The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don’t know which ones.

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On the Front Cover
Arturas Zuokas, the mayor of Vilnius, Lithuania, accepts the Ig Nobel Peace Prize for demonstrating that the problem of illegally parked luxury cars can be solved by running them over with an armored tank. Photo: Mike Benveniste.

On the Back Cover
Performing chemist Daniel Rosenberg mucks with the optical properties of the contents of a glass globe. Photo: Biyeun Buczyk.

Coming Events
See WWW.IMPROBABLE.COM for details of these and other events:

November 25, 2011 Annual Ig Nobel broadcast on NPR’s “Science Friday”
February 2012 AAAS Annual Meeting, Vancouver
March 2012 Ig Nobel Tour of the UK

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WWW.IMPROBABLE.COM
LIBRETTO: CHEMIST IN A COFFEE SHOP

Words: Marc Abrahams (acts 1-4), Tom Lehrer (Act 5)
Music: Johannes Brahms, Georges Bizet, Jacques Offenbach, Luigi Denza, and Arthur Sullivan

Chemist in a Coffee Shop premiered as part of the 21st First Annual Ig Nobel Prize Ceremony, at Sanders Theater, Harvard University, Cambridge, Massachusetts, on September 29, 2011. Video of the performance can be seen at www.improbable.com.

Special thanks to Tom Lehrer for letting us use and slightly mangle his classic song “The Elements” in Act 5.

Original Cast
Stage manager and conductor: David Stockton
Barista: Maria Ferrante
Baroasta: Roberta Gilbert
The Chemist: Daniel Rosenberg
Dr. Thomas Michel: himself
A customer: Marc Andelman
Other customers: Nobel laureates Dudley Herschbach, Rich Roberts, Roy Glauber, Peter Diamond, Eric Maskin, Lou Lou Ignarro; performer Amanda Palmer; and all the 2011 Ig Nobel Prize winners and 24/7 Lecturers.
Pianist: Branden Grimmett

ACT 1: “A Chemist Comes Into a Coffee Shop…”

[WE SEE THE TWO BARISTAS ALREADY IN THE SHOP, WORKING AWAY.]

NARRATOR [WHO IS ALWAYS SIPPING COFFEE]: Tonight’s opera is about a coffee shop. It’s also about chemistry.

[THE CHEMIST WALKS INTO THE SHOP, AND THE BARISTAS QUICKLY, EFFICIENTLY SERVE HIM A CUP.]

NARRATOR: The shop has two baristas, who are really knowledgeable about coffee. It looks like they have a new customer. It looks like that customer is a chemist. It looks like the baristas are giving him a nice, fresh cup of coffee. And it looks like it’s time for me to shut up and see what happens.

[MUSIC: “Hungarian Dance #5,” Johannes Brahms]

[CHEMIST takes a big sip of coffee]

CHEMIST [SPOKEN]: Hey, this cup of chemicals tastes pretty good! Tastes like coffee, ha ha ha ha ha! That’s because it IS coffee, ha ha ha ha ha! Heh—I know you work in a coffee shop, but I bet you don’t know the secret of WHAT’S IN COFFEE, chemically speaking.

CHEMIST: [SINGS A BIT TAUNTINGLY, A CAPELLA AND NOT TOO SKILLFULLY, TO THE TUNE OF BRAHMS’ 5TH HUNGARIAN DANCE:]

Coffee isn’t what you think—
Coffee’s a…
Very simple drink.
Mostly good old H-two-O!
Hydrogen and oxygen!
That’s WATER, don’t you know!

[SPKEN:] Ha ha ha ha ha ha ha ha ha ha ha!

[SITS DOWN WITH THE COFFEE, AND POINTEDLY STOPS PAYING ATTENTION TO THE BARISTAS.]

[THE TWO BARISTAS NOW SING THIS SONG, BEGINNING WITH THE START OF THE ORIGINAL TUNE. THEY PRETEND THAT THEY DON’T KNOW THE CHEMIST CAN HEAR THEM. THE CHEMIST PRETENDS THAT HE ISN’T PAYING ATTENTION TO THEM. AS THE SONG PROGRESSES, THE CHEMIST PRETENDS HE IS NOT EMBARRASSED AT HAVING ACTED LIKE AN ASS.]

BARISTA: Coffee is a simple drink.
Common stuff.
Hardly worth a think.

BAROASTA: They make coffee everywhere,
Making coffee takes no brains,
And hardly any care.

BARISTA: Put some water into a cup.
Coffee, too.
Then just stir it up.

BAROASTA: Lots-a sugar! Lots-a cream!
Simply put: The more you add,
The better it will seem!

BOTH: HA!

BAROASTA: Beans might matter—just
Arabica!… Please!
My bean pref’rence is… well, just a little Viennese…
Though Robusta beans—have a… little extra manganese!
BARISTA: Ah, the subtle sweetness of manganese!

BAROASTA: I like beans that have lots of… P-xyleneol.
BARISTA: I like beans just bursting…

with isoeugenol.

BAROASTA: I like beans with… low dihydrositosterol.
BARISTA: That’s what you say! You, you’re a know-it-all.
BAROASTA:
Maybe I should be like Harry Potter.
[GESTURES, HALF-MOCKINGLY TOWARD THE CHEMIST]
Use a spell to purify the water.

BARISTA:
You, you’d never conjure any danger.
You’re a scholar, like Hermione Granger!

BAROASTA:
Chemistry can… show you if there’s something wrong.
Spot some sourness… or a batch that’s wayyyyyyyyyyyyy too strong.
T’see if you have… got a crappy coffee bean,
Monitor the… 2-hydroxy-pyradine.

BARISTA:
Brewing methods! Which one is best?
Choose THAT one—then ignore the rest.
Study up! Apportion your time
To the many aspects of your coffee paradigm.

BAROASTA:
Percolator? That work okay?
Or perhaps, a filter, s’il vous plait?
Do a drip? Or use a French press?
Contemplating all the options causes great distress!

BARISTA:
Try some physics?…. Use a vacuum under glass —
Exploit certain… properties of gas.
Or just boil it in water—be traditional like that.
Mess that up, though, and you will taste a rat.

BAROASTA:
Choose your method! Oh, you can really screw it up!
Un-delicious… desolation in a cup!

BOTH:
Ruination… will happen right away if you are wrong.
Coffee-making calls for… an intellect that’s strong!
Strong, strong, strong!

ACT 2: Something About Coffee…

NARRATOR [SIPPING COFFEE]: In Act Two of our opera, we are still in the coffee shop. Of course we are! Why would we go anywhere else? The two baristas look like they want to talk about coffee. Nothing new there. Let’s see what they have to say….

[MUSIC: “Habanera,” Georges Bizet, from “Carmen”]

BARISTA:
Some crave coffee that’s steamy hot.
Some crave coffee that’s chilly cool.
I don’t care if it’s hot or not.

I care about one special molecule.
Certain molecules have allure.
—Hey, I LIKE carbon, but I LOVE graphene!—
But always, ALWAYS, my chem du jour’s
That little molecule they call…
CAFFEINE!
Caffeine! Caffeine! Caffeine! Caffeine!
The very name is very nice.
Caffeine, caffeine! Caaaf-feeine!
Woo-hoo!
Perhaps I should be more precise:
C-eight H-ten N-four O-two.

[OTHERS:] Caffeine! Caffeine!
Yes, there are pedants who prefer to say a diff’rent name—
Caffeine! Caffeine!!
TRIMETHYLXANTHINE… Yes, PEDANTIC’LY, it’s the same.
Caffeine! Caffeine!
It acts in diff’rent ways on diff’rent people’s body clocks.
Caffeine! Caffeine!
It helps makes coffee so delicious a paradox.

BARISTA:
In most countries most people think
That coffee makes you fly, and makes you leap.
In Japan, though, this dreamy drink
Is what folks use to help them get to sleep.
In our neighborhood coffee shop
We brew the coffee so it’s quite dilute.
But Turks and Greeks serve it thick as glop.
And if it’s not, you’ll hear a loud dispute.
Caffeine! Caffeine! Caffeine! Caffeine!
The very name is very nice.
Caffeine, caffeine! Caaaf-feeine!
Woo-hoo!
Perhaps I should be more precise:
C-eight H-ten N-four O-two.

[OTHERS:] Caffeine! Caffeine!
C-eight H-ten N-four O-two.
Caffeine! Caffeine!
Caffeine! Caffeine!
Caffeine! Caffeine! Caffeine!
Caffeine! Caffeine! Caffeine!
Caffeine! Caffeine!
The secret of the coffee bean!

TOP: The two baristas, Roberta Gilbert (left) and Ferrante, confront their haughty new customer (Daniel Rosenberg). Photo: Mike Benveniste.
BAROASTA:
Well-made coffee
Is a bit like toffee —
Its delicious taste
Has many elements.
Furans and pyrroles,
Proteins and thiazoles,
Protocatechuic acid. All packed in
one bean!

Who can measure
All the simple pleasure
From this simple food
Which needs no supplements.
This simple fluid
Somehow accru-ed
Lots of simple compounds—Let me
mention just a few!
Aliphatic acids,
Chlorogenic acids,
And a slew of polysaccharides.
Tryptophan! Obtusifoliol!
And I tell you that's not all!
My favorite… (You knew
it! You knew it!) is
cafeeeeeeefeefefefeefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefefe!

Caffeine? I like it!
You! You like it, too!
Hey, buckaroo—What does it do?

BAROASTA:
When… you drink coffee,
Well, need I explain
That it acts on your brain!

ALL:
Your heart and kidneys and
Your sphincter, too!
Yes, on your sphincter, too!

[ALL RUSH OFF, PRESUMABLY TO THE LOO.]

ACT 3: The Coffee Diet
NARRATOR: It’s Street Performer Day
at the coffee shop. Street performers
get a free cup of coffee if they come to
the shop and perform something about
coffee. Here comes one now! And he’s
a doctor, too. It’s Dr. Thomas Michel
of Harvard Medical School. Dr. Michel
has been doing some research on the
health effects of coffee. Maybe he’ll tell
us about that…

[DR. MICHEL AND HIS ACCORDION COME
IN. THE CHEMIST (AND/OR OTHERS? THE
BARISTAS, TOO?) CANNOT HELP BUT DO A
ONE-PERSON KICKLINE TO ACCOMPANY HIM.]

Caffeine? I like it!
You! You like it, too!
Hey, buckaroo—What does it do?
When… you drink coffee,
Well, need I explain
That it acts on your brain!
Your heart and kidneys and
Your sphincter, too!
Yes, on your sphincter, too!

[REPEAT THE CHORUS]
And it has no cholesterol!
It has no nutrients at all!
Coffee, coffee, coffee, coffee, coffee, coffee,
Coooooo--
feeccccccccccccccccccccc

[NOTE: THIS SONG WAS ORIGINALLY PART OF ONE OF OUR EARLIER OPERAS—“THE ATKINS DIET OPERA,” IN 2004.]

ACT 4: In the Coffee

NARRATOR [SIPPING COFFEE]: Well, we’re still here in the coffee shop. I’m having my my fourth cup. This must be Act Four! I’m anxious to see what’s going to happen. But first, I have to pee. I’ve just had four cups of coffee. Excuse me, will you? I’ll be back. Meanwhile, you listen to the music.

[MUSIC: “Funiculi Funicula,” Luigi Denza]

BARISTA:
Just WHAT should you put in a cup of coffee?
I’ll tell you WHAT.
[OTHERS:] I’ll tell you WHAT.

BAROASTA:
The way that I respond to perfect coffee…
Well, I’m a nut.
[OTHERS:] A coffee nut.

BARISTA:
The way that I react is so PAVLOV-y—
Right from my gut!
[OTHERS:] Right from my gut! —
When certain SPECIAL THINGS are in my coffee —
And nothing but.
[OTHERS:] And nothing but.

ALL:
Sugar! Sugar! Sugar and some cream,
In proportion, working as a team!
When I put sugar in my coffee with the right amount of cream, Verily, oh verily, oh life is but a dream!

[REPEAT the “sugar! sugar!” segment]

BARISTA:
The chemistry of sugar is so simple.
Disaccharide.
[OTHERS:] Disaccharide.
Each molecule has got a sort of dimple.
On either side.
[OTHERS:] On either side.

TOP: Maria Ferrante, Daniel Rosenberg, Thomas Michel, Roberta Gilbert and Marc Andelman exhibit certain effects of the coffee diet.
Photo: Mike Benveniste.

continued >
That bliss was quite contingent on the texture—
Not like a paste.
[OTHERS:] Not like a paste.
Nothing so astringent that it vexed your Exquisite taste.
[OTHERS:] Exquisite taste. —

ALL:
Cream is smooth and rich, and mixes well!
Cream enhances coffee taste and smell,
With phospholipids and some proteins as emulsifiers that Fortify the globules of delicious butterfat!

ALL:
Sugar! Sugar! Sugar and some cream, In proportion, working as a team!
When I put sugar in my coffee with the right amount of cream, Verily, oh verily, oh life is but a dream!
[REPEAT the “sugar! sugar!” segment]

In the opera’s finale, each of the Nobel laureates sings the name of his favorite element. LEFT TOP: Peter Diamond (photo by Mike Benveniste). LEFT BOTTOM: Dudley Herschbach (photo by David Holzman). RIGHT TOP: Roy Glauber (photo by David Holzman).

**ACT 5: The Ingredients**

NARRATOR [SIPPING COFFEE]: I’m back. Just in time for the thrilling conclusion to tonight’s opera. Oh, look! The coffee shop is FILLED with customers. And they look excited! That’s because the baristas have JUST invented a new flavor of coffee. Everyone is about to have their VERY FIRST SIP. Let’s see if it’s good!

[EVERYONE ON STAGE, OTHER THAN THE BARISTAS, IS A CUSTOMER IN THE COFFEE SHOP, AND HAS A CUP IN HAND.
THREE OR FOUR CUSTOMERS EACH TAKE A SIP OF COFFEE AND ASK THIS QUESTION—ASK IT SEVERAL TIMES SO THAT THE AUDIENCE CANNOT POSSIBLY MISS THIS SETUP TO THE JOKE—BEFORE THE SONG BEGINS:]

[SPOKEN:] “Wow! This is the BEST cup of coffee I’ve ever tasted! What’s IN it?”

[BARISTA and BAROASTA DIVIDE THE LYRICS BETWEEN THEM. AT CERTAIN POINTS ONE OR ANOTHER CUSTOMER EACH SINGS ONE LINE.]

[MUSIC: “Modern Major General” by Arthur Sullivan, words by Tom Lehrer (“The Elements,” slightly modified)]

There’s antimony, arsenic, aluminum, selenium, And hydrogen and oxygen and nitrogen and rhenium, And nickel, neodymium, neptunium, germanium, And iron, americium, ruthenium, uranium, Europium, zirconium, lutetium, vanadium, And lanthanum and osmium and astatine and radium, And gold and protactinium and indium and gallium, And iodine and thorium and thulium and thallium.

There’s yttrium, ytterbium, actinium, rubidium, And boron, gadolinium, niobium, iridium, And strontium and silicon and silver and samarium, And bismuth, bromine, lithium, beryllium, and barium.

BARISTA [SPOKEN, AS PIANO FILLS SOFTLY UNDER]: Isn’t that interesting? There’s no need to write it down! Because we now sell BOXES of this coffee, in stores everywhere! You can buy this beautiful coffee—in this BEAUTIFUL BOX.

[SOMEONE HOLDS UP A GIANT BOX] Isn’t it a beautiful box? All the ingredients are listed ON THE BOX!!

[MUSIC RESUMES]
And lead, praseodymium, and dysprosium and scandium and cerium.
And manganese and mercury.
There’s holmium and helium and argon, krypton, neon, radon, xenon, zinc, and rhodium, and chlorine, carbon, cobalt, copper, tungsten, tin, and sodium.

BAROASTA:
These are the coffee flavors listed on the side of our BOX….
We like to think that some of them you will not see at STARBOCKS.

Roberta Gilbert leads everyone in the rousing, coffee-buzzed opera finale. Photo: Mike Benveniste.

There’s holmium and helium and hafnium and erbium, and phosphorus and francium and fluorine and terbium, and manganese and mercury, molybdenum, magnesium, dysprosium and scandium and cerium and cesium.
And lead, praseodymium, and platinum, palladium, promethium, potassium, polonium, and tantalum, technetium, titanium, tellurium, and cadmium and calcium and chromium and curium. There’s sulfur, californium, and fermium, berkelium, and also mendelevium, einsteinium, nobelium, and argon, krypton, neon, radon, xenon, zinc, and rhodium, and chlorine, carbon, cobalt, copper, tungsten, tin, and sodium.

A Guide to the Stars
* Nobel Laureate
** world’s highest IQ
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**** misspelled
***** sibling rivalry
****** six stars
******* Ig Nobel Winner

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