

PRINCIPIA PURPOSE

SUMMER '11

WOMEN IN LEADERSHIP

Also in this issue:

Speaking Up

Behind the Scenes of Math
and Science at the College

VOLUNTEER

"This is one way I can show my gratitude for all Principia did for me."

- Bert Bear (US'49, C'53)

"I volunteer for the Prin Club because it's a resource I like to have. Plus, it's fun!"

- Kerry Flatley (US'93, C'97)

Meet The Principia Club Board of Greater Boston

The Principia Club of Boston partners with local organizations in the area, including DiscoveryBound, Longyear Museum, Chestnut Hill Benevolent Association, and Project Bread.

GOING TO THE BOSTON AREA?

Check out their events, including a summer full of intramural sports each week!

Visit www.principia.edu/princlubs to find upcoming events in Boston or at a local Principia Club near you.

"I love connecting with local alums and friends of Principia."

- Chelsea Kendrick (C'10)

"It's so special to help foster the Principia environment where I'm living now."

- Jen Buchanan Silver (C'06)

"It's awesome to give people who never went to Principia a taste of the solid qualities that make up the Principia experience."

- David Bates (C'07)

HOW WOULD YOU LIKE TO BE INVOLVED?

Volunteering as a career contact, Reunion Committee member, externship sponsor, or Principia Club board member are just a few of the ways to get involved.

Visit www.principiaalumni.org/volunteer to get started!

To join your local Principia Club, go to www.principia.edu/princlubs.



The PRINCIPIA PURPOSE

SUMMER 2011, Issue No. 364

The mission of the *Principia Purpose* is to build community among alumni and friends by sharing news, updates, accomplishments, and insights related to Principia, its alumni, and former faculty and staff. The *Principia Purpose* is published twice a year.

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From the Chief Executive



Dear Readers,

"The world best knows Principia through those who are known as Principians." Founder Mary Kimball Morgan shared this idea in a talk to the graduating classes of 1935. It's still true today.

A tree is, indeed, known by its fruit. And Principia's harvests have been abundant for more than a century! Our graduates are making valuable contributions across the globe.

You can read about some of the many remarkable Principians in these pages. This issue's cover story focuses on women alumni who have achieved leadership positions in the fields of law, science, engineering, management consulting, and journalism. You will also find profiles of six members of the Class of 2011, three from the School and three from the College.

Mrs. Morgan intended Principia to be a school for both boys and girls. When Principia's policies were developed, Policy 14 took an unequivocal position that Principia "shall be a coeducational institution in the fullest meaning of the term."

The policy goes on to state that everyone at Principia will be eligible for responsibilities and opportunities regardless of sex. In the 1940s, when the policies were written, gender discrimination was common, so this was a strong stand for the principle of equal opportunity regardless of gender.

Mrs. Morgan was very clear on the spiritual basis for equality between the sexes: "We should let Principle form our basis for decisions, and there is not one Principle for women and another for men" (*Education at The Principia*, p. 115). It's invigorating to serve an institution with this value as a cornerstone.

As you dive into the magazine, you'll read about experiential learning in math and science at the College. You will find out how public speaking skills are fostered at all levels of the School and how attention to character unfoldment characterizes the Principia experience. As you'll see, all of this takes place within the context of recognizing the unlimited potential of *all* our students.

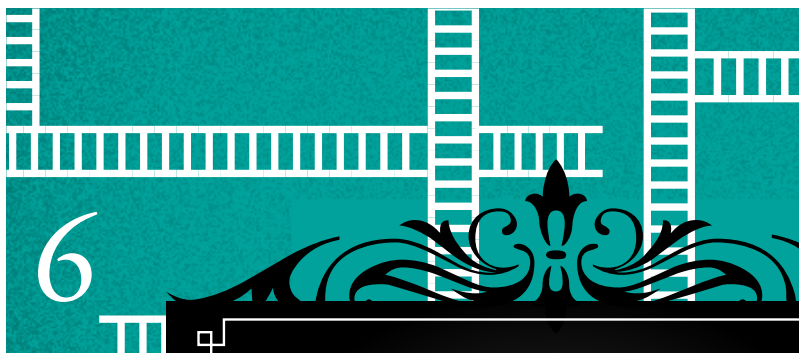
At Principia, we embrace limitlessness on a daily basis. Thank you for supporting this work!

A handwritten signature in blue ink that reads "Jonathan W. Palmer".

Jonathan W. Palmer
Chief Executive

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Enjoyed reading the recent [Winter '10] issue of *Purpose* and the articles on the digital files/books at the library. Have two questions:

1. The books in the library, did you buy them or digitize books you already had? If yes, who or how did you do this?
2. Will any e-reader work? Does Prin have a preferred or standard e-reader?

Thanks in advance for your responses.

Robert Reiner

Response from Carol Stookey, Director of the College library

College library patrons (current faculty, staff, and students) access, or "borrow," e-books instead of purchasing them. The collections of e-books the library owns or subscribes to are not designed to be "downloadable." Instead, patrons access material through the College webpage, which verifies (through ID numbers and passwords) that the user has permission to access the College's digital collection. Patrons use their computer to access these e-books from anywhere in the world with an Internet connection. The library does not use e-readers because those currently on the market for individuals are geared toward downloading (or purchasing) materials and reading the material offline.

The library has not done any in-house digitizing of its collections. Digitization of some key Principia publications, specifically The Sheaf and The Blade, are in process with an outside vendor.

To date, the library has not purchased e-readers for the reasons mentioned above. If, however, a patron has an iPad or an

e-reader with full Internet access, he or she can log on to the College Web page and access the digital collection in the same way computer users do.

On page seven of the [cover story by Ron Charles in the] Winter '10 *Purpose*, the statement is made that most of the publisher's costs are fixed and unrelated to paper or shipping. Very hard to believe!

There is no storage of paper in a digital system, so no cost of warehousing for paper, cardboard, and binding materials. No printing presses and ink, and personnel and space for above. I know presses cost well up in the hundreds of thousands. No assembly costs to manufacture books. No storage costs for printed books. No shipping costs for the books. In fact, what are the remaining costs? Only two items: editors to read incoming manuscripts, and order clerks to send out the digitized books. Must be a fraction of the former space, equipment, and personnel requirements. What am I missing?

G. Trefor Thomas (US'46)

Response from Ron Charles

It's true that when "books" go directly from the author's computer to a reader, they cost essentially nothing to produce. But for the most part, nobody wants to read those books! (Seth Godin is the only exception I can think of, though some romance authors are starting to deliver e-books directly to their readers, too.)

Most people still want books that have been purchased from an author, then edited

and marketed, and those are the significant "costs" of producing a book. Whether it finally gets printed on paper or zipped through the Internet is (almost) financially irrelevant.

Good e-books are created by real publishers (and their editors and marketers) who have real expenses that have little to do with paper and shipping. It's certainly true that it costs less to produce and distribute an e-book than a hard copy one, but the production/distribution phase of publishing is a small fraction of the overall process, small in terms of both time and cost.

A comment confirming the sentiments shared in "At Home in Howard House" in the Winter '10 issue.

I've had many homes in my life—places of growth and family and lessons learned—and Howard House is certainly one of them. The grandeur of the architectural space, the freshman mentoring by upperclassmen, the good humor or chiding of friends when you did something thoughtless, it helped us begin discovering who we are. (And I'm still working on that!) Not a week goes by that I don't recall something of my days and friendships at Prin and feel grateful for those blessings.

Peggy (Goodrich, C'77) Moretti



The Upper School varsity girls' basketball team celebrates a successful season.

Strong Seasons in Several Sports

For the first time in Principia history, the varsity girls' basketball team won sectionals, defeating the 2009 state champs and 2010 runner-up—Cardinal Ritter High School—with a score of 43–40! In addition, Liz Gilman (US'12) and Kara Johnson (US'12) were named to the All-District Team.

Several members of the girls' swim team earned spots on Metro Women's Athletic Association (MWAA) All-Star teams:

1st Team for the 50 Freestyle—
Dani McKenzie (US'12)
2nd Team for the 100 Butterfly—
Dani McKenzie
Honorable Mention for the
500 Freestyle—
Moriah Early-Manchester (US'12)

Dani McKenzie also qualified for state, competing in the 50 Free and 100 Fly. Though she didn't wind up qualifying for the finals, she beat her season best in the 50 and improved on her MWAA finals time in the 100.

The wrestling team had an outstanding season, sending eight qualifiers to the Missouri State Tournament and bringing home two of the top three awards—a third place finish for Jake Roometua and a first place finish for his brother, Josh Roometua, who was an Upper School student at the time. Other notable state rankings include Remington Lutz (US'12), who finished in the Top 8, and Garrett Moulton (US'12) and Ben Stolfi (US'12), who were Top 12 finishers.

Cum Laude Honors

(The Purpose went to print prior to this activity.)

On June 4, nine Upper School students will graduate with cum laude honors. All of them have maintained an exceptionally high academic level of achievement and an excellent citizenship record during their junior and senior years. Here are the names of this year's honorees:

Carrie Elizabeth Blanton
Cameron Scott Douglas
Ross Alan Furbush
James Christopher Jarvis
Christian David Thomas
Gavin Kenneth Thomas
Garrett Deland Wells
Holly Morgan Wilder
Jessica Rae Wingert



Dani McKenzie

Music Festival a Success

Last February Principia School hosted the 30th annual ABC Solo and Ensemble Music Festival with more than 350 6th–12th grade contestants from ABC League schools. Principians brought home a number of awards, listed below:

Upper School ABC League Ensemble Trophy Winners

Clarinet Ensemble—Bethy Diakabana (US'13), Stephen Hanlin (US'13), Summer Switzer (US'11)

Vocal Ensemble—Stephen Hanlin, Gabe Stringer (US'13), Aaron Switzer (US'12)

Outstanding Soloist Awards

Sarah Bell (US'12), viola
Melissa Frank (US'14), flute
Amanda Fulton (US'11), flute
Meredith Hamilton (US'13), vocal
Stephen Hanlin, vocal

Middle School ABC League Ensemble Trophy Winners

Woodwind Ensemble—Cecily Hibbs, Jennifer Ritter, Amanda Roberts

Outstanding Soloist Awards

Jennifer Ritter, oboe
Lily Oyer, vocal

In March, 34 upper schoolers competed at the District Solo & Ensemble Festival. Finally in April, the following 14 students, all of whom received superior ratings at the district competition, went on to the State Music Festival (those with an * also received a superior rating at state): Jessica Alford (US'12), Sarah Bell*, Bethy Diakabana, Melissa Frank, Annika Fredrikson (US'12), Amanda Fulton*, Meredith Hamilton, Stephen Hanlin, Dani McKenzie*, Hayley Scheck* (US'12), Kim Sheasley*, Gabe Stringer, Aaron Switzer.

Commencement

(The Purpose went to print prior to this activity.)

On June 5, Torkel Patterson will bring a global perspective to commencement as the College's featured speaker.

A graduate of the United States Naval Academy, he served under three administrations in a variety of government posts, including Special Assistant to the President for Asia, Deputy Assistant Secretary of State for South Asia, and Senior Country Director for Japan in the Office of the Secretary of Defense.

Patterson also worked at Raytheon Company for several years, focusing on international business development and serving for part of that time as president of Raytheon International Inc. He is currently president of U.S.–Japan MAGLEV, LLC, a U.S. company partnering with Central Japan Railway Company to market and deploy the world's fastest train and its environmentally friendly technology to international markets, including the U.S.

College Debuts Musical Version of a Dickens Tale

In May the Theatre and Dance Department presented the first-ever collegiate production of Jill Santoriello's *A Tale of Two Cities: The Musical*.

Set just before and during the French Revolution, the story traverses the depths and heights of human nature, uncovering loyalty, treachery, forgiveness, and sacrifice in its course.

Friday night's performance included a "talk back" with Santoriello, the playwright, lyricist, and composer. Santoriello readily acknowledged the challenge of staging her production, describing it as "huge and hugely difficult." But she clearly thought the College was up to the task. Beaming, she said she was "really impressed!" The audience's standing ovation confirmed that assessment.



Promotional poster

A New Press Box and a Strong Season

Starting with this past season, all home baseball games have enjoyed new facilities, including a press box and permanent stadium-style seating. The

new press box provides professional, weather-proof workspaces for the announcer, statistician, scoreboard operator, and PIR broadcasters.

And there was plenty of news to broadcast this season! The baseball team won 20 games—a new record since entering the St. Louis Intercollegiate Athletic Conference (SLIAC) in 1990. (Twenty wins ties

the pre-SLIAC record for total wins set in 1986.) The team also won 12 conference games, setting another College record.

And the Records Came Tumbling Down!

In athletics, breaking a record or two a year is cause for celebration. To break a dozen in a single season is almost unbelievable, but that's exactly what happened this winter. The indoor track team set 12 new College records in two months!

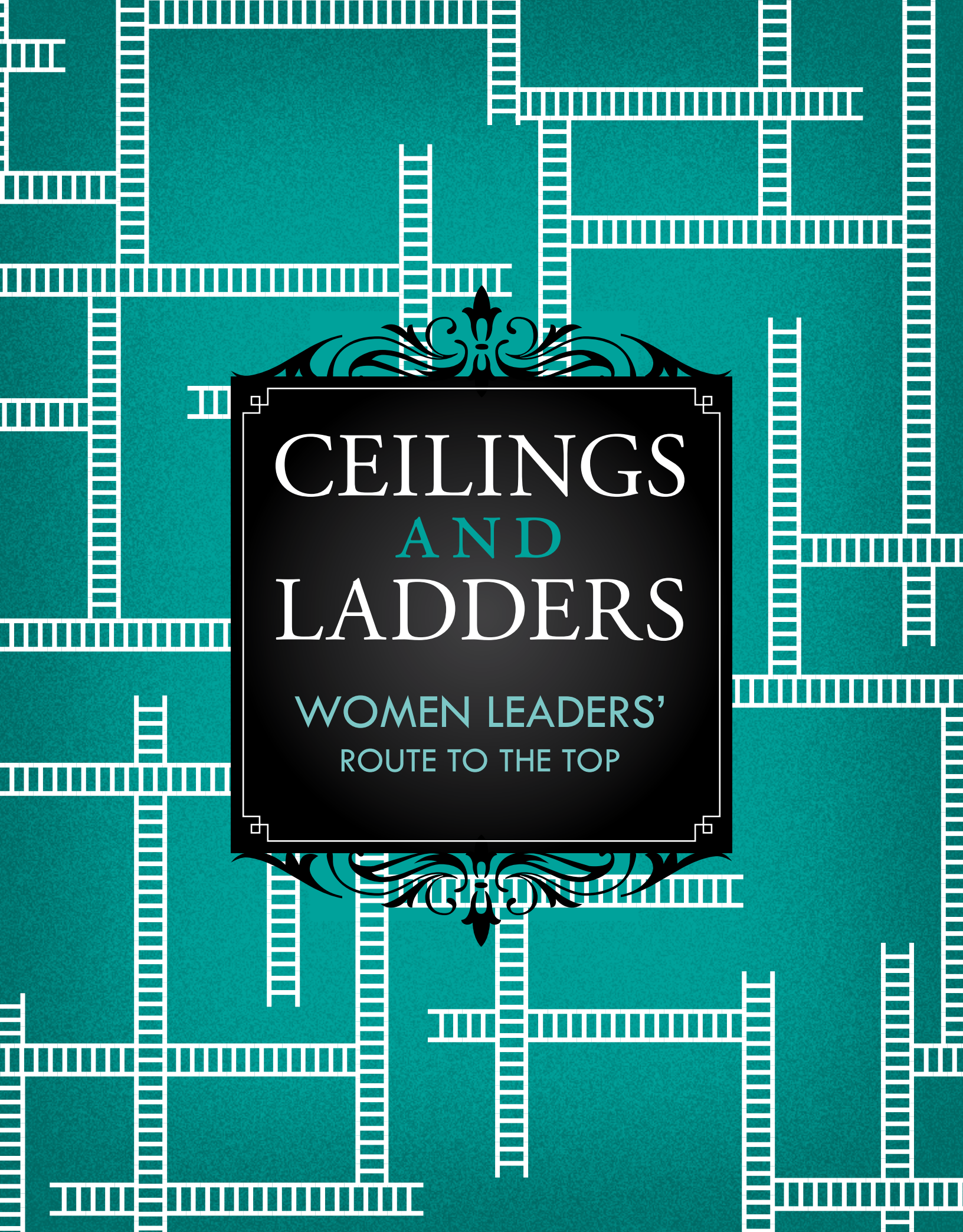
Men's Indoor Records Set

400m	Jacob Meier (51.11)
800m	Drew Clark (01:52.3)
Mile	Drew Clark (04:12.2)
3000m	Wylie Mangelsdorf (08:44.8)
5000m	Wylie Mangelsdorf (15:42.9)
800m Relay	Cameron Price, Frederick Ochieng, Alex Clapp, Clayton Harper (01:40.8)
1600m Relay	Jacob Meier, Jeff Strickland, Derrick Fleming, Drew Clark (03:27.4)
3200m Relay	Jacob Meier, Derrick Fleming, Wylie Mangelsdorf, Drew Clark (08:01.7)
Distance Medley Relay	
Wylie Mangelsdorf, Derrick Fleming, Jacob Meier, Drew Clark (10:13.8)	

Women's Indoor Records Set

800m	Casey Powell (02:24.1)
Mile	Casey Powell (05:20.7)
800m Relay	Hayley Cooke, Natasha Post, Julia Suber, Cristina Post (02:02.0)

For more information on the track team, see p. 42.



CEILINGS AND LADDERS

WOMEN LEADERS'
ROUTE TO THE TOP



As part of our review of women in leadership, the *Purpose* spoke with David Wold, the director of Principia's new Leadership Institute.

Over the years we've heard a lot about a "glass ceiling" that prevents women from reaching leadership positions. Is that barrier still in place?

Well, when you look at women in leadership in the U.S. on a relative basis, there has been significant progress. Compared to 25 years ago, there are four times as many women in Congress and 15 times as many female CEOs in the Fortune 1000. That sounds pretty impressive, right? But the dramatic increase is due to the fact that there were so few women leaders to begin with. In 1985 there were just 25 women in Congress and only two female CEOs in the Fortune 1000.

In absolute terms, women are still very much underrepresented in the leadership ranks. Fewer than 3 percent of the Fortune 1000 companies have female CEOs. And I believe only 16 percent of congressional seats are held by women.

What are some of the reasons women haven't made more inroads?

I think there are a number of factors. One is that women face a real Catch-22. The power structures in most organizations are based on masculine models where the currency is assertiveness, decisiveness, and self-promotion. But when women express those qualities, they're seen as either too aggressive or trying to be like a man.

A great example is the case of Howard versus Heidi. A Columbia Business School professor presented students with the profile of a successful venture capitalist who leveraged personal and professional networks to close deals. For one group of students, the venture capitalist was named Heidi. For the other group, the name was changed to Howard. The students saw the two as equally competent, but while they saw Howard as likable and effective, they viewed Heidi as selfish and said they'd be reluctant to hire her.

That sounds like a no-win situation. A woman has to work within the established power structure, but when she does, it makes her seem less likable.

Right. Because the masculine model is so prevalent, women often feel forced to prove they can be as masculine as men—a posture that's both unnatural and uncomfortable for many women. And even when women do assume a more masculine leadership posture, they're often labeled as aggressive and abrasive. While success and likability are positively correlated for men, they're negatively correlated for women. In other words, women are much more likely than men to have to risk being unlikable in order to achieve success. This dynamic is one of the reasons cited for women opting not to pursue leadership roles.

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You're saying women are choosing to stay away from leadership roles?

Yes, that's one of the issues being raised these days—that women are taking themselves off the leadership track for different reasons.

What kind of reasons?

One of the primary reasons is having a family. A report for the Center for Work-Life Policy found that 44 percent of highly qualified women who had left their jobs did so to care for family members, yet only 12 percent of men left their jobs voluntarily for that reason. And even if they stay in their job, women shoulder a bigger share of childcare duties. Estimates are that women spend two to three times as many hours caring for children as men do.

How does that impact their leadership?

Women feel less able to pursue leadership roles. As one female executive put it, women "lean back" when leadership opportunities arise because they're not sure they can assume additional responsibility while also meeting their family's needs. In one survey 38 percent of the women said they'd opted for positions with less responsibility than they were qualified for in order to meet family obligations.

Some might argue that's because women just aren't as ambitious as men. Do you think that's valid?

No, I don't think so. However, I do think women may be less motivated by the traditional trappings of power. Taking possession of the corner office may not hold as much appeal for women, but I think they're as ambitious as men when it comes to making a difference, being influential, etc. The real difference may be more about confidence than ambition.

What do you mean?

Women tend to undervalue their ability and question their readiness to lead. As an example, a study of MBA students revealed that 70 percent of women rated their performance as equivalent to their co-workers, while 70 percent of the men rated themselves higher than their peers.

Is that just perception, or is there evidence that women are less capable leaders?

The research I've seen shows that women are definitely as capable as men. In fact, the consulting firm McKinsey & Company did a report entitled "Women Matter" and found that companies with higher numbers of women in leadership positions enjoyed better organizational and financial performance.

So how do you explain the lack of confidence?

There's often what's called a "recognition gap." Researcher and author Ana Fels found that women receive less praise for their work than men and, over time, start to believe their accomplishments have less value. When recognition is missing, confidence is shaken and ambition stalls.

That may also explain why women and men view the path to leadership very differently.

... companies with higher numbers of women in leadership positions enjoyed better organizational and financial performance.



How so?

Well, if recognition isn't forthcoming, the road to the top probably feels a lot steeper. Men tend to view positioning themselves for promotion as a kind of game, whereas women see it more as running a gauntlet—which may be due in part to the lack of sponsors for women.

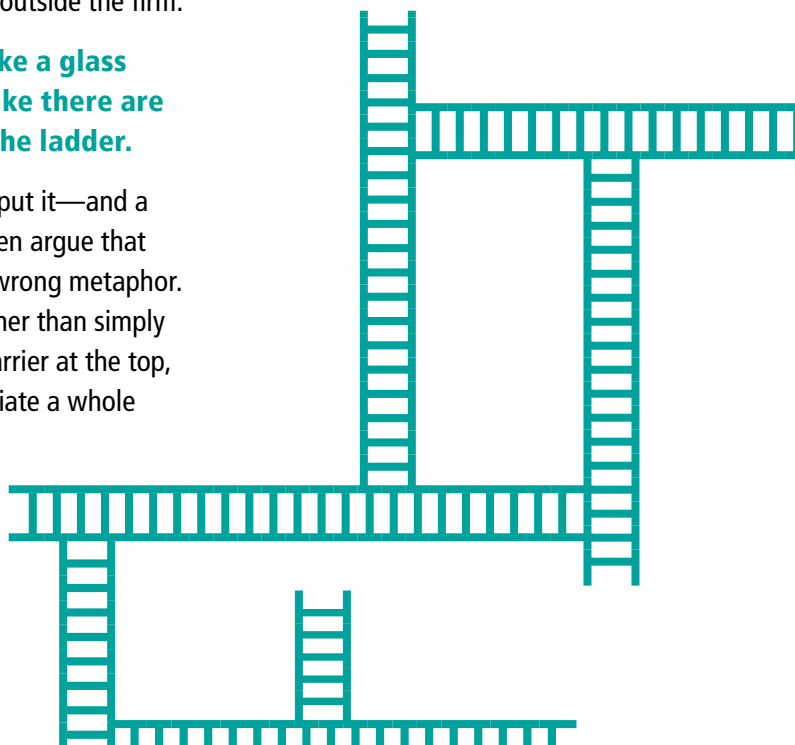
What do you mean by sponsor?

A mentor offers advice and support, but a sponsor is someone at the senior level who provides access to key executives, points out leadership opportunities, and endorses you for leadership roles. While women tend to have as many mentoring relationships as men, they have fewer sponsors. Without sponsors

within their company, women often lose out to their male peers. A study of top performing CEOs found that women were nearly twice as likely as men to have been hired from outside the firm.

That sounds less like a glass ceiling and more like there are rungs missing on the ladder.

That's a great way to put it—and a key point. Many women argue that "glass ceiling" is the wrong metaphor. They contend that rather than simply breaking through a barrier at the top, women have to negotiate a whole different route. ▮



Leadership Institute Update

Last fall, on the day before classes started, some 100 College students gathered on the Chapel Green for an afternoon of friendly competition called Board Games 2010. For several hours nine teams competed in different events such as Blind Polygons, Team Radar, and Land Barge. It was play with a purpose, produced by the Principia Leadership Institute to get house boards thinking more as a team—learning to cooperate and communicate—and to give leaders an opportunity to test their skills.

Board Games 2010 is just one way the Leadership Institute is helping students address leadership issues and develop leadership skills. Over the last year the Institute has worked with student government leaders, athletic team captains, house boards, resident assistants, and student clubs. Discussion topics have covered everything from moral courage to motivating others. Feedback has been quite positive. As one of the team captains remarked, "This was one of the most useful things I've done at Prin. It taught me a lot about leadership, myself, and life."

The Institute has a Leadership Summit planned for fall semester, bringing together a cross section of students

to tackle leadership issues and share ideas. The Summit will include a guest speaker, skill-building sessions, small-group exercises, and discussion.

Future plans include additional workshops, panel discussions, leadership trips, and the development of a leadership certificate. Look for news about these activities in upcoming e-mails and publications. You can also get more information about the Institute and find our Facebook page at www.principiacollege.edu/leadership.

~ David Wold, Director
Principia Leadership Institute



Photo by Duncan Studio Inc.

A partner with Pathfinder Engineers and Architects LLP, in Rochester, New York, **Lynn Gardner Bellenger** (C'71) is a nationally recognized leader for energy projects ranging from comprehensive energy audits to multidiscipline design for institutional, industrial, and commercial buildings. She is also the first woman president in the 116-year history of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Bellenger has received two ASHRAE service awards, two first-place ASHRAE Technology Awards, and the Lincoln Bouillon Membership Award. She majored in mathematics at the College, holds an MS in environmental science from Rutgers University, and is a licensed professional engineer. She and her husband live in Pittsford, New York.



Photo by Graham Bothwell

Immediately following graduation from the College, **Mary Brownell Bothwell** (C'73) began work as a member of the technical staff at Jet Propulsion Laboratory (JPL) at California Institute of Technology. Three decades later, she was managing nearly 700 employees and \$150M–\$175M/year projects, overseeing the development and delivery of instrument technology, flight instruments, and science data processing and archiving systems for both NASA and non-NASA space missions.

Bothwell's awards include a NASA Exceptional Service Medal, a NASA Individual Achievement Award, and JPL's Award for Excellence. She majored in physics at the College and has an MBA from the University of California, Los Angeles. She and her husband live in Pasadena, California, where she is now a Christian Science practitioner.



Photo courtesy of SHRM

Currently a consultant and international speaker on leadership and human resources, **China Miner Gorman** (US'74, C'78) recently stepped down from her post as chief operating officer for the Society for Human Resource Management (SHRM), the world's largest HR professional association with over 250,000 members in more than 140 countries. Prior to joining SHRM, Gorman was president of DBM North America, which specializes in global outplacement and leadership development. Before that, she was president of Lee Hecht Harrison, a global leader in the field of talent development.

Gorman currently serves on the boards of the Council for Adult and Experiential Learning and Jobs for America's Graduates. She is also editor-at-large of *SmartBrief on Workforce*. Gorman majored in English literature at the College and has completed the coursework for an MS in management at National-Louis University. She lives with her husband in Las Vegas, Nevada.



Photo by Romaguera Photography

After receiving her JD from Tulane University Law School, **Sharon Perlis** (C'66) served as law clerk at the Fourth Circuit Court of Appeals in Louisiana before entering private law practice in 1972. She is currently president of Perlis & Associates and is an active arbitrator and mediator. Formerly, she was an administrative law judge for the State of Louisiana and the attorney for the Louisiana Insurance Rating Commission.

Perlis's list of business and board involvement is extensive, including serving on or chairing the Port of New Orleans Commission and the regional chamber of commerce, as well as the boards of bank and trade commissions and import/export councils, among others. Along with serving on non-profit boards (e.g., she is the current chair of WYES, the local PBS station), her civic participation includes a wide range of work in education, economic development, international trade, and advocacy for small businesses. Perlis has also received numerous awards for her leadership and business accomplishments, as well as Principia's David K. Andrews Distinguished Alumni Award. Perlis majored in French at the College. She lives in New Orleans, Louisiana.

“We opened the door”—Alumnae Leaders Reflect, Assess, Anticipate

by Trudy Palmer

Meet four Principia College alumnae who shattered the glass ceiling, rising to high-level leadership positions in science, engineering, law, and management consulting. In each case, the road to success involved being the only woman in the room or the first female _____ (fill in the blank). As you'd expect, initiative, energy, resourcefulness, and self-reliance are abundantly evident among the group.

But what's absent speaks volumes as well. In particular, the absence of bitterness tells of the grace and humility that led these women to the top.


Pioneers on an uphill path

With one brief anecdote, Sharon Perlis captures the dramatic change in the landscape of opportunity for women interested in law. “I was one of three women in a class of 120 at Tulane Law School,” she explains. “It was a tough interview process, very tough and very anti-female. But now more than 60 percent of the class is female. We opened the door and by example demonstrated that women could be good students and lawyers. Now it's unquestioned and assumed, and I think that will continue to happen.”

Like Perlis, Mary Bothwell was a rarity, describing herself as “one of the very few technical women working at JPL at the time.” China Gorman and Lynn Bellenger also had few women peers, not to mention women role models in leadership positions. In addition, Gorman was usually the youngest in the room, sometimes by a couple of decades. What is it, then, that repositions women from anomaly to head of the pack? In a word (or two): hard work.

Everyone spoke of having to achieve more than the men in their field in order to be counted as their equal. “There

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was tremendous pressure on me to prove myself," Bothwell notes. "I had to work harder than the men and produce more." Gorman found a similar double standard when a man who'd just promoted her acknowledged outright, "If I have two people even semi-equal in qualifications and one is a

woman and one is a man, I'll pick the woman every time. She'll work twice as hard and create three times the results for half the money." (For the record, Gorman later confirmed that her promotion hadn't come with only 50 percent of her male counterpart's salary.)

Bellenger also found hard work and impeccable skills essential in gaining clients' confidence—and their business. "There would be times throughout my career," she comments, "when a client might seem skeptical initially, but as soon as it was obvious that I understood the systems in the building and what needed to be done to save energy, that would disappear."

Letting pride and tradition go

For all the success these women have achieved, there's not a lot of ego evident. That speaks to their character, no doubt, but also to lessons learned from patience, perseverance, and trust in God. Early in her career, when Bellenger—the only woman at an ASHRAE technical committee

meeting—was asked to take notes, she was *not* happy about it. "I was so mad," she says, "but I was also pretty much intimidated by this room full of older men, so I took notes and tried to do a good job." A few hours later as people were leaving the meeting, the man who'd directed her to take notes asked

if she'd like to chair the committee someday. Sure enough, a year and a half later she was chair.

Bothwell also found humility essential to her success—and her peace of mind. She offers this example:

I used to get very frustrated because I'd be in a meeting and I'd have what I thought was a great idea, and I'd lay it on the table and they would ignore me. Then pretty soon some guy would come up with exactly the same idea, and suddenly it was a great idea.

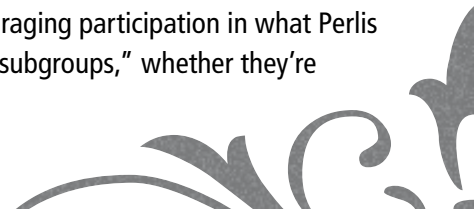
But I learned not to be insulted by that. I came to trust the fact that the right answer would always be there, and I learned that it really didn't matter what human being came up with it. My relationship with God was unbroken, and I could either experience that relationship right then, or I could get frustrated.

Pride isn't all these women chose to forgo. They also opted out of motherhood, and most of them say their career choices influenced that decision. Bothwell comments, "I didn't think it would be fair to the children with the kind of career I envisioned and ultimately had." Perlis and Bellenger express similar sentiments, but Gorman sees it a little differently. She doesn't believe her decision not to have children was "driven by [her] career," but she acknowledges that her career might have developed differently if she'd been a parent. "There was a period of time," she explains, "when my career offered relocation opportunities every 18 months in order to increase my leadership development and responsibilities. My husband and I may not have elected to accept those promotions if we'd had children at home."

Aiming for mainstream

As pioneer women leaders, these alumnae chose the road "less traveled," and as Frost's poem promises, "that has made all the difference"—not only for them but for those in their wake. These women were trailblazers, but that wasn't their objective. "We were just getting the job done," Bothwell says, echoing the others. In fact, they all chafe a bit at the label "woman leader." As Gorman puts it, "Gender is a non-starter as an issue. I'm a leader. I don't think I'm perceived as a female leader. I think I'm perceived as an effective business leader."

Most of the other women agree, to the point of downplaying or even discouraging participation in what Perlis calls "subgroups," whether they're



based on gender or race or whatever. "I don't think it's needed," she comments. "I don't think it's healthy. My objective was always to be mainstream. I'm just a leader, not a woman leader. I tried to take that approach mentally as best I could."

As the first woman president in ASHRAE's 116-year history, Bellenger has a slightly different perspective. Though she keeps gender from being the focus of her presidency, she doesn't deny its relevance. "The influx of women into mechanical and electrical engineering has been especially slow," she says. "ASHRAE has certainly supported opportunities for women, but it's one of the last professional organizations of its type to have a woman president. What's significant to me is that the men are equally excited as the women about having a woman president."

Looking ahead

Times are changing, thanks in large part to women like these alumnae. And they see more progress on the horizon. "There is a systemic movement," Gorman says, "to ensure that the best of the best—regardless of where they come from or what their background is—are able to rise to the top with appropriate levels of support." She finds this movement not only appropriate but necessary given most companies' increasingly diverse customer base. Technology also fuels diversification, Gorman points out: "People are connecting to their career development in new ways, such as social media, and that has positive impacts on everybody, including women."

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The Liberal Arts: Essential to Leadership

All four alumnae agree that a liberal arts education was vital to their success. Bothwell emphasizes the communication skills she gained, especially the ability to listen, analyze, and write. "One of my career loves," she explains, "was writing proposals—working through the tensions between engineers and scientists and getting to something everybody could agree to."

Gorman underscores the importance of strong communication skills as well. "I'm frequently shocked at people's inability to use good grammar and to construct sentences that say something," she laments. "It's getting difficult to find even very senior executives who have the ability to write." But writing is only one aspect of the communications package she's looking for. "It's the listening, it's the analysis, it's the writing," she says, "but at the bottom it's about creating relationships and connections with people so that you can get the job done. I learned how to do that at Principia."

Building on that idea, Perlis appreciates having been exposed to a wide range of people at the College. "Principia was ahead of the times with the emphasis on an international community," she notes. "It's vital that you can communicate with other cultures. Principia made me multidimensional and I'm much richer for it." Concurring with all of the above, Bellenger adds, "The emphasis on the whole man and developing all aspects of your individuality was certainly fundamental to sparking interests that led me in the direction of energy management."

Summing up, Perlis offers this anecdote confirming the value of the liberal arts: "When I was on the New Orleans Federal Reserve Board, I asked bank presidents and CEOs over the years, 'Would you prefer to hire a person with a liberal arts background or a business or finance degree?' They all to a person said they wanted people with a liberal arts education because they're literate; they have the sciences, the history, the frame of reference."

"Principia
made me
multidimen-
sional and
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richer for it."

"The information age and technology are great levelers," Perlis notes. "A flatter world makes for less bureaucracy, and bureaucracy protects the old, outdated power structure. As the upper echelon isn't as well insulated anymore, we'll see more women leaders emerging on the international scene, in politics, and in business."

In Bothwell's experience, a more diverse workforce brings many benefits, from no more dirty jokes and girlie calendars in the office to improved performance. "Diversity in the workplace is going to make us even more productive—and also make the workplace more fun," she says. "As women have come into the workforce, they bring a different kind of thinking. They look at problems in different ways; they're more transparent." Perlis

agrees, adding, "Women as leaders are just naturally more open."

Indeed, Bellenger's presidential theme—Modeling a Sustainable World—urges openness and transparency. The design process must shift, she says, from a traditional "silo approach" to a "collaborative approach" with architects and engineers working together from the beginning of the process.

That such a high-profile, industry-wide call to move from silos to collaboration comes from ASHRAE's first woman president hints at the subtle but significant shifts under way as the narrow path trod by these and other women leaders widens into a superhighway broad enough to embrace "the best of the best" no matter what they look like or where they come from. 



Photo by Edward M. Piro Roda / CNN

A Conversation with Candy Crowley

by Trudy Palmer

"Leadership is a singular noun, but there are many different variations of it that are equally effective." That's not just a casual truism. It's a perspective shaped by years of experience interacting with leaders of all stripes.

Candy (Alt, US'66) Crowley has covered the United States presidential campaigns of Pat Buchanan, George H.W. Bush, George W. Bush, Bill Clinton, Howard Dean, Bob Dole, Jesse Jackson, Edward Kennedy, John Kerry, Barack Obama, and Ronald Reagan, among others. And since the presidential nomination of Jimmy Carter, she has covered all but one of the national political conventions. Currently, she is CNN's award-winning chief political correspondent and anchor of *State of the Union with Candy Crowley*.

Tips for Effective Leadership

In large part, the alumnae we spoke with learned to be leaders by observing others, a self-training process they strongly recommend. Nevertheless, they were willing to pass along a few tips.

Lynn Bellenger

Share the credit but not the blame.

Always be kind.

Treat everyone with respect.

Work outside your comfort zone.

China Gorman

Establish a reputation for effectiveness.

Be a great team player.

Be a lifelong learner.

Learn your business inside and out.

Mary Bothwell

Listen.

Be humble.

Don't ever give up; there's always a solution.

Don't let better be the enemy of good (i.e., recognize when something is good enough).

Sharon Perlis

Question everything in your own mind.

Value people and let them know they're valued.

Act in accord with your highest sense of right.

Make decisions (i.e., don't be indecisive).

Trust your intuition.



So when Crowley says, "Leadership is one thing, but it's really a million different things," she knows firsthand what she's talking about. Quickly ticking off a few examples, she notes that former President Ronald Reagan was "a very broad-view leader with a few specific visions and goals as his focus; he didn't get bogged down in the details." On the other hand, she describes former president Jimmy Carter as "incredibly detail-oriented."

Asked which approach works best, Crowley sees the merits of each. "When you're talking about the presidency of the United States," she says, "it may be that a more detail-oriented person gets bogged down because there are just too many details. However, I would argue that President Carter's detailed knowledge of the Middle East served him well in bringing about a Middle East peace agreement."

Servant, not leader

Few would deny that the news media influence public opinion, but Crowley doesn't think of herself as an influencer or a leader. "My job," Crowley says, "is to figure out what's going on and report it as truthfully and fully as I possibly can. I don't consider that leadership; I consider it service." She continues, "I don't want to lead people into their opinions. I want to say, 'Here's something you ought to think about, and here's this other thing you ought to think about, and oh, by the way, if you think that is the right answer, have you considered this?' My goal is to provide information not so that you know what *my* opinion is but so that you know what *your* opinion is."

Of course, reporters do have opinions. Crowley would say that's stating the obvious: "None of us comes to this job without a background, a family in which we grew up and formed our opinions. Every journalist comes to the table with a bias in so far as your bias is your background." How, then, does one keep one's bias in the background (pun intended)? Here's Crowley's approach: "The keys to good journalism are understanding where your biases are and having a good editor that can squeeze them out if they show up in a story."

A passion for people

Unfortunately, people are quick to claim bias in today's hyperpartisan world. And questions—one of the main tools at a reporter's disposal—often get pegged as proof of bias. "I think we're afraid of questions now," Crowley comments. "So many people write me and say, 'How dare you ask so-and-so that question? It shows you're biased.' But the question is just the question. Sometimes people mix up what a reporter does and what bias actually is. I'm a journalist; I love questions!"

A few of Crowley's other passions come through in conversation as well. She loves getting to the heart of a matter and has a passion for people. In fact, she advises emerging leaders to be "people people." Elaborating, she says, "Leadership is about understanding the people around you, getting to know what makes them tick and how to get the best out of them, and that takes not only understanding

people but actually liking them. The best politicians I know love their job because they really like people."


The road to equality

Clearly, there's no male or female advantage to being "people people," and Crowley resists categorizing leadership

characteristics according to gender. "I really hate saying, 'Oh, yes, men and women are so different,'" she says, "because I can find you many, many exceptions on both sides, but by and large, the women leaders I have known are more practical, more goal orientated.

They're trying to make

what we've got better—or to make it work at all—whereas men tend to want to recreate the system."

Crowley believes society is still adjusting to women's increased presence in politics. "I think it's gotten better," she notes, "as people get more and more used to women in leadership positions. It takes a while for change to happen in people's heads. We can get it into the language pretty easily, but it's harder to change hearts and minds. That takes time. That takes evolution." As slow as that may sound, Crowley is hopeful, downright cheerful even, about people's capacity to grow. "I am bullish," she says, "on our ability to look up one day and say, 'Oh, there's a leader,' instead of 'Oh, there's a female' or 'There's a male' or 'There's a white guy' or 'There's a black guy.' Evolution is going to take care of all of that." 

"Sometimes people mix up what a reporter does and what bias actually is."

Mary Kimball Morgan's Lasting Leadership

"What a wonderful work is the unfolding of Christian character!" Early on a summer morning in 1891, sitting on her mother's porch in Denver, Colorado, Mary Kimball Morgan wrote this profound statement in a letter to her husband, William, putting into words a unique educational concept that would prove fundamental to the school she would establish seven years later.

Inspired insight was a central feature of Mrs. Morgan's leadership—a leadership rooted in an earnest desire to ensure that every step resulted from listening "almost breathlessly for the still, small voice of divine guidance" (*Education at The Principia*, p. 117). Not driven by a desire to create something of significance or to achieve a particular professional or social stature, she kept her focus squarely on gaining and sharing a clearer sense of what was later termed "the Christ-idea in education."

At a time when women were rarely in leadership roles, Mrs. Morgan opened a vanguard of possibility that others could follow. And others did follow! In Principia's first 25 years, what started in her carriage house progressed to a 17-building campus on 10 acres. First an Upper School program was added and then a Junior College in 1912. Enrollment grew from 16 students in 1898 to 632 by 1924. William, a prominent businessman, dedicated his time, money, and eventually the family home to his wife's vision. Clarence Howard, the well-known industrialist, put great faith and trust—and much of his fortune—in Mrs. Morgan's hands. Parents sent their children to Principia sight unseen from as far away as Australia.

Mrs. Morgan's educational ideals, steadfast commitment to Christian Science, and gentle insistence on "the honorable right way" laid the foundation for an institution still committed to the mission she established over 110 years ago. *That* is successful leadership!

(You can learn more about Mrs. Morgan's ideas and leadership in the collection of her writings entitled *Education at The Principia*.)

~ Peter Stevens
Chief Administrative Officer

Loving, Leading, and Giving Their All

by Marla Sammulì

Principia is full of leaders. You might even say leadership is commonplace here, but some are uncommonly good at it. Although they'd never volunteer to be highlighted, we'd like to celebrate a few of the School's talented student leaders. There are many, many more.



Jessica Wingert (US'11)

Leading by Teaching

At the beginning of the year, choir director Holly Barber had a problem. Both the Concert Choir and Chamber Singers needed direction at the same time. In stepped Jessica, Principia School's first student director. Helping to select music, lead rehearsals, and organize the group for performances were among her duties. Jessica loves music and is considering a teaching career, so it was a perfect fit. And if you've heard the Chamber Singers perform, you know Jessica has a talent for both.

Christian Thomas (US'11)

Leading by Example

An athlete, scholar, senior class vice president, and all-around Principian, Christian played basketball, soccer, and baseball all four years of high school, serving as soccer captain for two years and baseball and basketball captain this year. Always modest, he says, "The teams really were self-governed. When needed, I'd give a nudge in the right direction." Christian is known for his talent at nurturing younger players: "I would guide them along and help them with their problems," he shares, following the example of "the two leaders I admire most—coach Travis Brantingham and my dad." Christian is also recognized as a leader beyond Principia. Along with being chosen for the All-Conference Team in all three of his sports this year, he was elected team captain for each of them as well!

Kimberly Sheasley (US'11)

Leading by Inspiration

The only thing Kimberly loves more than Christian Science is sharing it. Inspired by her brothers at a young age, Kimberly nurtured her practice at camp, served on the DiscoveryBound National Leadership Council, and supports friends and classmates at the Upper School who come to her for prayerful help. Kimberly plans to major in religion at Principia College, and although she doesn't know what form it will take, she plans to serve the Christian Science movement. She explains, "For me, it's all about giving everything you have, loving, and having a positive outlook."

Connor Savoye (US'12)

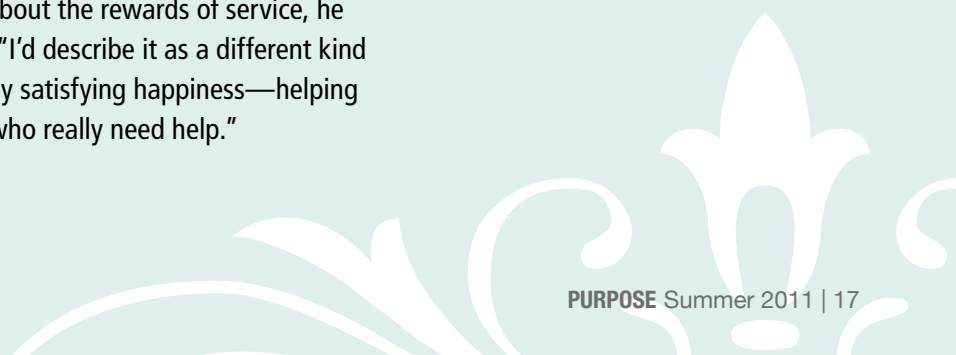
Leading by Serving

A member of the Philanthropy/Community Service class for three years, Connor has emerged as an impassioned spokesperson for the value of service learning. He has played a key organizational role in many service projects, including this year's big event—Prin Giving Day. After a stormy weather report came in the evening before, he and the adult leaders pored over their list of venues to come up with a "Plan B." The next morning, Connor stayed behind to man the phones and e-mail, ensuring everything worked harmoniously as students happily provided service to local organizations. Asked about the rewards of service, he muses, "I'd describe it as a different kind of deeply satisfying happiness—helping others who really need help."

Susie Bonwich (US'11)

Leading by Hard Work

Susie started preparing to be senior class president when she was in seventh grade. "I already had my campaign speech ready," she admits. All that preparation paid off this year as Susie spurred the Class of 2011 to raise more money than any other senior class in Upper School history! All the while, she was taking a full load of AP classes, managing the baseball and volleyball teams, and becoming the youngest manager in the region at her job at Five Guys Burgers and Fries. Guidance counselor Craig Frederickson says of Susie, "It's her ability to move people, her organization, and her tremendous follow-through that make her a great leader." Susie is much more humble: "I had a lot of people backing me. We all contributed. I just realized how much can be accomplished." 



FOR MORE INFORMATION OR TO ARRANGE A VISIT,
call 800.218.7746, ext. 3162, or e-mail enroll@principia.edu.



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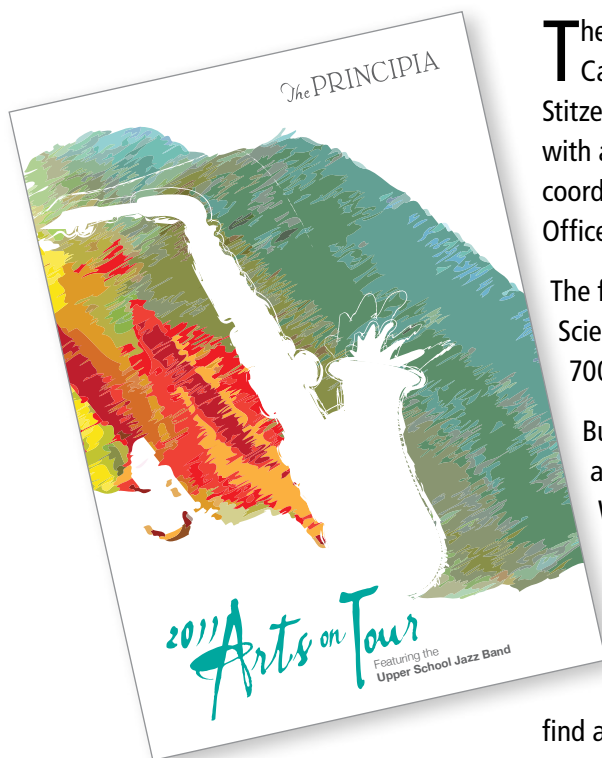
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Take a Peek at *Arts on Tour*



Program cover

The Upper School jazz band spent the first part of spring break in sunny Southern California on the School's sixth Arts on Tour trip. Led by band directors Martha Stitzel and Mike Griswold (US'80), the group shared music and the Principia spirit with alumni and friends. School administrators, parent chaperones, and the trip coordinator, Merrilee McFarland (US'99, C'03) from the Alumni & Field Relations Office, also accompanied the group.

The five-day tour included performances for Principia Clubs, Broadview (a Christian Science nursing facility), and Clairbourn and Berkeley Hall Schools. In all, more than 700 people heard the band perform.

But music wasn't the only art form on tour. Framed photographs of ten visual artworks by current Upper School students were displayed at the performances. We aren't able to share a CD of the band's music with you, but turn the page and you'll find the images of paintings, drawings, and sculpture that toured with the band.

To read more about the trip, see "Jazz Band Makes a Splash in Southern California" at www.principiawire.com. At the end of the article, you'll find a link to a blog post by Don Ingwerson, the Christian Science Committee on Publication for Southern California. The post is titled "I'm a better person because they came by . . ." and tells about the students' visit with Don and his wife Lona Ingwerson, a Christian Science practitioner.

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Mandie Fulton, US'11
pottery



Dylan Steedman, US'12
digital art



Gavin Thomas, US'11
etching



Lakiera Poole, US'12
plexiglass print

Shaan diin Cedar, US'11
Self-portrait, oil painting



Anna Tarnow, US'12
pen and ink



Juliette Roy, US'13
drawing



Catherine Binford, US'11
oil painting



Perry McVey, US'14
concept drawing



Richard Bonsi, US'12
pottery



Meet a Few of This Year's Graduates

by Heather Shotwell

Garrett Wells

Across-the-board involvement

Garrett Wells's involvement at Upper School has been both broad and deep. Having taken on Advanced Placement classes in English, calculus, and chemistry, Garrett feels well prepared for Claremont McKenna College in California next year. He has played the alto saxophone in band and jazz band, and he learned the clarinet in order to play in the orchestra for the spring musical. Garrett also traveled to California with the jazz band during spring break.

"I will most remember Principia Upper School for the good-natured people who fill the halls here," Garrett says. "The hours I've spent with them mean so much."

As chair of the Chapel Committee, Garrett helped select speakers and plan each Monday morning chapel. "I also served on the Reconciliation Board (a student and faculty discipline board), which helped me develop a strong sense of compassion for others," he explains. "I've seen wonderful healings where students have really turned things around for themselves and returned to Prin if they left for



a while. This experience taught me the importance of putting aside preconceived notions about people."

Garrett also ran cross country and played on the tennis team. "Tennis is my favorite, but cross country has really pushed me outside my comfort zone. During winter term I worked on strength and conditioning in BFS (Bigger, Faster, Stronger) with Coach Baker, and that has been awesome. I also play a lot of Frisbee," Garrett says with a smile. "A bunch of us usually toss a Frisbee on the grassy area outside the dining room after dinner."

When this was written, Garrett was planning his senior project—building a pontoon raft with fellow seniors Nate Waters and Jordan Anderson. They were busy researching design ideas and hoped to test its seaworthiness before presenting a slideshow about what they learned.



Photo by Bob Morrison

Holly Wilder

Let's dance!

The first time Holly Wilder stepped onto a stage as a very young ballet student, she fell in love with dance performance. Now, as a member of the highly acclaimed COCA Dance and Ballet Eclectica companies in St. Louis, Holly dances ballet, jazz, and modern. "I've especially appreciated the performance opportunities COCA has offered me," she notes. "The world-renowned guest choreographers and teachers have inspired and challenged me to grow as an artist."

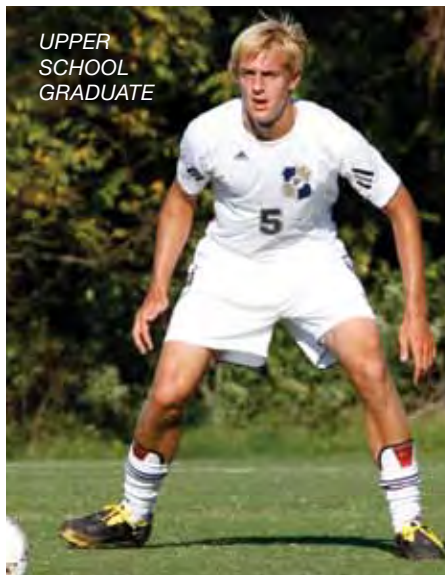
Yet Holly is the first to admit, "Finding a balance with schoolwork is very demanding. Dance classes and rehearsals are four hours, six days a week. I appreciate that Prin has been so supportive of my COCA commitment." In turn, Holly has found ways to give back

to Principia by inviting COCA dancers to perform on campus two years in a row to support fundraisers sponsored by the Community Service class.

Holly has also served on student government at the Upper School, and she choreographed one dance that the senior class performed at the fall icebreaker and another that the senior girls performed at a recent fundraiser. "I feel so connected to Prin because of the small classes, wonderful teachers, and the great friends I've made here," Holly says.

Last summer Holly took part in the Complexions Contemporary Ballet Summer Intensive in New York City. "It was my first time living on my own, and I fell in love with New York!" she exclaims.

Holly will attend Boston Conservatory next year and is thrilled with the opportunities awaiting her because of the professionalism of the program. "I'll be studying dance at the next level and will have many opportunities to perform," she explains. "Also, I am excited to be in the great city of Boston and just a few blocks from The Mother Church."



Leif Carlson

From the soccer pitch to the stage

Leif Carlson made the varsity soccer team his freshman year and has developed into an outstanding player. "I've learned that hard work pays off," he says. "The discipline we learn is not only good for the soccer pitch, but transfers to real life. Practices can be pretty tough, but we gelled as a team and got very close, mostly because we supported each other during the long runs."

Leif also played on the tennis and basketball teams. "Tennis is such a mental game," he explains. "I've learned to stay calm and focus on each point. In basketball, I wasn't the best player on the court, but I feel

I developed as a leader. It was an awesome experience."

Sports haven't been Leif's sole focus, however. He sang in the choir and was in production this year. Reflecting on the latter, he says, "I wish now I had been in the cast all four years because it was a great experience, but I'm grateful I had the opportunity this year." Leif had a remarkable physical healing during the days leading up to opening night of the show. An ankle injury placed him in the auditorium seats watching rehearsal rather than participating, and it seemed that his stage appearance was questionable. But with an expectation of healing and the support of a Christian Science practitioner, he was able to participate fully—dancing and singing on stage.

Leif has a keen interest in history and attributes much of his thirst for knowledge to Upper School history teacher Keith Preston. "His enthusiasm for the subject is amazing," says Leif, who is considering a double major in business and history next year. "I am super excited to attend Principia College in the fall," he says. "I'll be playing soccer, of course!"

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COLLEGE
GRADUATE



Kristen Rosen

Challenged to make a difference

As co-director of the Public Affairs Conference on human trafficking this spring, Kristen Rosen worked to bring a healing thought to a dark topic. "It was very inspiring to bring the community together, hear the speakers, and discuss ideas during the conference weekend," she notes. "I also learned that when work has a deeper purpose and tangible outcome, it really does not feel like work!"

Kristen came to Principia College without a preconceived plan for a major, but that didn't last long. "I took a couple of sociology classes and simply could not stop," she says. "I love that the department offers academic classes with a social and cultural conscience. They have challenged me

to think deeply about how I can make a difference." (This fall, Kristen will be a post-graduate teaching intern in the College's Sociology Department.)

Kristen has also completed two minors, religion and Asian studies. Her interest in the latter grew out of her participation on the India abroad her junior year. For her independent research topic, Kristen studied Indian marriage practices. After her return, she and another student presented their research papers at an anthropology conference at the University of Wisconsin, Madison.

When she's not studying, there's a good chance Kristen is singing or dancing. She has performed in the winter dance production since her sophomore year and recently joined Plus One, an a cappella group. "I love that Principia allowed me to get involved in such a wide variety of activities," she says. "I feel I've been able to embrace everything that Prin had to offer, and it has taught me incredible lessons about the kind of person I want to be."

Reflecting further, she adds, "The caliber of friendships I have made here is so unique. I value how naturally Christian Science is lived and shared, which is something I would have sincerely missed if I had attended another college."



COLLEGE
GRADUATE

Godfred Fianu

Valuing the liberal arts

Godfred Fianu was admitted to a highly specialized engineering program in his native Ghana, but he chose to attend Principia for a liberal arts education. He'll graduate with a BS in chemistry, with minors in math and religion. "The academic program," Godfred explains, "along with participation on the solar car team, dance production, the track team, and the Pan African Conference have given me a full Principia experience."

"I love the sense of peace I feel on this campus," Godfred continues. "I really have made Christian Science my own here. For example, before I came to Prin, I fell sick a lot. After my arrival here, I developed a deeper understanding of Christian Science

and how to apply it to my life. I soon realized I was experiencing consistently good health."

During his freshman year, Godfred's professors encouraged him to work on the solar car, which he did. He then became involved in other pursuits for a few years but returned to the solar car this year. "I love the team motto—'Glorify God and do your best'—this is truly what solar car is aiming for," he says with a smile.

Godfred has also choreographed and danced in several pieces in two different dance productions. He notes, "I actually arrived here as a very shy person, but no one would believe that now. At first I was quite nervous about dancing in front of an audience, but then I realized it was not about me, and the nervousness just dropped away."

During several school breaks, Godfred worked as a Christian Science nurse at Tenacre in New Jersey. Since he found that the patients often mirrored what he was seeing in them, he was alert to bring an expectancy of good to work each day.

Godfred plans to attend graduate school for chemical engineering after working for a chemical company to gain practical experience.



Photo by Ally Read (C'11)

Lauren Powers

Lifelong connections


"As I look back on my four years at Principia, I'm most grateful for the friendships I've made," Lauren Powers comments. "Going to college with Christian Scientists meant that I had common ground with every single person on campus, and it allowed me to build deeper relationships right away." As proof, she notes that some of her closest friends are people she met during freshman orientation, people she expects to be her lifelong friends.

Lauren had the opportunity to go on two abroads while at the College, to Greece and Turkey her sophomore year and to Prague in the Czech Republic this spring. "These trips expanded my artistic practice and deepened my

understanding of these countries and the world," she says.

In her capacity as president of the Energy Coalition, Lauren helped test for the potential of a wind tower on campus, and the club successfully advocated for the use of CFL light bulbs across campus. Lauren also helped form a sustainability council that includes staff from dining services, facilities, and purchasing, as well as student representatives.

An art major, with an emphasis on graphic design, and a business administration minor, Lauren has her sights on opening her own stationery store with a custom invitation service. (She already has a small business selling her photography in the form of greeting cards.) Lauren is a member of the Entrepreneurship Club, and as president of the Camera Club, she organized a photography show in Holt Gallery. About 150 students and faculty attended the opening.

"I appreciate the relationships I have formed with my professors," Lauren notes, "particularly in art and business. Faculty members are very knowledgeable, and they truly love to teach. I also feel comfortable talking with them outside of class. What may begin as a conversation about an accounting problem or how to complete a drawing has often turned into a deeper conversation." 

Behind the Scenes of Math + Science

by Trudy Palmer

EMPTY CLASSROOMS ARE SOMETHING TO CELEBRATE!

They mean teachers and students have fled the building into the field for hands-on research. (In math and computer science, research usually takes place indoors in a lab, but it's experiential learning nonetheless.) Enjoy this look at a few of the ways math and science students are putting what they're learning into practice.



Predicting (and filming) fractals

During winter quarter, three advanced math students and their intrepid professor, Dr. Andrew Parker (US'88, C'92), filmed part of their math seminar on fractals. They won't be submitting it to the Sundance Film Festival, however—in part because most of the judges, if they're anything like this writer, wouldn't know a fractal if it were sitting on their dinner plate or clogging their driveway during winter. Which, it turns out, are two things fractals do. You see, broccoli and snowflakes are fractals, as are crystals, ferns, Queen Anne's lace, male peacocks, pineapples, sea urchins, and stalagmites, to name only a few of the fractals found in nature.

But natural fractals weren't the focus of Parker's seminar, so there were no peacocks preening on screen. The class took a technological rather than natural

approach to the subject, generating fractals using a video feedback loop instead of a computer, which is the more typical way to create manmade fractals.

Parker explains how the experiment came about: "We had studied the theory of iterated systems (a mathematical function system with a feedback loop), and the students and I had been writing computer programs to generate a class of fractals using different methods." But Parker likes to have students put theory into practice—his PhD is in applied mathematics, after all—so he decided "to try to generate fractals

using a video camera, projectors, and a simple feedback loop."

With the help of Multimedia Services, the class created a video feedback loop by pointing a camera toward a projection of its own output. Specifically, three projectors were aimed at a wall, and a camera was set up on a tripod behind the projectors. The output from the camera was then routed to all three projectors simultaneously.



at the College

Parker continues, "Now, if the camera is aimed at a flowerpot, you get three copies of the image of the flowerpot on the wall. But if it is aimed at the same wall at which the projectors are aimed, a video feedback loop is created. In other words, you have created an iterated function system: the output of the system becomes its own input, and thus the projection system is iterated."

What were the results? Seemingly infinite, elaborate, and yet predictable

patterns. As Parker describes, "Remarkably intricate patterns can be created this way, and exactly which patterns are created can be predicted by the mathematics (the angle and size of the projections and camera, the number of projections, and so on)." That predictability was central to the lesson. "Part of our objective," Parker explains, "was to verify the effect (which we had already determined in theory) that rotating the

projectors or camera or both has on the eventual image. The students were able to recreate several fractals that we had studied on paper and in a computer lab, while discovering many new self-similar images in between."

Asked to sum up the course as a whole,

Parker likes to have students put theory into practice . . .

Parker comments on the nature of complexity: "Often the complexity we see or experience in the natural world can be modeled and explained very simply in the language of mathematics, and in particular using a self-referential, iterated

system. Self-reference can be a driving force behind complexity."

So where does the movie come in? "Much of our session was recorded using the camera itself," Parker explains, "so we have a video of our experiment and our experience." What more fitting tribute to self-referentiality could there be . . . except perhaps a peacock?

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Go, Panthers!

Why are we talking about the Panthers in a spread on math and science? Because Principia fields competitive teams in academics as well as athletics. For example, at the Association for Computing Machinery (ACM) International Collegiate Programming Contest last fall, Principia's Programming Panthers—Ross Vincent (C'12), Vladimir Darmin (C'12), and Kelsey Meidell (C'11)—placed third out of ten teams in the St. Louis area and 22nd among the 138 teams of the Mid-Central Region.

Since the ACM does not bracket contestants according to the size of their institution, the College's team was up against much larger schools, such as Washington University and the University of Illinois. Undaunted, the Panthers placed ahead of Vanderbilt and St. Louis University, as well as the state universities of Kentucky, Arkansas, and Northern Alabama, among others.

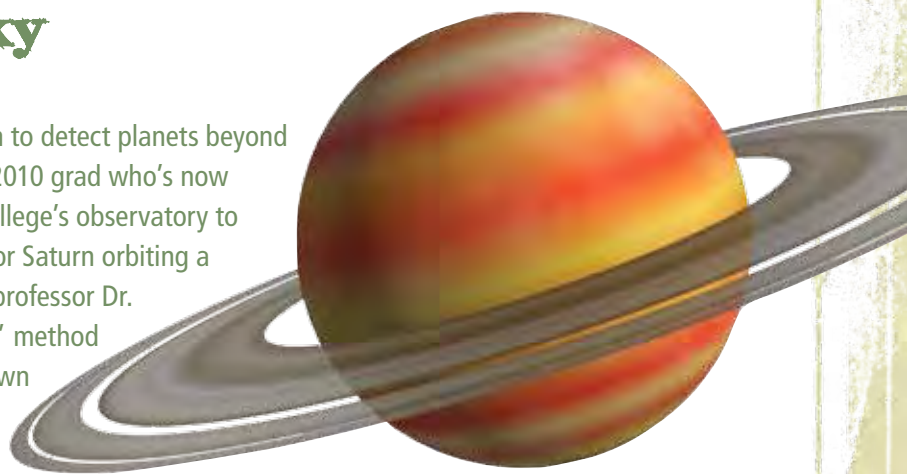
During the contest, teams are given five hours to solve between eight and twelve challenging programming problems. Their solutions must perform perfectly against unseen data sets. A single character out of place can sink a potential solution, requiring a resubmission and penalty.

Since 1990, Principia teams have placed almost without exception in the top third of their region and twice in the top tenth. Here's to a winning 2011 season for the Programming Panthers and their coach, Dr. Tom Fuller. Go, team!



An Eye into the Sky

Did you know Principia's observatory is powerful enough to detect planets beyond our solar system? During his senior year, Mark Evans, a 2010 grad who's now the physics lab coordinator, used the telescope at the College's observatory to detect an extrasolar planet—a planet much like Jupiter or Saturn orbiting a star hundreds of lightyears away. Working with physics professor Dr. Jonathan Langton (US'97, C'01), Evans used the "transit" method to detect CoRoT-2b, one of some 500 (and growing) known exoplanets. CoRoT-2b is 800 lightyears from Earth and orbits its parent star every 1.7 days.



Over the course of a night, using a CCD (similar to a precision digital camera), Evans took hundreds of images of the star CoRoT-2b orbits and its neighbors. Later, he and Langton used a computer to measure the brightness of the star in each picture and graphed its brightness over the course of the night. (When a planet moves in front of a star, the star's level of brightness drops, so even though you can't see the planet, you can tell it was there.)

Having detected a planet beyond our solar system, the Physics Department now hopes to *discover* one. Fortunately, Principia's observatory is up to the task!



College Chemists at Work

Textbooks have their place, of course, but whenever possible, chemistry students get out of their seats and into the lab, which in some cases is the great outdoors. For 20 years now, introductory and environmental chemistry classes have been gathering data on local streams and rivers and comparing pollutant levels over time. These classes regularly collect data from the Mississippi River, the creek in Elsay, Mill Creek, Piasa Creek, and sometimes from the Illinois River.

**Some days
this class re-
sembles the
popular TV
show CSI...**

In addition, one of the introductory classes examines the composition of gasoline. After taking samples of the three main grades of gasoline (with octane ratings of 87, 89, and 93), students use gas chromatography to discover how octane levels affect the makeup of gasoline.

Then there's Instrumental Analysis, a more advanced course. Some days this class resembles the popular TV show *CSI: Crime Scene Investigation*—without the all-star cast or the blood and gore. In Principia's forensic

lab, students identify the ink used to produce a document in order to determine its age and authenticity. They can also identify the accelerant used to start a fire, which is similar to an arson investigation.

Given all the experiential learning going on in the Chemistry Department, it's no surprise that students earning a BS in chemistry are expected to conduct independent experimental research. This year's senior research projects include isolating eugenol (a natural product from cloves), monitoring the degradation (or fading) of colors in artwork, and working on a way to purify water that could be used in poor countries like Haiti. This last project—



Out of the Classroom and into the Outdoors

Given the variety of ecosystems at the College, Principia students don't have to wait for the occasional field trip to conduct research. Instead, professors build their classes around the research opportunities readily available on campus. As Dr. Michael Booth (US'94, C'98), chair of the Biology and Natural Resources Department, puts it, "Our biology majors have a sustained presence in the field, practicing the craft and art of data collection and management, and learning to ask intelligent questions about the data."

In addition to the fieldwork built into their courses, students sometimes assist faculty members with their

ongoing research. For example, Booth has involved students in a California-based project where he and colleagues from Alaska and Mississippi are using molecular techniques to discover which fungal symbionts develop in Monterey pine trees at different stages of forest development. (This helps them understand the structure and function of the forest.) Students have also worked with Christine McAllister, another professor in the department, whose research in population genetics involves canvassing genes in tallgrass prairie plants to understand how these species develop drought tolerance.

Students have even been able to conduct marine research thanks to Dr. Scott Eckert (C'79), a recent addition to the department. Eckert is a research scientist at Duke University and serves as director of science for the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). This summer a student will intern at a sea turtle

rehabilitation center in the U.S. through a contact Eckert established. And in 2012 students in his sea turtle biology lab course will spend a week in Trinidad working with one of the world's largest colonies of the leatherback sea turtle.

In the meantime, Eckert is supervising a biology major studying the habits of peregrine falcons nesting on campus, and another student researching the effect of external temperature on timber rattlesnakes (also on campus).

All this activity isn't just a way of making learning interesting. It's crucial training for the future. Booth is convinced the extensive field experience at the core of Principia's biology curriculum gives students a leg up as they move on to graduate programs and research labs. The department's track record placing majors in interesting jobs and top-flight graduate programs bears that out . . . but that's a story for another issue of the *Purpose*.

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by Sarah Peck—was inspired by a summertime trip to Haiti, where Sarah worked with volunteers to restore drinkable water. (Interestingly, one of the people she worked with was alum Feli Zuhendri (C'07).)

It's worth noting that, as with the other sciences, many chemistry majors take advantage of studying at a liberal arts college to investigate non-scientific subjects as well, graduating with minors, if not second majors, in religion, Asian studies, and so on. Like the compounds they study, Principia's chemistry majors are an interesting mix!

Dr. Scott Eckert wipes sand from the ID tag on this leatherback sea turtle's flipper on Matura Beach in Trinidad, where students will study with Dr. Eckert next spring.



Base camp for the Mongolia abroad group: from here, students climbed Malchin Peak (far left) and studied the geology of the adjacent Potanin Glacier.



Photo by Ken Baughman (C'12)



What's Up Underground?

The answer is . . . well . . . mammoth, literally and figuratively. In 1999 an Ice Age mammoth was discovered six feet underground between Rackham Court and Gehner. The area soon became a paleontologic excavation site, presided over by Geology Department chair Dr. Janis Treworgy (C'76). She describes this unique learning opportunity: "Students get valuable hands-on experience excavating for bones and working in the lab to remove the dirt (matrix) from bones already discovered, sometimes finding more bones in the process." They also have opportunities to reinforce what they're learning by teaching others, since, as Treworgy notes, "part of the course involves giving tours to school and adult groups that come to visit."

Field sites off campus and around the globe


But a 17,500-year-old mammoth isn't the only thing Principia's geology students get their hands on underground. This winter, Treworgy took her Environmental Geology class to a surface coal mine to observe mining and reclamation techniques, and to a waste water treatment facility in Godfrey to learn about cleaning up sewage. And this spring, her Nonrenewable Resources class visited a working underground coal mine.

Periodically, students also have the opportunity to study geology much farther afield on the popular study abroad program in Mongolia, which Treworgy leads. Last summer, the group

traveled to various parts of this diverse country to study different geologic features. She describes a few such sites:

In the Hangay Mountains, we climbed up into an extinct volcanic cone, observed features formed by glaciers, and swam under a beautiful waterfall cascading over a basalt cliff. We drove into the Gobi Altai Mountains to the south to see fissures in the ground and a huge landslide caused by a large earthquake over 50 years ago, and then traveled farther south into the desert steppes and Gobi Desert exploring for fossils. We also trekked in the high Altai Mountains in the northwestern part of Mongolia where we camped next to glaciers that flowed down the valleys between the peaks; we were separated from the glaciers by a high moraine of mixed sediment. We later bathed in a large lake carved out by glaciers.

Fortunately, this one-of-a-kind learning experience isn't reserved exclusively for hard-core science majors. Treworgy accommodates students' varying backgrounds, in part, through individual projects. "Students had topics they researched and presented to the rest of the group at the appropriate time," she explains. "For example, one student told us about volcanoes while we were in the volcanic cone; another talked about rivers while we looked down on a river basin. This kind of peer teaching can be a very effective way of learning."

Ice Age mammoths, coal mines, volcanoes, and glaciers—effective experiential learning, indeed! 

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MEMORABLE MOMENTS

This spring, the *Purpose* contacted dozens of former faculty members from both campuses requesting a brief description of one of their most memorable teaching moments at Principia. We were open to funny, poignant, surprising, silly, or inspiring moments, and we got all of the above.

Many faculty members responded, so we'll be spreading responses over the next few issues. Enjoy!

DR. DAVID FOLTZ (C'60) College Spanish Professor

During a span of 44 years teaching Spanish language and culture to college students—28 years at Principia and 16 years at Indiana University of Pennsylvania—I conducted, taught in, and directed a total of 15 study abroad programs. I can honestly say that Principia's abroads go out of their way to build a learning structure for both students and faculty wherein life-changing experiences take place. I saw it happen over and over—students really becoming engaged in the language and culture of another people.

Take the student who took it upon himself to do a different walking tour around Mexico City every day for weeks on end. And there was the young woman who studied the penal system and won herself a guided tour of a model penitentiary. A young man trained for seven weeks in order to be competitive in a 10K race around Mexico City. And a group of students delved into the textile cottage industry near Lago de Atitlán, Guatemala.

On Principia abroads, experiential learning really happens. Students and teachers alike learn to be "citizens of the world."

Imagezoo/Imagezoo/Getty Images



DR. ARCHIBALD "JEFF" CAREY
(US'42, C'48)
College Philosophy Professor

The particular philosopher I was teaching at the time was named Leibniz, who developed the theory of "monadology," according to which everything in the universe is made up of a vast quantity of "monads." Each of us lives in a different monad. We think we see and relate to each other, but not so! God sends each of us a separate package of information including all the scenery and activity we all think we are experiencing in common. We are wrong, however, because, as Leibniz says, monads have no windows.

I always used to get to class quite early, so my students were used to finding me there when they arrived. They had been reading about the monadology of Leibniz for that day. When I arrived, I discovered that a maintenance project had been under way, and an enormous cardboard box had been left in the classroom. It was big enough to hold me, so I got inside it and kept very quiet. Soon the students started arriving, including several visiting parents! Once the class was all there, muttering about where the professor might be and why he was late, I spoke up from inside my box, in as booming a voice as I could muster, saying, "Why am I like a Leibnizian monad?"

The answer, of course, was that I was in a box with no windows. Several of them got it right away, and the rest of the class got the point so that at final exam time practically all of them remembered Leibniz and his monadology.



DR. CAROL FREUND
Preschool Teacher

Science is not my strong suit, but I was trying. While preparing an experiment with my three-year-olds, I had to move a jar containing an old, dried-up cocoon in order to find the food coloring I needed. As the experiment progressed, a child quietly said, "Butterfly." We proceeded with the experiment: placing celery, a white carnation, and a light-colored feather in different colors of water.

Soon, however, I realized that the group's attention was on the other jar, where a glorious Spicebush Swallowtail butterfly was gently emerging from the dark, crusty cocoon. It was their discovery—their very own—and it filled me with great excitement and joy. We released it on our playground and watched it soar. It remained in our area for a while. It was, indeed, a peace-filled experience.

LYNNE EVANS
Middle and Upper School
French Teacher

In my eighth grade French class, students were divided into four learning groups to prepare presentations. After three of the four groups had finished their work, the last group continued to modify theirs ad infinitum. When I called on the members to finish up quickly, one of the students turned and said, in English, "Just a sec, madame." I quickly retorted without thinking, "No more secs!" There was a deadly silence until what had already dawned upon my students became evident to me. There were quiet harrumphs behind covered mouths at first, until we were all doubled over laughing.

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BRIAN MORSE (C'61)

Upper School History Teacher

When I began teaching U.S. History at the Upper School, I graded according to the traditional scale: 70%=C, 80%=B, 90%=A. Earning a B supposedly indicated that a student was capable of college-level work. After a couple of years, however, I realized that this scale was too lenient. Although testing well, too many students received Bs who probably would struggle in college. So I created a new scale, upping the requirements: C=75, B=85, A=95.

This was not a popular decision with the students, but when the next term grades were calculated, I discovered there were more Bs or better than in previous years—a good example of what happens when right demands are made!

Word got around about that grading scale, and when I visited a fellow history teacher in his room, I saw on his blackboard that he had upped me one: his B was 87%! I wimped out and stayed with my easy B.

DR. MARY LU FENNELL

College English Professor

I was trying to teach discussion skills to one of my classes when my mind drifted off. Suddenly I realized the room was very quiet. I looked up and noticed that everyone was looking at me. A student had asked me a question and was waiting for an answer, but I'd gotten so distracted I hadn't heard it. So much for teaching good listening skills!



DR. SARAH F. PERKINS (C'76)

College Biology Professor

One of my many cherished teaching moments happened in New Zealand on a biology abroad. I had the opportunity to assist a student in overcoming what seemed an overwhelming obstacle: swimming in very deep, open seas with dolphins. The young man, from East Africa, was a diligent student and eager to be on the trip, and he was loved and appreciated by others, but he was a non-swimmer. What could have seemed an impossible venture became an inspiring and once-in-a-lifetime shared experience.

The afternoon before our swim with the dolphins, my co-teacher and I spoke with our student prayerfully about swimming in the ocean. He was eager to face fear and doubt, and he trusted a process we had devised for introducing him to the use of a wet suit, so we plunged into the sea for a practice float.

The next day as we headed into the open sea in our boats, we shared truths about God's wondrous creation, including the seas and all that lives therein. Once in the water, he relaxed. I stayed with him and an amazing thing happened. One dolphin came right up to us, swam with us, and gently nudged him, staying with us for the duration of our shared swim. 🐬

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SPEAKING UP

by Marla Sammuli

Socrates and Shakespeare knew it. Abraham Lincoln and John F. Kennedy knew it. Sojourner Truth and Martin Luther King Jr. knew it. Jesus certainly knew it.

What did these gifted leaders know?
They all understood the power of speech.

STUDENTS LEARN AND PRACTICE THE ESSENTIAL ART OF SPEECH

Today, it may seem we spend more time reading and writing—newspapers, books, articles, memos, ads, e-mail, blogs, websites, posts, texts, tweets, and more—than we do speaking or listening. But the reality is, speech is still king. It remains our primary mode of relating to one another, whether on the playground, around the water cooler, through songs or film, or in diplomatic negotiations.

In a recent article in *Independent School* magazine, teacher, author, and educational consultant Erik Palmer affirms the primacy of oral communication, even asserting that “people who speak well do better in life than people who speak less well”

(“Speaking Well,” *Independent School*, Spring 2011). He also believes that speaking is “the language art we tend to shortchange in schools.” But at Principia School, faculty work hard to ensure that the art of speaking isn’t shortchanged. From the youngest Preschool students to our graduating seniors, learning to speak thoughtfully and confidently, with poise and purpose, is an important instructional focus. Read on to learn more (or better yet, read it aloud to someone else and discuss).



Preschool teacher Rissa Arens admires a student's presentation on somersaulting.

CAN I TALK NOW?

STORIES, SONGS, AND SHARING: PRESCHOOL FOUNDATIONS

Children between the ages of two and six are full of ideas, questions, and occasional strong opinions about everything from peanut butter to airplanes. When nurtured, all this precociousness forms a natural foundation for oral communication skills that will carry them happily through life. Along with the everyday give-and-take between teachers and students, carefully planned activities in the Early Childhood Program help the youngest pupils develop their verbal virtuosity. Junior kindergarteners, for instance, choose a skill or talent to demonstrate and teach to the class. Photos of the

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presentations show beaming faces exclaiming, "I can crack eggs!" "I can do a somersault!" "I can use a hammer!" Director Dorothy Halverson (C'85) explains the value of this new addition to the curriculum: "Not only do the children get to know each other better, but they practice speaking in front of a group, being a good audience, asking appropriate questions, and responding with relevant answers. They have to think on their feet."

On Market Day, senior preschoolers share what they've learned about the country being studied that year (this time it was New Zealand). Another favorite is the annual Thanksgiving celebration featuring Pilgrim and Native American demonstrations and songs. Do you know how to catch a fish with a bow and arrow or construct a Wampanoag wetu? Senior kindergarteners do, and they can tell you all about it.

Third grader Becky Ritter delivers a monologue as Rosa Parks.

WHAT DO I SAY?

DEVELOPING STRONG SPEAKING SKILLS: LOWER SCHOOL

It's true, lower schoolers are still a long way from their first job interviews or town hall meetings. But these are prime years for them to develop the confidence to stand in front of an audience and speak their mind. Opportunities to learn how to organize their thoughts, conduct basic research, and then craft and deliver an oral message is part of the curriculum at each grade level. Here are a few examples.

First graders memorize and recite poetry and collections of important facts, such as the chronology of American presidents. They also present original inventions during their study of great American inventors, describing their inspiration for the invention, how the item was created, and what it does. Meanwhile, their classmates keep busy listening closely and evaluating each presenter on voice quality, clarity, and information presented

Formal public speaking takes a big jump in third grade when students spend the winter studying notable African Americans and then preparing and presenting monologues about them to classmates, parents, and guests. "This is a wonderful project," their teacher Kathy Bailey (C'76) explains, "because the children own every piece of it, from choosing a subject and doing the research to writing the monologue, memorizing and rehearsing it, and finally performing it—in character and in costume."

While studying China, fifth graders present a play about Chinese traditions—even delivering some of their lines in Chinese! And as part of the annual celebration that concludes an in-depth study of Ancient Greece, students perform a play combining two Greek myths. After adapting the myths, students work with their classroom teacher and a theatre professor from the College on their delivery and fluency.

"... ART IS NOT ONLY A NOUN BUT A VERB ..."

An exciting year-end highlight, Art Alive! is a talking museum. Each student researches the life of a famous artist, creates a replica of one of the artist's great works, prepares a presentation, and takes on the persona of the artist or a character from the artwork. When visitors strolling through the "museum" stop to admire an artwork, the student who created it delivers an informative monologue, speaking as the artist. "I want the students to understand that art is not only a noun (an object) but a verb (the creative process)," art teacher Louise Elmgren-Carlson (C'84) explains.





Fifth graders rehearse their play about Greek myths.

I HAVE A LOT OF IDEAS AND I LOVE TO TALK.

SPEAKING WITH EASE AND PURPOSE: MIDDLE SCHOOL

In Middle School, public reading, speech, dramatic interpretation, and addressing an audience with composure are key components of the curriculum, especially in language arts, drama, and history classes. Drama teacher Becky Stevens (C'80) notes, "The fact that our students focus on these skills a few times a week over the course of their Middle School experience is extremely valuable in creating comfort with public speaking."

Stevens' drama classes begin with games and other speaking exercises, building from there to public performances such as the sixth grade play, seventh grade monologues, and eighth grade one-acts.

Language arts students practice and perform excerpts from the plays, short stories, and poetry of Langston Hughes,

Walt Whitman, Emily Dickinson, Robert Frost, and Shakespeare, among others. They regularly discuss and debate current issues and also work to be fluid and graceful readers, including reading aloud from the Bible and *Science and Health*.

In history classes, the days of learning from a dry, dusty textbook are over. Sixth graders, who study the American Revolution, write fictional interviews of historical figures from Valley Forge and produce the interviews as podcasts. They also re-enact the Constitutional Convention, as a way of understanding the document's complex language, and participate in a Bill of Rights debate. Seventh graders write and record speeches from the point of view of Civil War generals and also produce a "This is Your Life" style of program showcasing Captains of Industry from the Industrial Age. Eighth graders perform skits related to women's rights, write and record radio broadcasts about key events of the 1920s, and create and record memoirs about the Dust Bowl. These are just a few examples of the experiential activities that get students thinking *and talking* about their learning.

UM, LIKE, I'M NOT GOOD AT TALKING IN FRONT OF PEOPLE.

BECOMING POWERFUL COMMUNICATORS: UPPER SCHOOL

In the *Independent School* magazine article mentioned earlier, Erik Palmer shares that, when surveyed, Silicon Valley employers wished for job candidates with better speaking, presenting, interviewing, and interpersonal skills. Evidently, being a good speaker is a prerequisite for success—maybe even for getting in the door. This fact isn't lost on teachers or students at the Upper School.

All four years and in a wide range of courses, Upper School students practice speaking well. Freshmen take a required Communications course. Economics students present their investment portfolios; French students are graded on conversations with the teacher; Integrated Arts students make formal presentations about celebrated artists; and advanced students of German share their fictional bicycle trips through Germany—what they saw, who they met, where they stayed, and what they learned—in German, natürlich!

In addition, debate is a new emphasis in the Upper School. Freshmen learn the basics via Lincoln-Douglas style debates that integrate content from their English, science, and history courses. For those itching to compete, the small but mighty Upper School Debate Club recently established Principia as a force to be reckoned with, garnering first and second place finishes in two National >>

Forensic League competitions this winter. (See "Principia's Great Debaters" at www.principiawire.com for details.)

All this practice in classes and clubs helps prepare students for delivering a top-notch senior speech, a requirement for graduation. Many students look forward to this opportunity to share with the community, but others admit they've "been scared [about it] since eighth grade." For those students, the experience is full of growth. "We believe it's important for students to leave high school knowing they have excelled at the challenge of presenting their own thoughts to an audience," English teacher Nancy Heimerl asserts. "It's not easy, but it's extremely valuable."

It's pretty fun for the audience, too. This year's speeches covered a wide range of topics—everything from family relationships to sports to summer jobs. Here are a few of the best lines delivered:

"Just try to act Italian."


"Oh, no! I'm becoming my mother!"

"I still don't know what my father does for a living."

"Mom, you do what you do. I'll do what I do. And I'll catch you on the flip side."

"I HAVE A VOICE"

Being able to express oneself clearly and effectively is not only rewarding but deeply satisfying. From kindergarten show-and-tell to our first date, job interview, work presentation, or testimony of healing, communicating with sincerity, purpose, and even beauty is something we all strive for.

In the recent Academy Award-winning film *The King's Speech*, King George VI of England overcomes a lifelong speech impediment. In a moment of triumph, he practically roars, "I have a voice!" Although few, if any, School students face that type of challenge, developing strong verbal communication skills takes effort nonetheless. Fortunately, with the support of teachers at all levels along the way, Principia School graduates can also exclaim, "I have a voice!" 



Eighth grade orators, from left: Jordan Van Hosen, Merran Waller, and Austin Webster

OUTSTANDING OUTCOMES IN THE OPTIMIST ORATORICAL CONTEST

Principia has participated in the Optimist Club Oratorical Contest for only two years, but both times resulted in outstanding outcomes. Last year, as an eighth grader, Kevin Ward took first place in the district competition, earning a \$2,500 college scholarship from the International Optimist Club. The topic that year was cyber-communication.

This year students responded to a broader topic: If I were the leader of the free world, the first issue I would address would be . . . (fill in the blank). Every seventh and eighth grader at Principia prepared and delivered a speech in front of classmates and a panel of School judges. Out of the ten finalists, seven competed against students from other schools at area Optimist Clubs. Three eighth graders—Jordan Van Hosen, Merran Waller, and Austin Webster—advanced to the final competition. After an exciting final round, Austin Webster won second place and a \$1,500 college scholarship.

To see Austin deliver his speech, go to www.principiaschool.org/optimist.



Members of the Upper School Debate Club (from left): Gorota Afagbegee (US'13), Matts Wilcoxon (US'12), Corbin Sellers (US'12), Briggs DeLoach (US'11), Kevin Ward (US'14)

Middle School Renovation: A Strategic Plan Priority

by Glenn Williams

With its rolling hills, expansive playing fields, and well-maintained buildings, Principia School provides children from infancy through adolescence a beautiful place to learn. But the School's functionality has not kept pace with its beauty; significant facility improvements are needed throughout the School. Far from a matter of mere brick and mortar, renovations are required to keep Principia abreast of best practices in education. And nowhere is the need more urgent than in the Middle School, which expanded last year to three grades (6th–8th).

Advances in instruction are driving the need for—and design of—the renovations. The Middle School faculty has developed an experiential, project-oriented, and team-taught approach to learning that necessitates flexible classrooms for collaboration across disciplines and easy access to the outdoors for everything from conducting research to sketching in nature.

Where we're headed

Imagine for a moment Middle School students gathering in the inviting social center before school begins. Then, during first period, one class conducts a chemistry experiment in the expanded science lab, while down the hall, language arts and social studies

teachers collaborate on a lesson about the Civil War. Later, the combined classes break into small writing groups in the flexible classroom space, and the drama teacher takes groups one by one to the outdoor amphitheatre to rehearse scenes with Civil War themes.

And all this takes place before lunch!

In the afternoon, math teachers have opened a moveable wall to accommodate a larger-than-usual study session, while in the recently relocated

art studio brimming with natural light, students wrap up work on their ceramics projects. Another class meets on the library's outside patio, sharing reviews of their recent best reads.



The new library for Preschool through Middle School

Progress thus far

Phase 1 of the Middle School renovation broke ground last summer and has been completed. Students began using the relocated bookstore during the winter and settled into the new library this spring. The new art room will open its doors this fall. This first phase also involved considerable infrastructure work, including updated HVAC and fire sprinkler systems,

electrical and plumbing upgrades, and the removal of hazardous materials.

Currently, \$1.4 million has been committed toward the three-part, \$6.3 million Middle School renovation. Support for this project is urgently needed in order to begin Phase 2, which includes a new vestibule and entryway, multipurpose room, amphitheater, office space, and restrooms. The final phase will complete the renovation of additional instructional space.

Enhancing and updating classrooms to keep pace with teachers' creativity and inspiration is a crucial component in Head of School Marilyn Wallace's

strategic vision for Principia School. If the Middle School project interests you or you would like more detailed information

about the renovation, please contact me at 314.275.3524 or glenn.williams@principia.edu.

Learn more about Principia's strategic plan by visiting us online at **www.principia.edu/strategicplan**.

Glenn Williams is chief advancement officer for The Principia.

Have Wings, Will Fly: College Track Team Sets Records

by Heather Shotwell and Trudy Palmer

What's better than a successful track team? A successful track team full of freshmen and sophomores! That's the College's enviable position: record-breaking runners with years of eligibility ahead of them. To make matters even better, the runners really like the coaches—and vice versa.

Head coach Chuck Wilcoxon (C'81) is especially appreciated, but the assistant and specialty coaches receive kudos as well. "The coaches are truly metaphysically prepared," comments Oyintari Aboro, who runs the 200 meters, "and they bring so much humor to the track, joking with each team member. Just before we head out to practice, Chuck usually says, 'We are going to work hard today—go have some fun!'"

And they do just that. As Aboro says, "We get the work done, and it is often hard work. But the team levity gets us through. We really care about each other." Time and again, students mention how caring the team is. "I love the mutual respect for everyone on the team—men

and women," senior Jeff Strickland says. Wylie Mangelsdorf, a freshman, concurs, "We are like one big family—outside of track too. We look to each other for support in other areas of our lives."

For many, that camaraderie has improved their performance. Sophomore Clayton Harper explains, "Leadership comes in all shapes and sizes on this team, not just the most athletic. Humility is key. Even the top runners have tremendous humility. Team members really get excited

about each other's races. This positive attitude has led to a lot of personal bests this track season."

Some of those personal bests have been

College bests too.

Twelve—that's right, *twelve*—indoor records were toppled this year! (See p. 5.) When the *Purpose* went to print,

the women's outdoor 800-meter record had tumbled as well after standing for nearly three decades. Sophomore Casey Powell broke it at a meet in Illinois with a time of 2:20.84. Her performance placed her fifth at that meet among all NCAA Division I, II, and III competitors. A week or so later, at the Billy Hayes Invitational in Indiana, she beat her own best with a time of 2:19:85.

Those same meets were a success for junior Drew Clark as well. In Illinois he won the men's outdoor 800 meters, and in Indiana he ran his season best in the open 1500-meter, finishing first overall. Clark is ranked third nationally in Division III in the 800-meter run and holds the number two position on the College's Top Ten list for that race. He also anchors Principia's 1600-meter Relay and Distance Medley Relay (DMR) teams, both of which broke College records during the indoor season.

Clark also competed in the NCAA Division III Indoor Track & Field Championship in March, where he finished sixth in the 800-meter run, earning athletic All-American status.



Sophomore Casey Powell (center)

Photo by Duncan Wilder

In addition, Clark represents the Midwest as one of only eight Regional Track Athletes of the Year for indoor track. (Clark has also qualified for the NCAA Division III Outdoor National Championship, which takes place after the *Purpose* goes to press. For coverage of his performance, visit **www.principiaathletics.com**.)

For all of their accomplishments, however, Powell and Clark are just two people on a team of equals. That's the tone the coaches set. Freshman Emily Osborne explains it this way: "We feel valued no matter the level of experience or athletic ability we have. There are no big egos. The coaches really set that example."

Sure enough, when asked what role coaching plays in the team's success, Wilcoxon deflects attention away from himself to his assistant coaches.

For example, he describes Phil Green (C'02), the lead assistant, as "the brains of the operation," crediting him for helping with "everything from recruiting to training design to race tactics."

That type of respect for each individual's contribution defines Wilcoxon's approach to coaching. He asks each athlete to set his or her own goals and then guides—not directs—students



Junior Drew Clark (left)

toward fulfilling them. Some goals relate specifically to performance (achieving a certain time or trying a new event); others are broader, like using track as a way to apply Christian Science to daily life. Wilcoxon ranks all goals equally, working hard to advance each one. Of course, he's happy when team members win, and he does all he can to make that possible. "The College is committed to giving students the best opportunity to compete," he says. Last winter, that commitment included taking Clark to a "last chance" meet in New York to help prepare him for the Indoor National Championship.

"There are no big egos. The coaches really set that example."

Wilcoxon's love for his team members is obvious.

Referring to them as "kids," he sounds a lot like a father. "They're nuts," he says with evident affection.


"They work incredibly hard. They have a lot of fun. And they take very good care of each other." They also feel his fatherly touch. As sophomore Calvin Nyapele says, "I have seen many coaches of other teams yelling at their runners. You will not see that here.

A Glimpse into Field Events

Due to the many track records set this year, this article has focused on runners, but athletes competing in field events are full-fledged members of the track and field family. And in one case, the family ties are literal. Siblings Aean and Aubrey McMullin, freshman and sophomore respectively, both compete in the javelin throw, and both hit season-best marks in a mid-May meet in Naperville, Illinois. Aean's throw was 36.58 meters (120 feet). Aubrey's was 24.99 meters (81.98 feet); unfortunately, hers was a scratch by a hairsbreadth. Like their teammates, Aubrey and Aean give the coaches high marks. "The coaches have made me want to keep going," Aubrey says, "even on the days that are pretty cold or too hot."

Freshman Gabrielle Schwenker offers similar praise. "The throwing coach, Geoff Hinchman (US'89, C'93), has given me so much support in my events," she notes. "At one of our meets, the field area was very far away from the track area, and he stayed with me the entire time even though we had to wait a long time for my events. He even seemed really happy to be there, like it wasn't a burden. I got two personal bests that day!"

Chuck gives us fatherly guidance, but no yelling."

Aboro, one of the few seniors on the team, sums up the students' feelings tidily. "There is only one Chuck," he says. "Thank God he's at Prin!" 



Opportunity Leads to Adventure

by Doreen Joffe

I think it was 1960 when Dr. Theodore Houpt, then director of admissions, invited me to a Summer Session scholarship treat at Principia College. The way it all came about still intrigues me.

About a year before this, I had met a Principia abroad group in Italy. Several of the students gave delightful testimonies in church one night, and we all got together after the service. They were curious about this South African girl and her travels. I had been in Europe for the last five years, traveling during the summers and working in various capitals during the winters. Perhaps they shared my story with Dr. Houpt when they returned to campus; I don't know. I had also been corresponding with Principia about the possibility of attending the College for a short term. Maybe he put 2+2 together, but again, I don't know. I never investigated the details—I just rejoiced in the answered prayer.

When the letter from Prin arrived, I ran down the street whooping with excitement. I was living in Marseille, France, at the time, teaching at the Berlitz School and taking cruise ship tourists on city tours. Dr. Houpt's letter said Summer Session was in the bag if I could manage to get there! He didn't say how . . . like on a Norwegian freighter called the Black Diamond from Rotterdam. But that's how it indeed came about. Awesome! Plus, I found my way up to Holland by hitching a ride from someone whom I happened to be put in touch with as I was praying over the how and when and where of my departure for the USA.

In Rotterdam I spent time scouting the harbor for just the right opportunity. I was seeking a workaway passage, which means you work while on the

ship and pay a minimum toward the voyage. On board, the stewardesses made me feel at home, and we worked together to keep the ship shipshape

and feed the 12 passengers. When the northern lights did their thing mid-ocean, it was scintillating, both the sight and sound.

My first full day in New York, I walked into Greenwich Village and met an officer of the Salvation Army leaving

soon for South America to assist in the aftermath of an earthquake. He overheard me chatting about picking up some Spanish while working in Madrid and Alicante, so he asked if I could help him with a refresher course. I was delighted, and I coached him for several days. In exchange the Salvation Army provided my board and lodging.

When the letter from Prin arrived, I ran down the street whooping with excitement.

PRINCIPIA
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BOSTON

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Before long, I headed to Boston for my first visit to The Mother Church. Then I traveled, at last, to Principia with the Careys, whom I met through my hosts in Boston. My share of the journey was to look after their kids, which was fun. All along the way, there were new connections. From day to day dear people met my needs. What a blessing!

Once on Principia's gorgeous campus above the big river, I settled in for two weeks in early

August. The people were so welcoming and the campus so inviting that I felt at home instantly.

In my Bible study course, taught by Iolani Ingalls, I got to know and love the Bible anew. It was presented in such an alive, modern manner that I felt my staid, traditional concepts fall away. The class laughed a lot too!

I'm still savoring my summer sojourn at Principia.

The writing class with Colin Campbell gave me a hand up on composing stories. I even coined a word, which amused the group. Commended by the teacher, I was encouraged. He told us to compose every day, and I wish I could say I do.


Before classes, early morning walks with Doc Wanamaker gave me insights into the flora as well as the many bird varieties and their songs and sounds. Over the course of the session, I also became familiar

with the campus and appreciated its favorable location atop the river bluffs. The entire experience was a time to treasure with so much to enjoy and learn—and lovely folks to interact with.

There were also inspiring chapel services and talks, and I visited the quaint town of Elsie to attend a Christian Science service. It was highlighted for me by a memorable solo graciously sung by the dean of men at the College.

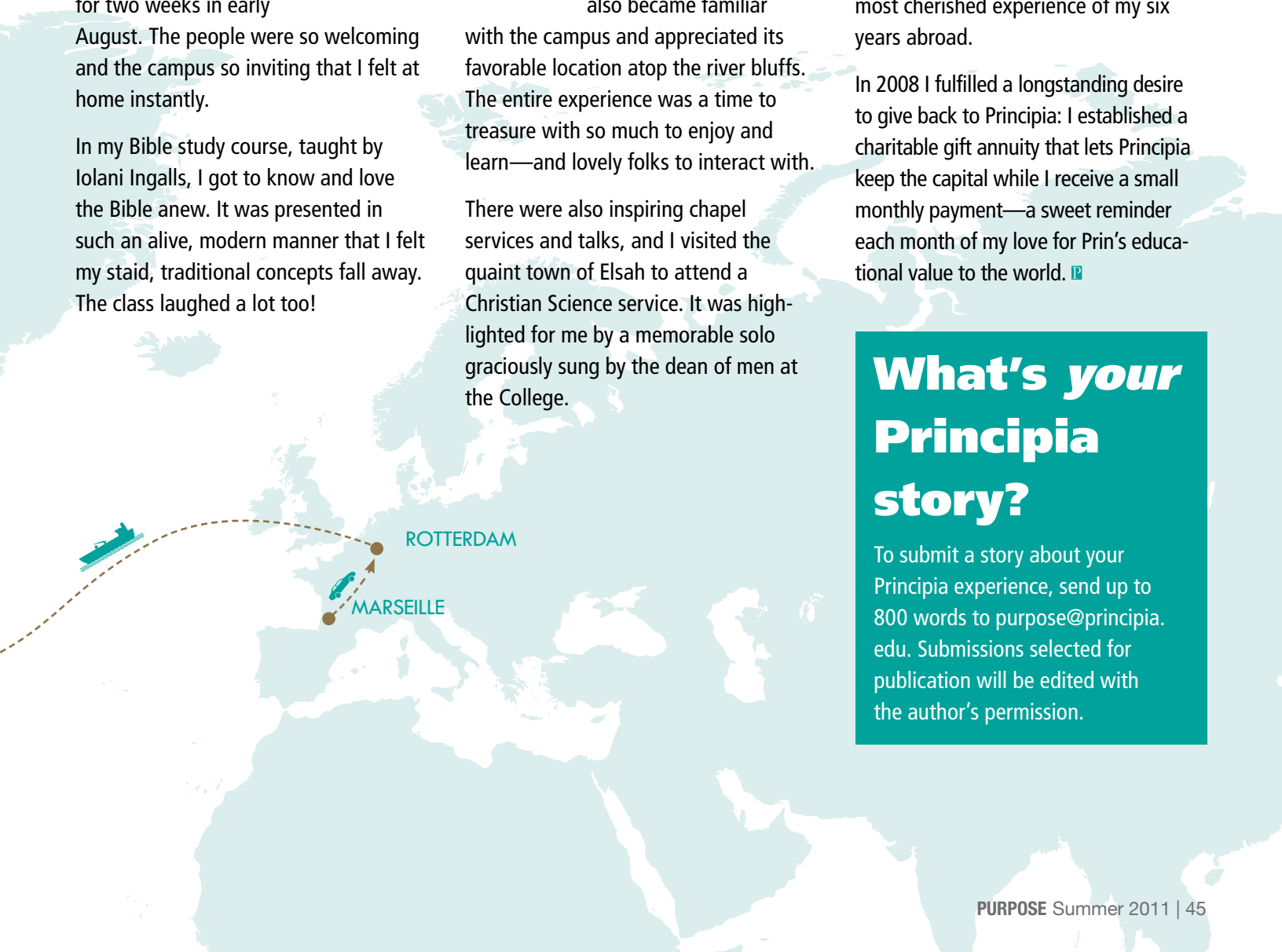
At the end of Summer Session, I stayed to volunteer, doing office work; then came an invitation to join Alumni Weekend. That, too, was a lot of fun, with so much inspiration shared. I was also given names and addresses of more new friends who requested that I visit them. Doing so allowed me to cover a number of states before returning to my home country. I married a fellow South African, and we immigrated some years later to California.

I'm still savoring my summer sojourn at Principia—a rare opportunity with many precious memories. It was the most cherished experience of my six years abroad.

In 2008 I fulfilled a longstanding desire to give back to Principia: I established a charitable gift annuity that lets Principia keep the capital while I receive a small monthly payment—a sweet reminder each month of my love for Prin's educational value to the world. 

What's your Principia story?

To submit a story about your Principia experience, send up to 800 words to purpose@principia.edu. Submissions selected for publication will be edited with the author's permission.



Awards and Achievements

SCHOOL

Eagle Scout Honors

Two Upper School students—**David Ritter** (US'12) and **Ben Sleight** (US'11)—became Eagle Scouts this year, the highest rank in the Boy Scouting program of Boy Scouts of America. Requirements include progressing through five lower scouting ranks and earning at least 21 merit badges in areas ranging from environmental science and fitness to world citizenship. Eagle Scouts must also hold a troop leadership position for six months and plan, develop, and lead a service project in their community.

Both David's and Ben's projects benefited Principia School. David built a fence around the community garden just west of Lasky Pond, and Ben built a practice pitching mound with retaining walls for the baseball team. Scouts are not allowed to do the

work by themselves; they must form, manage, and lead a team to complete the project. In both of these cases, considerable consultation was required as well—with the School Facilities Department, Town & Country's Green Team Commission (for the fence), and the School Athletic Department (for the pitching mound).

Earning Eagle Scout status marks the culmination of years of faithful participation in scouting activities. Congratulations to both boys for their accomplishment!



Andy Takao's artwork

Artistic Achievement

This spring a scratchboard of an owl created by **Andy Takao** (US'12) was accepted into the St. Louis Artists' Guild *Young Artists' Showcase*, a prestigious and highly competitive exhibition highlighting artwork from high school students in the St. Louis area.

Debaters Win First Place

At a February competition sponsored by the National Forensic League, the nation's oldest and largest speech and debate honor society, twenty-one schools fielded teams with a combined total of 450 competitors. Undaunted,

Corbin Sellers (US'12) and **Matts Wilcoxen** (US'12) progressed through many rounds of the Varsity Public Forum Debate. For this contest, two-person teams prepare two cases—one in favor of and one against the resolution—and then argue one of these sides in front of "citizen" judges. The resolution at this tournament was a timely topic: "Wikileaks is a threat to national security." After successfully arguing their way to the final round, Matts and Corbin defeated a much more experienced team and captured first place!

For information about Principia's other competitors and their accomplishments, see "Principia's Great Debaters" at www.principiawire.com.

COLLEGE

Professor Brings French Musician's Life to Light

As a doctoral student at Boston University, **Dr. John Near** (C'69), William Martin and Mina Merrill Prindle Professor of Fine Arts and College organist, began researching the organ music of Charles-Marie Widor (1844–1937). He soon discovered, however, that Widor's renown as an organist and composer constituted only a fraction of his remarkable life. As Near says, "It became clear to me that it would do Widor a grave injustice if I considered him only from the single aspect of his career as an organist." Thus began a nearly three-decade-long determination to do justice to Widor's life.



Ben Sleight



David Ritter with parents Janice and Joe Ritter

For his dissertation, Near completed the first full-scale posthumous biography of Widor, which encompassed his entire work but highlighted his career as an organist and organ composer. Next, Near spent a decade untangling the knotty composition and publication history of Widor's organ music in order to publish in 1997 a critical edition of his ten organ symphonies. Then, at the Philadelphia Orchestra's request, Near published a critical edition of Widor's Symphony in G Minor for Organ and Orchestra, which was performed in 2002.

Finally, then, Near returned to the work of further researching and writing the comprehensive biography he first imagined in graduate school. *Widor: A Life beyond the Toccata* is the result—a

616-page illumination of Widor's diverse accomplishments and contributions to the arts, the Institute of France, and civil society. Near's book—which he describes as “a labor of love”—is part of the Eastman Studies in Music Series published by University of Rochester Press. It was released on February 21 of this year, Widor's 167th birthday.

Strong Finishes for Moot Court Competitors

Sarah Butson (C'13), a political science major, and **Anthony Ackah-Nyanzu** (C'12), a computer science major, placed third in the statewide moot court competition that was part of this year's Model Illinois Government simulation held in the Illinois State

Capitol. The fourteen teams competing came from community colleges, private colleges, and major state universities, including Eastern Illinois, Western Illinois, and Northeastern Illinois. Sarah and Tony's success is especially impressive since both were first-time moot court competitors. To read more about the competition, see “Moot Court Success” at www.principiawire.com.



Sarah Butson and Anthony Ackah-Nyanzu

ALUMNI

Edgar Peara (C'47)

On April 14, Edgar Peara, an American, was honored with the National Order of the Legion of Honour, France's highest military honor. Peara received the recognition for his service during World War II as an officer in an amphibious crew that prepared the way for Allied forces in both the European and Pacific theaters.

Though very grateful for the honor, Peara is now a pacifist and a member of Veterans for Peace, which seeks to educate the public about the costs of war. Even during his wartime service, Peara avoided violence, finding peaceful means whenever possible to accomplish military objectives. A minister emeritus

of the Unitarian Universalist Church, Peara used his acceptance speech to promote peace.

Susan (Herminghaus) McLeod, C'64

A research professor of writing at the University of California, Santa Barbara, Susan McLeod was recently honored with the title of Distinguished Scholar by her colleagues.

Christine Corday (Schwartz, US'88, C'92)

Artist Christine Corday is working with KC Fabrications Inc., the company chosen to fabricate and install the National September 11 Memorial at Ground Zero. Architect Michael Arad chose her patina to blacken the bronze parapets of the memorial that inscribe

the nearly 3,000 names of those killed in the 9/11 attacks and the 1993 World Trade Center bombing. The bronze parapets surround the two one-acre sized pools that occupy the footprints of the Twin Towers. The memorial will be dedicated on 9/11/11.

Jenna “JJ” Marston (US'09)

In January, Jenna Marston won the prestigious John E. Wray award from the Baseball Writer's Association of America. The Wray award honors those with achievements in sports other than professional baseball. Attending the dinner in her honor were current Cardinals manager Tony LaRussa and first baseman Albert Pujols, along with baseball legends Ozzie Smith and Whitey Herzog, among others.

Supporting Character TRANSFORMATION

by Lee Fletcher-McGookin



When I first came to work at Principia, I thought character education consisted primarily of lovingly trying to talk an individual out of some imposing mental suggestion. But I eventually grew to realize that the more powerful and effective demonstration of character transformation came when I first quietly declared for myself that the problem was a lie about God's idea and that, in reality, there is nothing for us to be talked out of and no broken person to fix. Mary Kimball Morgan suggests this when she explains character development as "the constant erasing of the counterfeit and the bringing into expression of the real" (*Education at The Principia*, p. 77).

At Principia, character unfoldment is realized first and foremost because each of us is daily striving to entertain the Christ in our own thought, acknowledging what God is knowing clearly at that moment. This way, transformation and redemption are gently beckoned forth—without words or verbal confrontation—impelled just by the expectancy and realization of good all around us. Irma Eareckson, a renowned Principia English teacher of years ago, once proclaimed, "All the teacher can do is to make it possible for the individual to work with himself."

A good example of this occurred several years ago when a student was denied admission to the Middle School due to a poor attitude. A year later, the student enrolled as a boarder at the Upper School, but a couple of extremely tumultuous years followed. The student's anger and rudeness toward adults, along with extreme self-centeredness, made it difficult to even carry on a conversation about the many attitude and behavior problems that kept surfacing. House parents, coaches, and teachers all worked together not to allow this rebuff of them and of all Principia had to offer to influence their thought about this student. I, too, had to work diligently to hold in thought God's innocent child whenever I was with this student so that I wasn't tempted to throw up my hands in defeat.

Gradually, however, the student started to give back to the community (helping out at social events, for example) and to excel in some activities (choir and athletics among them). The last two years of this student's Upper School

career brought more and more evidence of a joyful, enormously giving attitude springing from a desire to grow personally and spiritually. No longer a loner, the student was grateful, gracious, and loving to all.

Character transformation starts from within and is solely the result of our own individual spiritual growth. It is imperative, of course, that we confront erroneous thinking wherever we find it, but I am learning not to spend a lot of time in conversation

trying to impose my own revelations on others. Instead, I'm striving to be more emphatic about knowing what divine Love, divine Mind, is revealing at that moment to me and to those involved. This supports the opportunity for them to wrestle with their own beliefs and have their own revelations. In this way, Christian Science truly is in action, and true character unfoldment results. ■

Lee Fletcher-McGookin is dean of students at Principia Upper School.



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