) recorded his third double-double and paired with junior Kc Emezie (Waxhaw, N.C. / Marvin Ridge) to carry the Caltech men's basketball team in a double-overtime defeat at the University of La Verne on Saturday evening.

"I can't say enough about this group coming together the last couple of weeks," Head Coach Dr. Oliver Eslinger said. "It's really a sight to see and all of Caltech should be proud of what this team is doing. Thanks to all the students for coming out to the game, they helped us tremendously and boosted our energy – they're awesome!"

The Beavers held leads late in regulation and to open both overtime periods, but the Leopards rallied thrice to defend their home court. La Verne improves to 6-10 overall and 2-6 in the SCIAC, while Caltech drops to 1-15 (0-7) on the season, which now includes four overtime games and six extra periods in total.

Caltech nearly overcame a dismal 29-percent shooting from the field and 11-percent mark from long range as the defense held La Verne to just 33 and 19 percent, respectively. The Beavers committed a season-low 12 turnovers across the 50 minutes of play, but the Leopards posted a 15-6 edge in scoring off turnovers and 8-0 mark on the fast break to help make up their six-rebound deficit (49-43).

"We played a terrific game and made it come down to making plays and shots – that's the sign of a good team," Eslinger said. "We did a good job getting into our offensive sets and putting the ball in good hands for the scenarios. We defended our tails off, won the boards again, and had single-digit turnovers in regulation. We didn't shoot well from the field, but we converted free throws, especially when we needed to late, hitting all of them in the second half and overtime."

The scoring opened with a three-pointer on either side before a 14-3 run sent La Verne well ahead at 17-6 with 6:57 on the clock as Caltech went over eight minutes without a basket. Freshman David Kawashima

(Studio City, Calif. / North Hollywood) and sophomore David LeBaron (San Diego, Calif. / Francis Parker) spearheaded a late flurry to pull the Beavers back within seven at the break, 22-15, as the pair combined to score the final seven points of the half.

The Leopards held their margin over the first two minutes, but the Beavers rattled off an 8-2 run to pull within one at 28-27 with just over five minutes elapsed. Al-Rayes started to heat up at that point, hitting a hook shot in the post to send Caltech ahead for the first time at 29-28 with 13:55 on the clock. The big man put his team back up three more times, the last at 38-36 with 8:04 remaining, which senior Andrew Hogue (Arroyo Grande, Calif. / Arroyo Grande) added to with a layup for the Beavers' biggest lead of the game at four points.

"We did a much better job executing our game plan to end the half and start the second," Eslinger said. "We really tried to refocus the team on our main game goals, and the guys did a wonderful job listening and processing everything."

DK really showed his stuff and gave us a huge boost when we were struggling to score, manufacturing points and making a run."

La Verne immediately regained the lead with five straight points, but a jumper by senior Bryan Joel (Bethesda, Md. / Walt Whitman) put Caltech back on top with 3:16 to go. Hogue got to the line and made it a three-point game with two minutes to play, but two trips to the charity stripe allowed the Leopards to tie things up at 44-44. With the ball in their hands for the final possession, the Beavers could not get a clean look despite a pair of offensive rebounds, and the game went to overtime.

"When it went to overtime again, we just said, 'Let's enjoy playing some more basketball!'" Eslinger said. "I actually enjoy them – they're exciting to coach. To see us battle the whole way, and the couple extra, says a lot about our program."

Having already played four overtime periods this season, it was no surprise that Caltech scored the first four points in the opening minute. La Verne tied things up less than two minutes later and went ahead on a pair of free throws at the 1:43 mark, but Emezie tied it with a pair of free throws and did it again after a La Verne basket going into the final minute. Caltech's defense did its job at the other end but as Joel grabbed the rebound, he fell to the floor and was whistled for traveling, giving the hosts another chance. La Verne's final effort missed everything, however, to send the game to double overtime.

Emezie kept up his late dominance with a three-point play to open the second overtime, but the lead would not last as La Verne's Brett Stephan nailed a three with a hand directly in his face to level the score at 55-55. Emezie came right back, driving into the lane and drawing a foul to earn another trip to the line, where he calmly converted both free throws to regain the lead with just 1:25 remaining.

Once again, the defense took care of business on the other end, but as Hogue turned upcourt after a rebound, La Verne stripped the ball and called a timeout. Stephan hit a jumper following the inbounds with 53 seconds left to play and, following a block on the defensive end, the Leopards scored the go-ahead basket on a tip-in with just three seconds remaining. Hogue's last-gasp three-pointer looked true but clanked off the back iron to end the game, 59-57 in La Verne's favor.

Al-Rayes and Emezie led the Beavers with game-highs of 14 points apiece as Al-Rayes completed the double-double with 10 rebounds. Hogue brought down a game-high 14 rebounds and sophomore Ricky Galliani (Menlo Park, Calif. / Sacred Heart Prep) chipped in nine points.

"Hogue and Kc led everyone in playing their hearts out, grinding and gutting out plays all night," Eslinger said. "Kc got that look in his eyes that he wasn't going to be stopped and was spectacular. Nasser played big, and Lawrence Lee had some great minutes. I'm just darn proud of these guys."



KC Emezie plays his heart out and captures mine.

-<http://gocaltech.com>

Lewis gets sixth double-double of season, still hungry for victory

GOCALTECH.COM
Actual Sports Content Editor

LA VERNE, Calif. (Jan. 24, 2015) – Sophomore Kate Lewis (San Antonio, Texas / Ronald Reagan) recorded her SCIAC-leading sixth double-double of the season and junior Stephanie Wong (Palos Verdes Estates, Calif. / Palos Verdes Peninsula) poured in an efficient 16 points to pace the Caltech women's basketball team at the University of La Verne on Saturday afternoon.

The Beavers outshot their opponents, 47-39 percent from the field, and came away with a positive rebound margin for the first time this season at +10, but the Leopards created 13 more shots and hit five additional three-pointers while committing 13 fewer turnovers. La Verne improves to 8-9 overall and 5-3 in the SCIAC, while Caltech is now 0-18 (0-9).

"It was a great game from start to finish, we were in it the whole way," Head Coach Sandra Marbut said. "We knew we had better after a disappointing result at Oxy, and today we came out and showed that. Our pregame quote, attributed to FDR, was 'It is not sufficient to just want. You must ask yourself what you are going to do to get the things you want,' and we made the game we wanted happen. We played as a unit, rebounded

and shot well and just missed the mark on turnovers, which made the difference."

La Verne opened up the scoring with the first five points, but Caltech fought back to take the lead at 16-14 with 10:02 on the clock behind a quick eight points from Lewis. The Leopards turned the tables, however, posting an 11-2 run to head into halftime up 25-18.

Lewis and Wong combined for the Beavers' first 10 points in the second half and senior Bridget Connor (Albuquerque, N.M. / Albuquerque Acad.) capped the run with a jumper to cut the margin to four at 34-30 with 14:38 to go. Caltech hung within singles digits for the next seven minutes until back-to-back three-pointers sent ULV ahead by 11 at 46-35, but Wong matched the feat herself on the Beavers' next two possessions to trim the margin back to five points at 46-41 with 5:47 on the clock. Caltech would not come any closer, though, as both teams traded baskets down to the final 55-47 score line.

"Kate and Kristin were a fantastic duo," Marbut said. "They had some great combined moments where they played off each other so well, it was like they were the same person in two places. It was a beautiful and coordinated high-low game. Kristin especially had some critical offensive boards that gave us a great energy boost and truly kept us in the game. Stephanie got off to a

rocky start, but we have been talking about leaving mistakes in the past and focusing on how to move forward. She finally got to that point when she hit those back-to-back threes in the second half – that just ignited our energy."

Lewis scored 15 points, grabbed 11 rebounds and added three assists while Wong scored her 16 points on 7-of-11 shooting, including 2-of-4 beyond the arc, and pulled down six rebounds. Junior Kristin Anderson (Folsom, Calif. / St. Francis) chipped in eight

points (3-of-6) and eight rebounds in just 22 minutes off the bench, with Connor matching Lewis with three assists.

"We know that having only nine players, just eight which played tonight, means everyone has to contribute," Marbut said. "It can make you feel vulnerable or it can be a tremendous strength, because everyone knows their team needs them – everyone matters. We chose to make it a strength today, and just missed getting the win."



Maybe she's born with it ... or maybe it's just that ball is life.

-<http://gocaltech.com>

ASCIT Minutes

ASCIT Board of Directors Meeting

Minutes for 23 January 2015. Taken by Sean McKenna.

Officers Present: Cat Jamshidi, Patrick Nikong, Annie Chen, Sean McKenna

Guests: Margaret Lee

Call to Order: 7:05

President's Report (Cat):

- Library staff have been meeting with Cat, Connor, and Nima, and the discussion about hours led to the agreement stated in Nima's email.
- MHF committee met today to consider second term funding proposals.
- ASCIT would like to remind everyone of the support offered by the UCC's and Caltech Safety Net in light of the recent tragedy.

Officer's Reports:

- **V.P. of Academic Affairs (ARC Chair: Nima):**
 - Absent
- **V.P. of Non-Academic Affairs (IHC Chair: Connor):**
 - Absent
- **Director of Operations (Connie):**
 - Absent
- **Treasurer (Patrick):**
 - OASIS Sangam, EWB Benefit Dinner applied for event funding, Entrepreneurship Club applied for club funding.
- **Social Director (Annie):**
 - ASCIT Formal is happening on Saturday, April 4th.
 - Interhouses are coming up soon, beginning with Ricketts on February 14th.
 - Annie is still working on the Magic Mountain trip for March 7th.
- **Secretary (Sean):**
 - Ordered MHF-approved projector/screen/sound system

If anyone has any questions or concerns about a section of the minutes please email the appropriate officer. We are happy to answer any questions. The next meeting will take place on **January 30th** at **8pm** in **SAC 15.**

Meeting Adjourned: 7:25

YOU ARE NEVER ALONE.

REMINDER FROM
THE COUNSELING CENTER:

Meditation Mob
(drop-in mindfulness
meditation group)

meets every Tuesday
Bottom floor of Winnett
from 12:00-12:50 pm

Caltech Jazz Band Announces Performance

The Caltech Jazz Band, directed by Barb Catlin, presents its Guest Artist Concert on Saturday, January 31st at 8:00 pm in Beckman Auditorium.

Featured guest artist is Los Angeles native, Pete Christlieb, who is regarded as one of the true living legends of the tenor saxophone. His identifiable sound has been featured on iconic recordings from Natalie Cole's "Unforgettable" and Steely Dan's "Deacon Blues," to his years with Doc Severinson's Band on The Tonight Show with Johnny Carson.

Admission is \$10 for the general public and \$5 for Caltech staff, students and faculty.

For more information, please visit bands.caltech.edu or call (626) 395-3295.

CALTECH THEATER offers several chances to branch out and take chances, have fun and expand your social network this year!

WANTED: Actors, singers, musicians, technical personnel, and designers for new, original Caltech musical *Alice Through the Wormhole!* This musical is currently in the development phase with a world premiere run February 20-March 1, 2015!

If you are interested in any facet of production, including script development, contact Brian Brophy directly (brophy@caltech.edu).

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Contact: Adam Jacobo

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ajacobo@caltech.edu

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Letters and submissions are welcome; e-mail submissions to tech@caltech.edu as plain-text attachments, including the author's name, by Friday of the week before publication. *The Tech* does accept anonymous contributions under special circumstances. The editors reserve the right to edit and abridge all submissions for any reason. All written work remains property of its author.

The advertising deadline is 5 PM Friday; all advertising should be submitted electronically or as camera-ready art, but *The Tech* can also do simple typesetting and arrangement. All advertising inquiries should be directed to the business manager at tech@caltech.edu. For subscription information, please send mail to "Subscriptions."

Brad/Chad Business Tutorial: Isn't marketing just making cool ads?

BRAD CHATTERGOON
Contributing Writer

Hey guys and girls. As it turns out, the plague is real. It seems that half of the Caltech student body is sick, myself included, and let me tell you, it's been a real damper on the usual "get things done" approach to life. Despite the sniffles I made it to the SanPietro presentation this past Friday and heard from Page juniors Alex Pien and Jean Turban who took a trip to Cambodia this past summer! Sounds like it was pretty wild, involving leeches, being stuck on a rock in the middle of a rising river, and even transportation in a van next to two chickens. Get them to tell you the story if you missed it. Somewhat relatedly, anyone else want to apply for the SanPietro to go to Japan?

This week's article will focus on an introduction to the basics of marketing. It is important to note that marketing is not the same as advertising; advertising is only a subset of marketing operations. The best way to introduce marketing would be to talk about what is termed "the four P's." However, there has been a redefinition of what the four P's are. The original terminology referred to Product, Price, Promotion, and Place. The new P's are People, Processes, Performance, and Profit. The old four P's are relevant to the consumer side of marketing while the new four P's are relevant to the firm side of marketing. I am electing to discuss the consumer side in this article.

Product: This is fairly self-explanatory. The product is the core of value creation and is devised to solve a consumer problem or address a consumer want. Products have a life cycle which goes through, growth, maturity, and eventually decline as the product is replaced or demand falls. Marketers need to know how to position the product, how to brand it, and how the product relates to other products that may serve adjacent or complementary functions.

Price: Marketers need to determine what the appropriate price for a product is. This can tie

into price discrimination, which I will talk about later. For instance, when positioning a product as a "Student Edition," it is likely that the pricing will have a lower price than one intended for general consumption. The marketer also needs to ensure that the pricing remains profitable for the firm. Pricing strategies can even affect how much perceived value is in a product and can make it more attractive to certain market segments. An example of this is readily available in clothing brands. Positioning a brand as "luxury" or "premium" with an accompanying high price tag can often capture profitable market segments without changing the product.

Promotion: How do we encourage consumers to buy our products? How do we let them know that it exists? These are the questions answered by promotion strategies. Showing movie trailers at the beginning of movies may seem obvious but it was probably a marketer who first came up with the idea to address the problem of targeting the market of moviegoers with their products. Promotion also ties into pricing strategies when one thinks about an "early bird discount" for someone willing to be a first buyer of the product, or of sending samples to persons with social clout that can endorse the product.

Place: Place really means distribution but it's called the four P's not the three P's and a D ... that could easily be misinterpreted. How do we get our product to our consumers? Do we set up a booth outside Walmart and sell to people there? Perhaps a showroom Tesla-style? These are issues that need an answer. Marketers come up with appropriate distribution channels, sometimes even innovative ones like the Apple Store.

That should give you something to think about when you look at a product. Wouldn't it be nice if we had a marketing class at Caltech? If you agree, be sure to fill the BEMSFC Survey when I send it out this week.

- Brad/Chad



-http://commons.wikimedia.org

Crossword

1	2	3	4	5	6	7	8	9	10	11	12		
13						14			15				
16						17			18				
19					20		21	22					
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40					41			42		43			
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48					49		50		51		52		
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57	58	59	60				61				62	63	64
65						66	67			68			
69						70				71			
72						73				74			

-puzzlechoice.com

Across

- 1. Under-water breathing device
- 6. Domesticated animal companion
- 9. Unexpected slide
- 13. Ravine
- 14. In the past
- 15. Blank area
- 16. Relating to birds
- 17. Swindle
- 18. Claw
- 19. Pull back
- 21. Item of clothing
- 23. Father
- 24. Name of the plantation in Gone with the Wind
- 25. Astern
- 28. Molten volcanic rock
- 30. Homopterous insect
- 35. Snare
- 37. Saucy
- 39. Bulbous herb with single showy flower
- 40. A slow pace of running

Down

- 41. Religious doctrine
- 43. Cleansing agent
- 44. Herbaceous plant with aromatic seeds
- 46. Annoy
- 47. Basic knitting stitch
- 48. Potent
- 50. Spline
- 52. Staining substance
- 53. Strong sweeping cut
- 55. Weep
- 57. Flower merchant
- 61. Legislator
- 65. Woven fabric
- 66. Simian
- 68. Gauntlet
- 69. Entertain
- 70. Pitch
- 71. Common
- 72. Persistently annoying person
- 73. Female sheep
- 74. Ahead of time

Down

- 1. Evidence of previous injury
- 2. Grotto
- 3. A single undivided whole
- 4. Supervisory committee
- 5. Toughen steel or glass by gradually heating and cooling
- 6. Treaty
- 7. Self
- 8. Polynesian country
- 9. Junk e-mail
- 10. Coarse curly-leafed cabbage
- 11. Symbol
- 12. Depression in a surface
- 15. Narrow sea channel
- 20. Adjust or conform
- 22. Part of a circle
- 24. Sully
- 25. Book of maps
- 26. Anterior
- 27. Perissodactyl mammal
- 29. Swerve

- 31. Point formed by two intersecting arcs
- 32. With relatively high volume
- 33. Personal journal
- 34. Fruit, malus pumila
- 36. Currency of Cuba
- 38. Relate
- 42. Taunt
- 45. Motor
- 49. Fuel
- 51. Part of a shoe below the laces
- 54. Condition
- 56. Lightweight wood
- 57. Excited state of agitation
- 58. Acidic fruit
- 59. Burden
- 60. Remainder
- 61. Scorch
- 62. Enlistment term
- 63. Elliptical
- 64. Depend
- 67. Foot of an animal

Sudoku

					2	1		
8			4	6		7		
6			1		9		8	3
					5		4	6
	5		9		8		1	
7	1		6					
5	8		2		1			4
		4		5	7			2
		9	3					

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Acquired Taste

Dr. Z



"Perks of Being in Academia"

Georgio Kraggman



Answers to previous crossword

S	M	A	L	L		E	L	A	N		A	R	I	D
P	I	X	I	E		B	O	L	E		P	O	S	E
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A	R	M	O	R	I	A	L		E	R	A			
R	A	I	N		A	K	I	N		T	R	I	A	D
I	N	N			L	I	V	E	R			D	U	O
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S	O	L	D		T	O	N	E		C	L	O	S	E
T	R	E	E		O	P	E	N		L	I	S	L	E
A	N	E	W		R	E	E	D		E	S	T	E	R

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