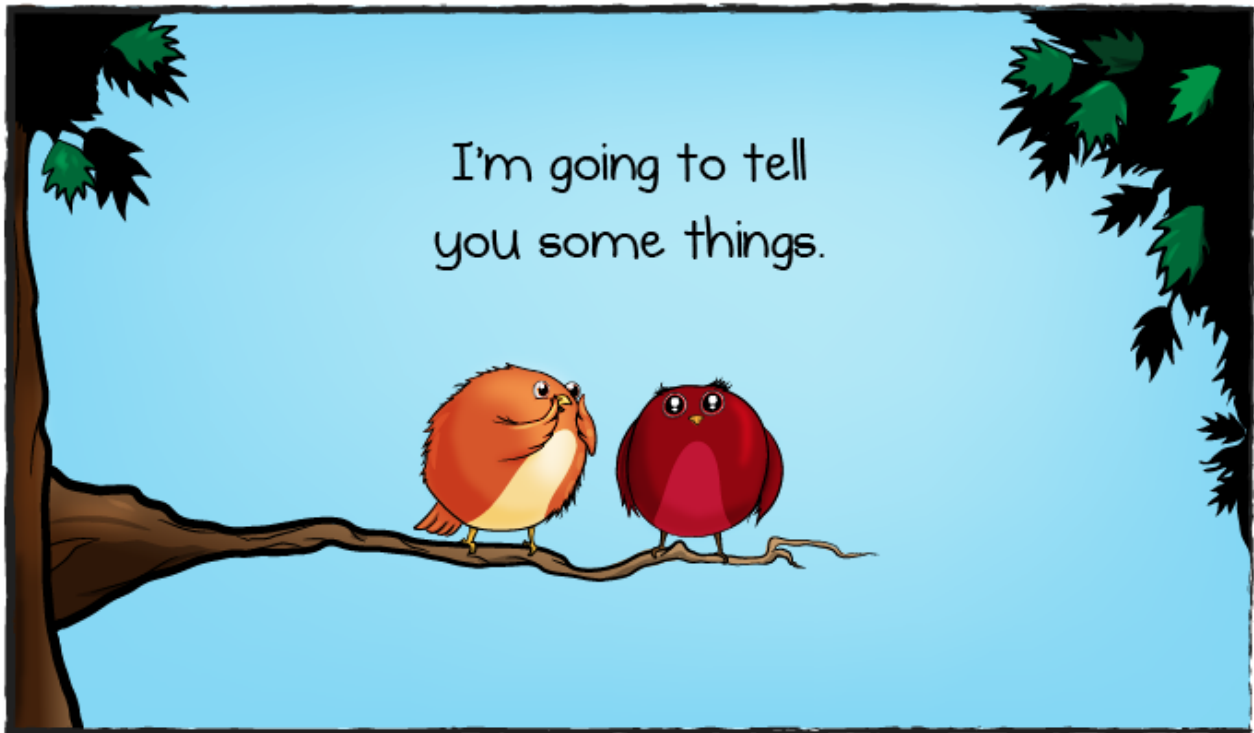


Regular version
(contains profanity)

(/comics/believe_clean)

↓ Classroom-friendly version
(no foul language)

(/comics/believe_clean_clean)






You have good reason not to.



But I need you to keep listening,
regardless of what you believe.





I don't care if you're liberal, conservative,
or somewhere in between.

I don't care if you're a cat person,
a dog person, or a tarantula person.

Morning person or night owl.

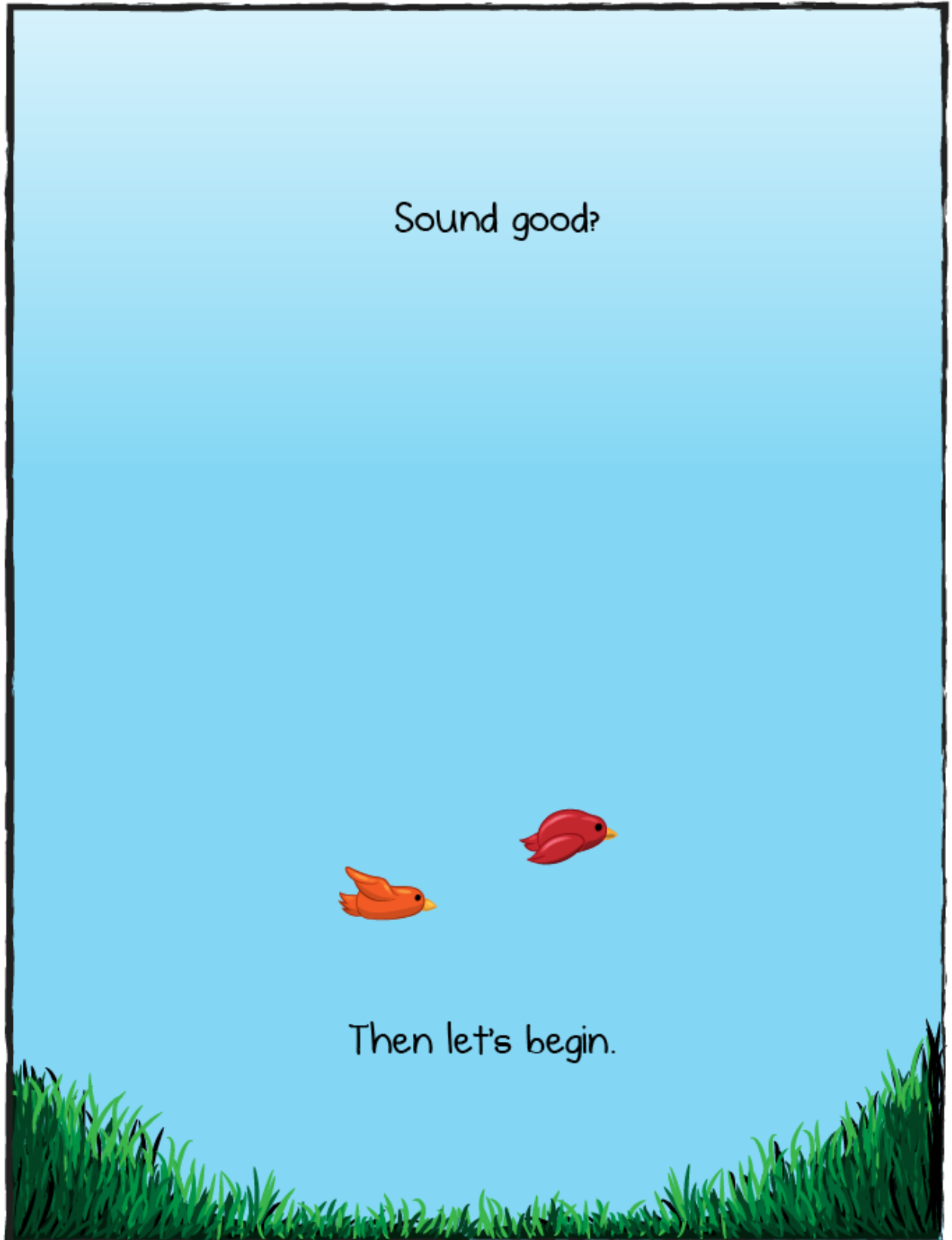
iPhone or Android.

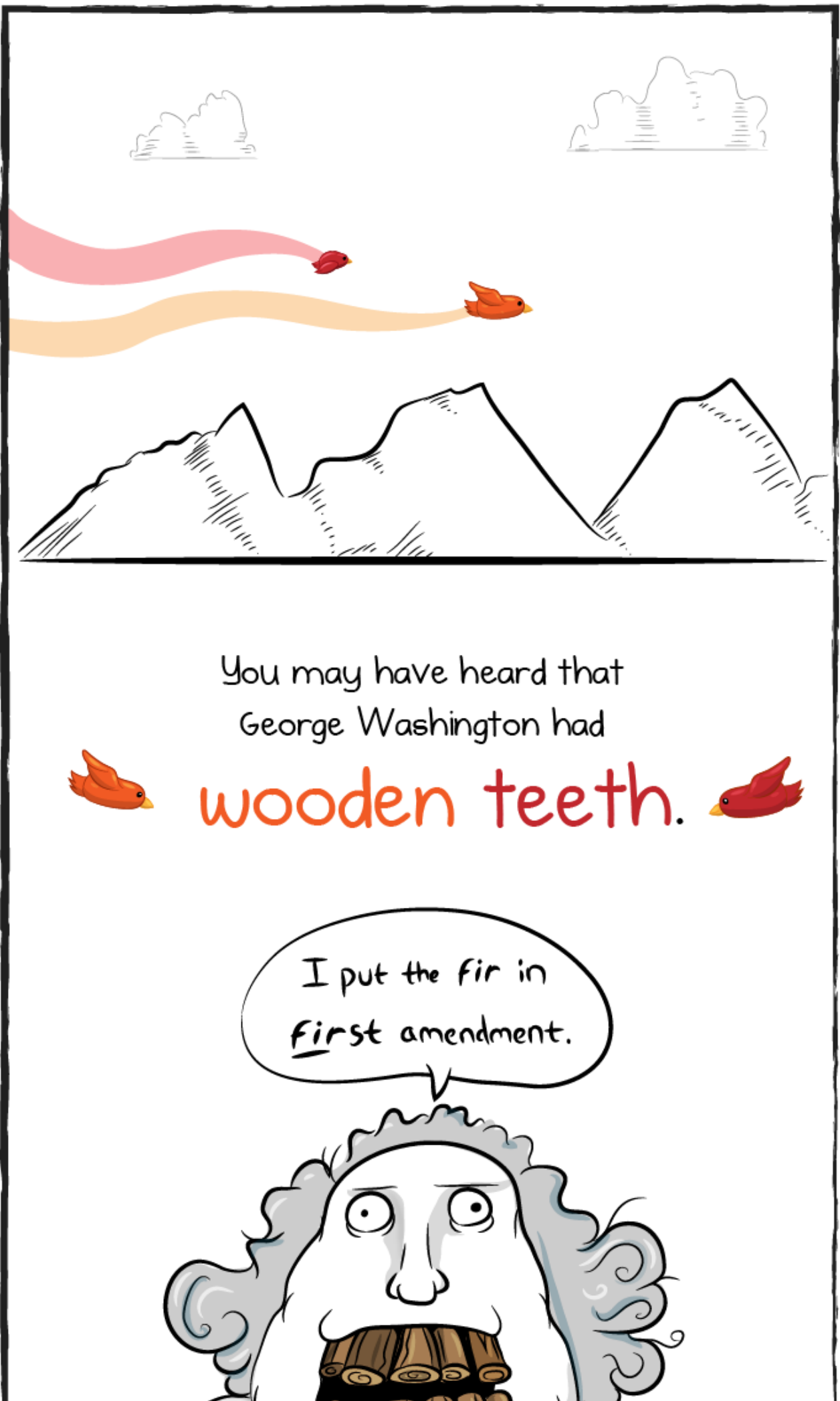
Coke or Pepsi.

I don't care.

All I care about is that
you read this to the end.





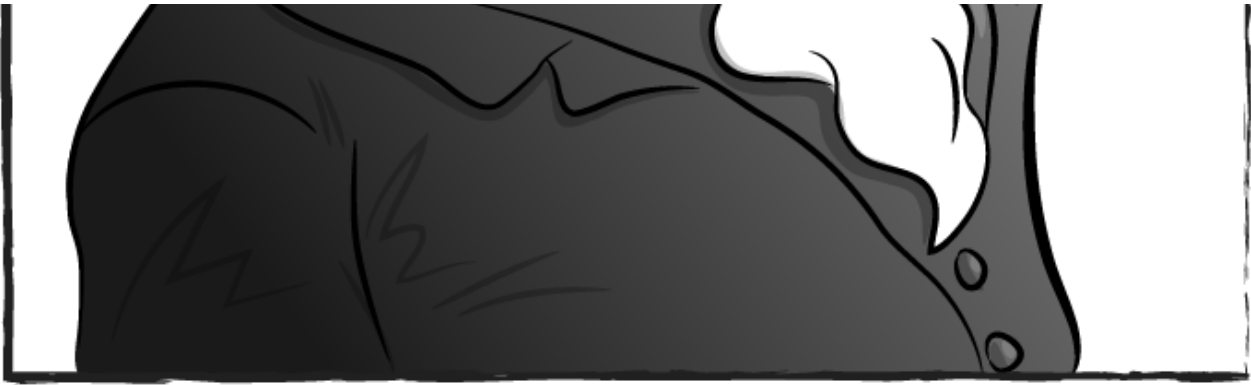




He lost most of his teeth in his twenties and had a set of dentures made out of wood.

It's a disturbing visual:
the founding father, commander-in-chief,
and first President of the United States
click-clacking his way through a ham sandwich.





Except it isn't true.

In 2005, at the National Museum of Dentistry in Baltimore, laser scans were performed on Washington's two-hundred-year old dentures, and found them to be made of gold, lead, hippopotamus ivory, horse, and donkey teeth.





His mouth was a petting
Zoo of nightmares.

Sources: ★ SOURCE 1 (<http://www.nbcnews.com/id/6875436/>) ★ SOURCE 2
(<http://www.mountvernon.org/george-washington/the-man-the-myth/the-trouble-with-teeth/>) ★ SOURCE 3
(<http://www.history.com/news/ask-history/did-george-washington-have-wooden-teeth>)

Upon learning this information,
I want to ask you something:

how did it *feel* to learn this new fact
about George Washington's teeth?

• • •

I stated a thing,
I provided evidence of that thing,
and presumably you now believe in
the thing I stated.

Presumably, your belief in the
composition of George Washington's
teeth has changed with little or no

friction.





Presumably, the next time you're at a party and George Washington's teeth come up in conversation, you're going to proudly impart this newfound knowledge to your fellow partygoers.



Yes?



Terrific, let's continue.

What

if I told you George Washington
had another set of false teeth?

What if I told you this other set wasn't
made from wood, ivory, or any of the
aforementioned materials?

What if I told you it was made
from the teeth of slaves?

Sources: ★ SOURCE 1 (https://www.nytimes.com/2014/04/29/upshot/george-washingtons-weakness-his-teeth.html?_r=0) ★ SOURCE 2 (<http://gwpapers.virginia.edu/george-washingtons-false-teeth-come-slaves-look-evidence-responses-evidence-limitations-history/>) ★ SOURCE 3 (<http://www.snopes.com/george-washington-wooden-teeth/>)

Now,

let's try this again:

How did it feel to learn *this* fact
about George Washington?

• • •

Any more of that friction
I mentioned earlier?

Before we go any further

before we go any further,
allow me to reiterate:

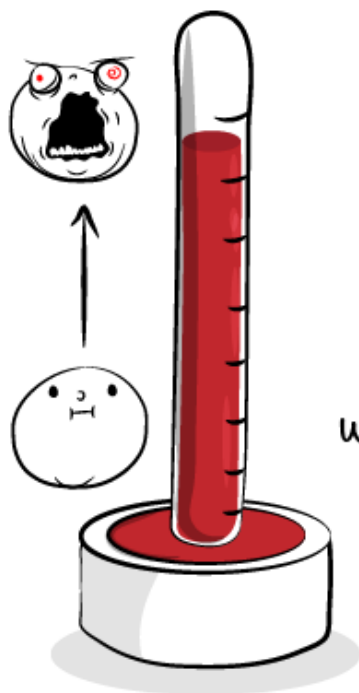
I am not here to convince you that
George Washington was a bad person.

I could go through all my cited sources and
cherry-pick arguments that either
deify or ~~demonize~~ George Washington.

I could paint a portrait of a monster,
or I could exonerate a patriot.

But as I said before, I don't care.

It's not the point.

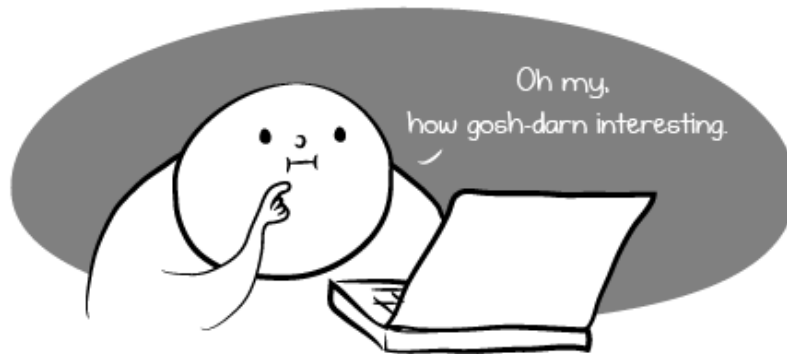


The point
is to give you an emotional
barometer of how you feel
when presented with new ideas.

Because you may have noticed that the first
fact about George Washington's teeth was

rather easy to accept.

I would even wager that when I told you the first fact, you accepted it without question.



But when I told you the second fact, you immediately checked my sources and are now furiously composing an informed-yet-incendiary retort which you will boldly deliver to me in the form of a sour, blustering Facebook comment.



And that's okay



Let's try a few more.

. . .

Napoleon Bonaparte was not short.

He was 5'7, which was taller than
the average Frenchman of the time.



Sources: ★ SOURCE 1 ([https://books.google.com/books?](https://books.google.com/books?id=Q7CkHF7xTuYC&pg=PT116#v=onepage&q&f=false)

[id=Q7CkHF7xTuYC&pg=PT116#v=onepage&q&f=false](https://books.google.com/books?id=Q7CkHF7xTuYC&pg=PT116#v=onepage&q&f=false))

★ SOURCE 2

(<http://www.cbsnews.com/news/forget-napoleon-height-rules/>)

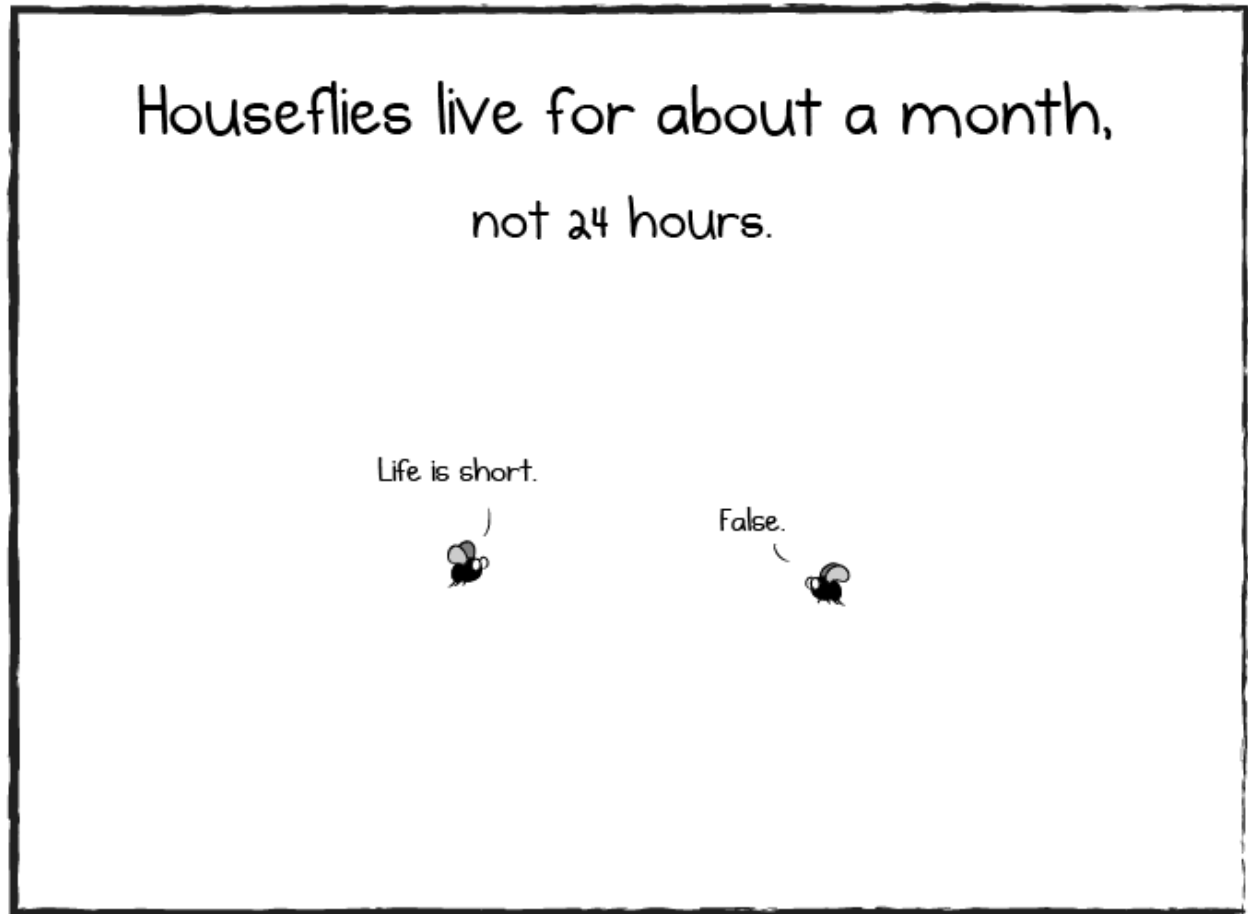
Thomas Crapper did not invent the flush toilet, nor did the word "crap" come about because of his name.



Sources: ★ SOURCE 1 (<http://www.snopes.com/business/names/crapper.asp>)

★ SOURCE 2

(http://content.time.com/time/specials/packages/article/0,28804,2016258_2016259_2016274,00.html)



Sources: ★ SOURCE 1

(<https://web.archive.org/web/20130301174011/http://www.newton.dep.anl.gov/natbltn/400-499/nb453.htm>)

★ SOURCE 2

(https://en.wikipedia.org/wiki/Housefly#Life_cycle)

Humans don't explode in a vacuum.

Nor do we boil.

We just pass out from lack of oxygen
and then we die.

The three emotional phases
of being blown out of an airlock:



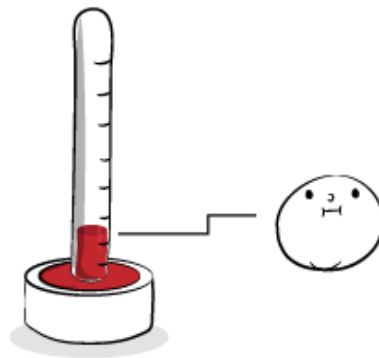
Sources: ★ SOURCE 1 ([http://www.webcitation.org/68Aef3glC?](http://www.webcitation.org/68Aef3glC?url=http%3A%2F%2Fimagine.gsfc.nasa.gov%2Fdocs%2Fask_astro%2Fanswers%2F970603.html)

[url=http%3A%2F%2Fimagine.gsfc.nasa.gov%2Fdocs%2Fask_astro%2Fanswers%2F970603.html](http%3A%2F%2Fimagine.gsfc.nasa.gov%2Fdocs%2Fask_astro%2Fanswers%2F970603.html))

★ SOURCE 2 (<http://www.abc.net.au/science/articles/2005/04/07/1320013.htm>)

Again,

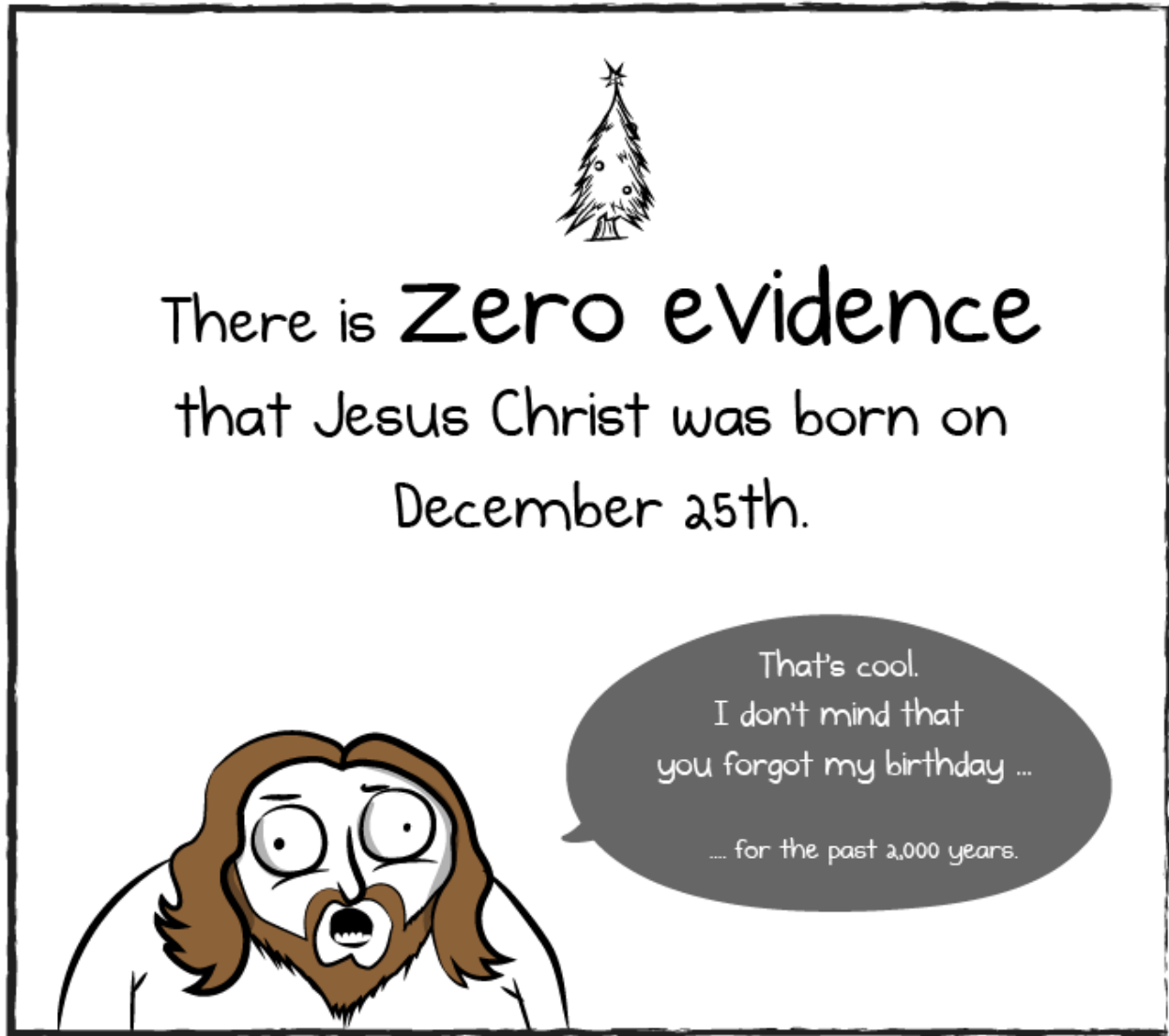
as you read these facts,
take stock of how you feel.



I'm guessing you softened
to the last few fairly easily.

Let's try a few more,
and then we're done.

, . .



Sources: ★ SOURCE 1 (<https://www.ucg.org/the-good-news/biblical-evidence-shows-jesus-christ-wasnt-born-on-dec-25>) ★ SOURCE 2 (<http://www.livescience.com/42976-when-was-jesus-born.html>) ★ SOURCE 3 (https://en.wikipedia.org/wiki/Date_of_birth_of_Jesus)

The Pledge of Allegiance was
written by a socialist.

Sources: ★ SOURCE 1 (<http://www.ushistory.org/documents/pledge.htm>) ★ SOURCE 2
(https://en.wikipedia.org/wiki/Francis_Bellamy) ★ SOURCE 3 (<http://boingboing.net/2016/09/10/a-socialist-wrote-the-pledge-o.html>)

Six of the seven justices who
voted in favor of Roe v. Wade
were Republican-appointed.

Sources: ★ SOURCE 1 ([http://www.heraldcourier.com/news/roe-v-wade-approved-by-](http://www.heraldcourier.com/news/roe-v-wade-approved-by-republican-appointees/article_4fa2fb82-d738-5a11-95b6-650037c19451.html)

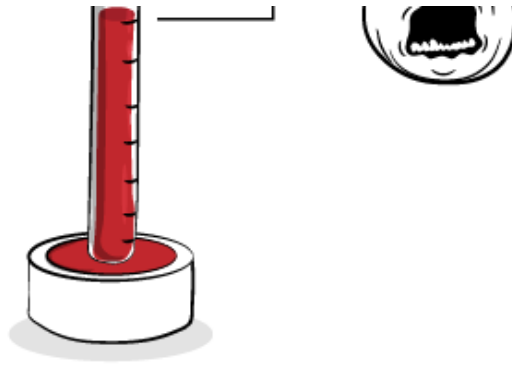
[republican-appointees/article_4fa2fb82-d738-5a11-95b6-650037c19451.html](http://www.heraldcourier.com/news/roe-v-wade-approved-by-republican-appointees/article_4fa2fb82-d738-5a11-95b6-650037c19451.html)) ★ SOURCE 2

(https://en.wikipedia.org/wiki/Roe_v._Wade#Supreme_Court_decision) ★ SOURCE 3 (<http://www.u-s-history.com/pages/h2603.html>)

How'd those last three feel?

Depending on your beliefs,
I'm guessing it may have put
some of you about here?





At the very least,
you can concede that it *felt* different to
hear those statements compared to the
ones about Napoleon or houseflies.

Yes?



But why?



Why

do we easily soften to some ideas,

but not to others?



Why

do we gnash our teeth when presented with evidence counter to our beliefs?



Why

do we not only ignore this evidence, but dig our heels in deeper and believe more strongly in the opposing argument?

Why

would providing MORE evidence make someone LESS likely to believe in an idea?



It seems backwards and

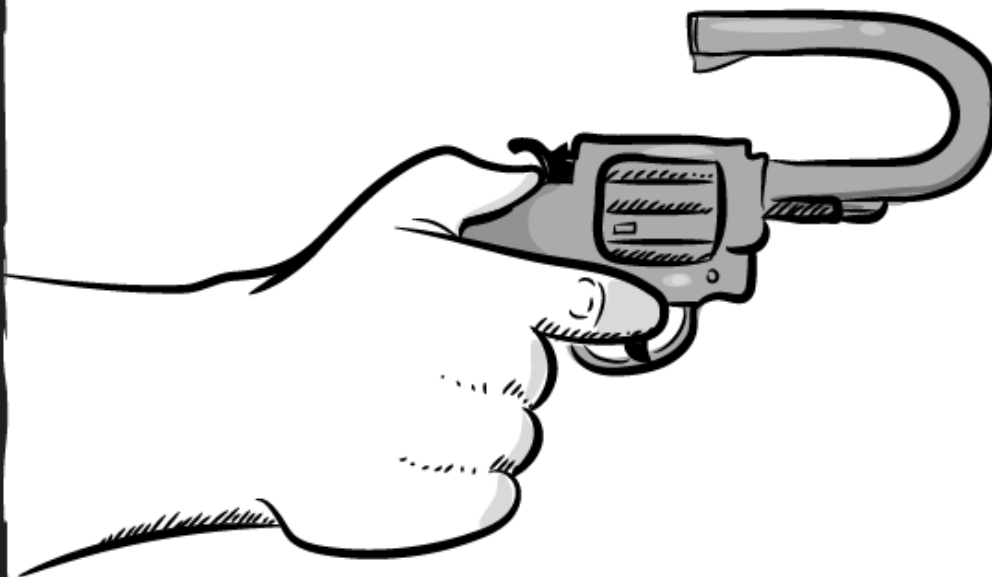


batbum-crazy-bonkers to me.

It turns out batbum-crazy-bonkers
has a name in the world of neuroscience.

It's called the
backfire effect.

and it's a well-documented
psychological behavior.



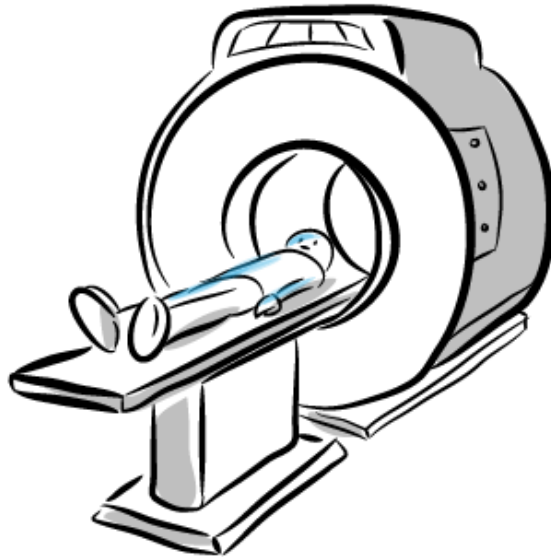
A few years ago

at the University of Southern California's

Brain and Creativity Institute

DRIFT AND CREATIVITY INSTITUTE,

a study was conducted where participants were placed into a MRI machine.



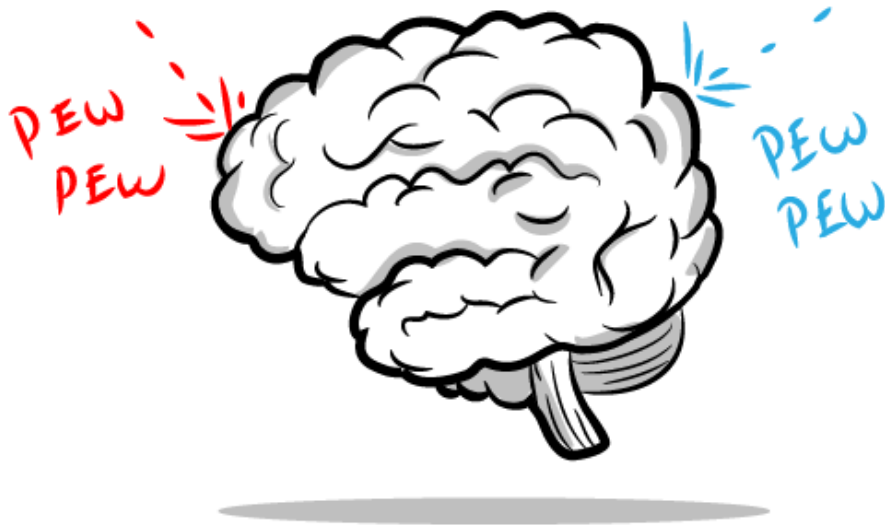
Once inside, they were presented with counterarguments to strongly held political beliefs.

A few examples:

"Laws restricting gun ownership should be made *more* restrictive."

"Gay marriage should not be legalized."

As participants were read these counterarguments, various parts of their brains were scanned for activity.



What the study revealed was that the part
of the brain that responds to a
PHYSICAL threat also responds to an
INTELLECTUAL one.

This area of the brain is known as the



and it's the emotional core of your mind.

Unfortunately,

it makes us biologically wired to react to
threatening information the same way we'd
react to being attacked by a predator.



THIS = THIS

From an evolutionary standpoint,
it makes sense.

If you were a caveman and another
caveman threw a boulder at your head,
you wouldn't react by logically debating the
pros and cons of getting brained.

FRANK JEALOUS OF JEFF'S NICE CAVE.
FRANK KILL JEFF AND TAKE CAVE.
GOODBYE JEFF.

Now Frank,
I think objectivity
is key here.

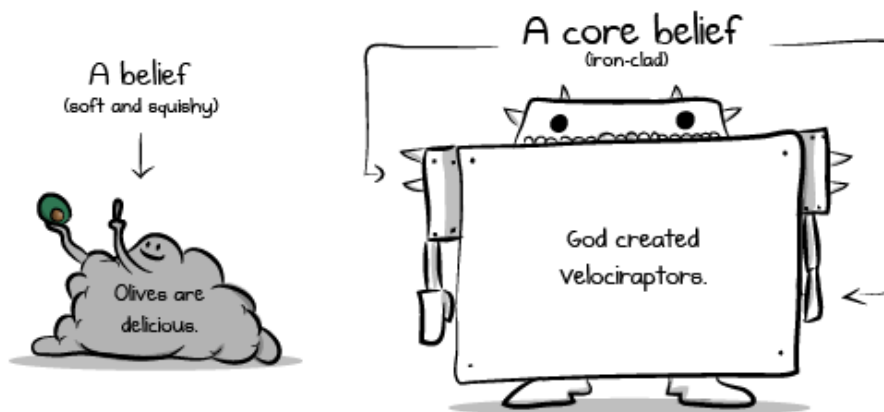


Core beliefs

are the beliefs which people
cherish the most deeply.

They usually develop from childhood and are
compounded by life experiences.

Core beliefs are inflexible, rigid,
and incredibly sensitive to being challenged.



When I told you that George Washington's dentures were made from animal bones, it probably didn't ruffle many feathers.

But when I suggested they were made from slave teeth, I'm guessing it caused strife with some of you.



There are obvious cultural reasons for this; slavery is a sensitive, hot-button issue.

But there are biological reasons as well: the amygdala of your brain is screaming "BATTLE STATIONS."

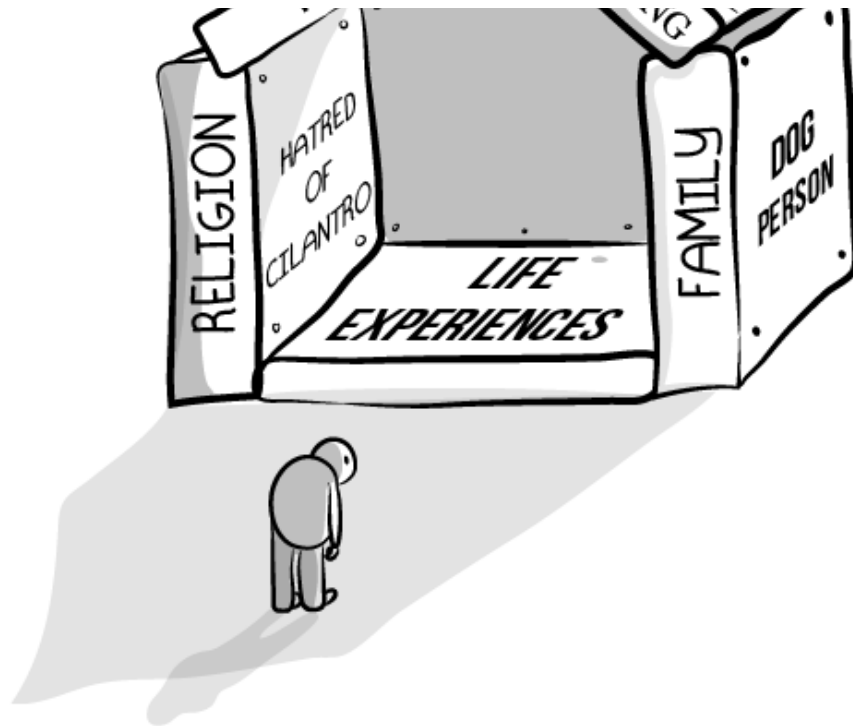


Some of you may have held a worldview that George Washington was a patriot and a hero. By presenting negative information about him, it challenged that worldview.

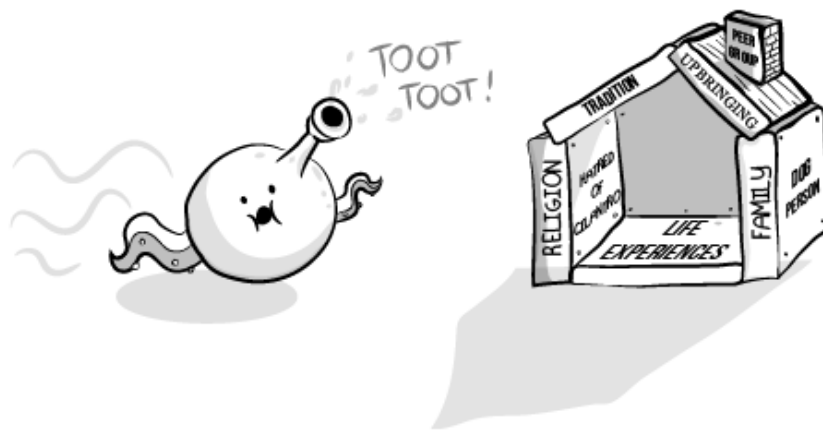
Your brain loves consistency.
It builds a worldview like we build a house.

It has a foundation and a frame and windows and doors and it knows exactly how everything fits together.





If new piece is introduced and it doesn't fit,

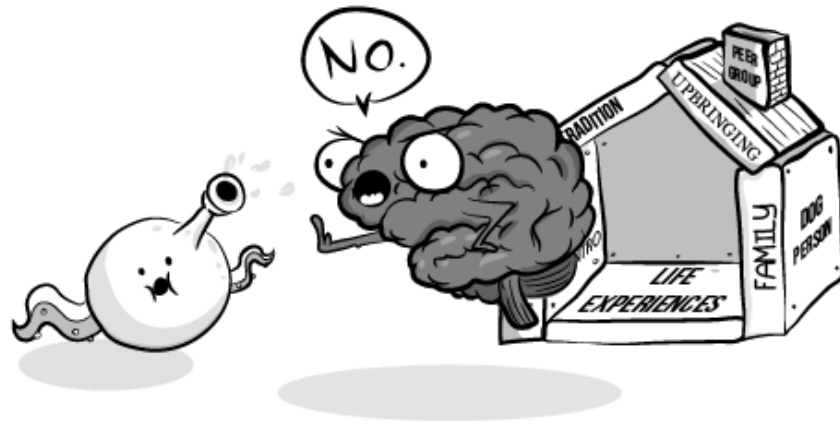


the whole house falls apart.

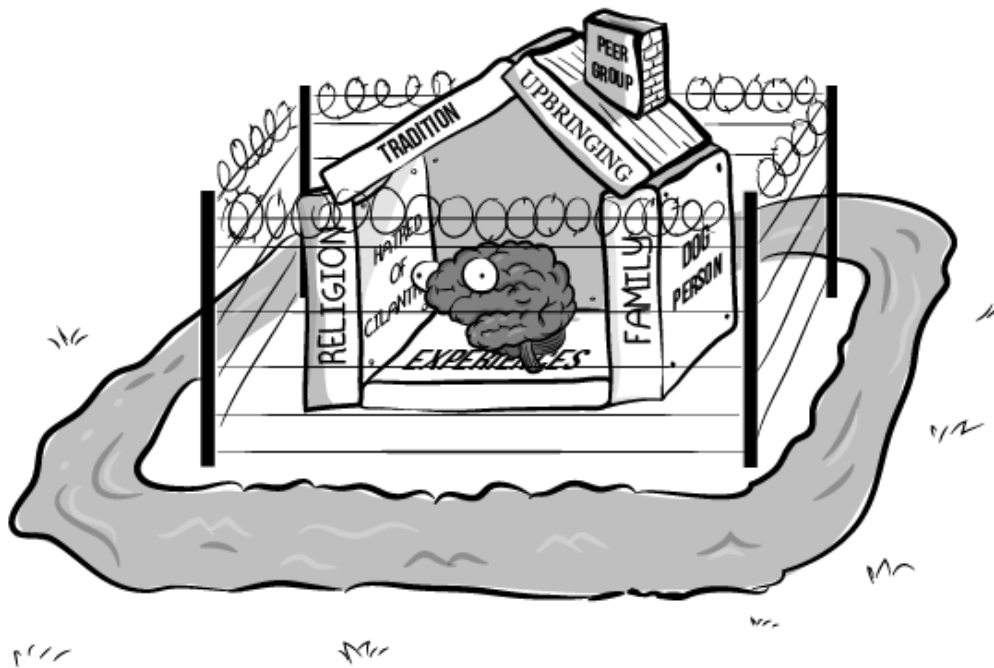


Your brain protects you by rejecting that piece

your brain protects you by rejecting that piece.



It then builds a fence and a moat and refuses to let in any visitors.



This is why we have the backfire effect.
It's a biological way of protecting a worldview.

Just remember that your worldview

isn't a perfect house that was built
to last forever.

It's a cheap condo,
and over time most of it will fall apart.



So,

what do we do about this?

Some of you have probably been nodding
along in agreement, waiting for me to
deliver a series of clever, combative ways
to offset the backfire effect.

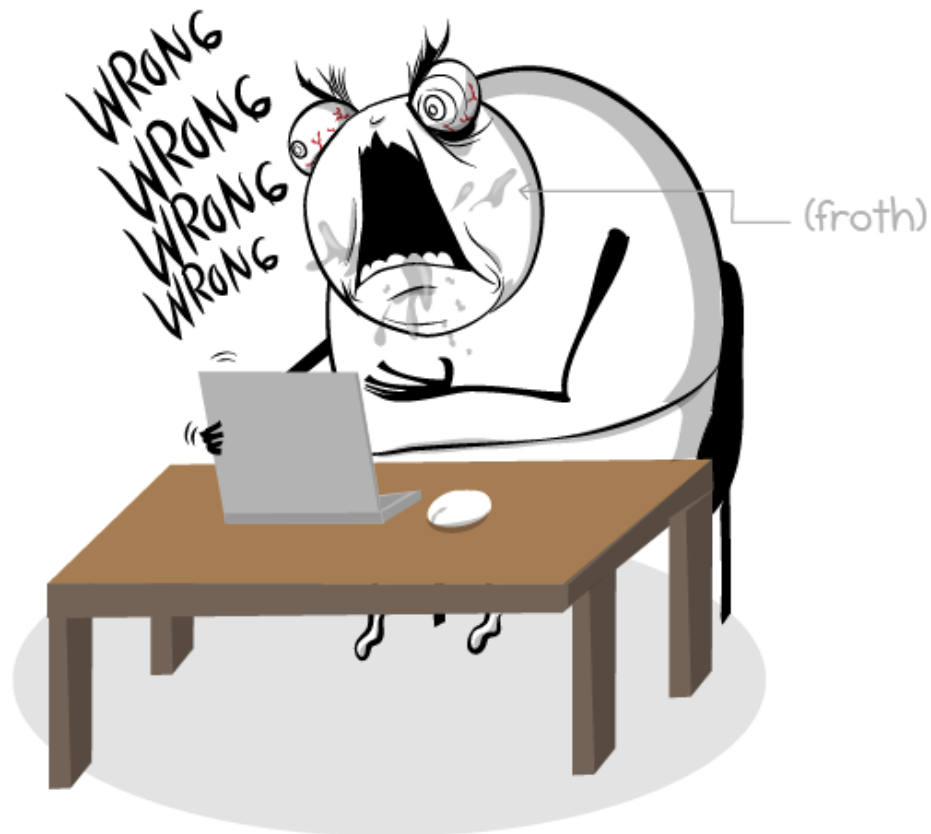
The disappointing truth is that I don't
have much advice for you.

I don't have a way to change the behavior of
seven-point-five billion people
carrying their beliefs around like precious gems
wrapped in hand grenades.



Sure, there are ways of changing people's
minds that are more effective than others,
but ultimately they all fall short.

This is compounded by the internet, where anything can be cited as a source and every disagreement degrades into a room full of orangutans throwing feces at one another.



The best I can do is make you aware of it,
so you can identify the backfire effect
in your own brain.

Which isn't easy. The mind can't separate
the **emotional cortex** from the **logical one**.



And one could argue that this
emotional underbelly is what
makes us human.

But I would argue that it's also
what makes us animals.



I sometimes pretend the amygdala of my brain is in my pinky toe.



When a core belief is challenged,
I imagine it yelling insane things at me.



I let it yell.



I let it have its moment.

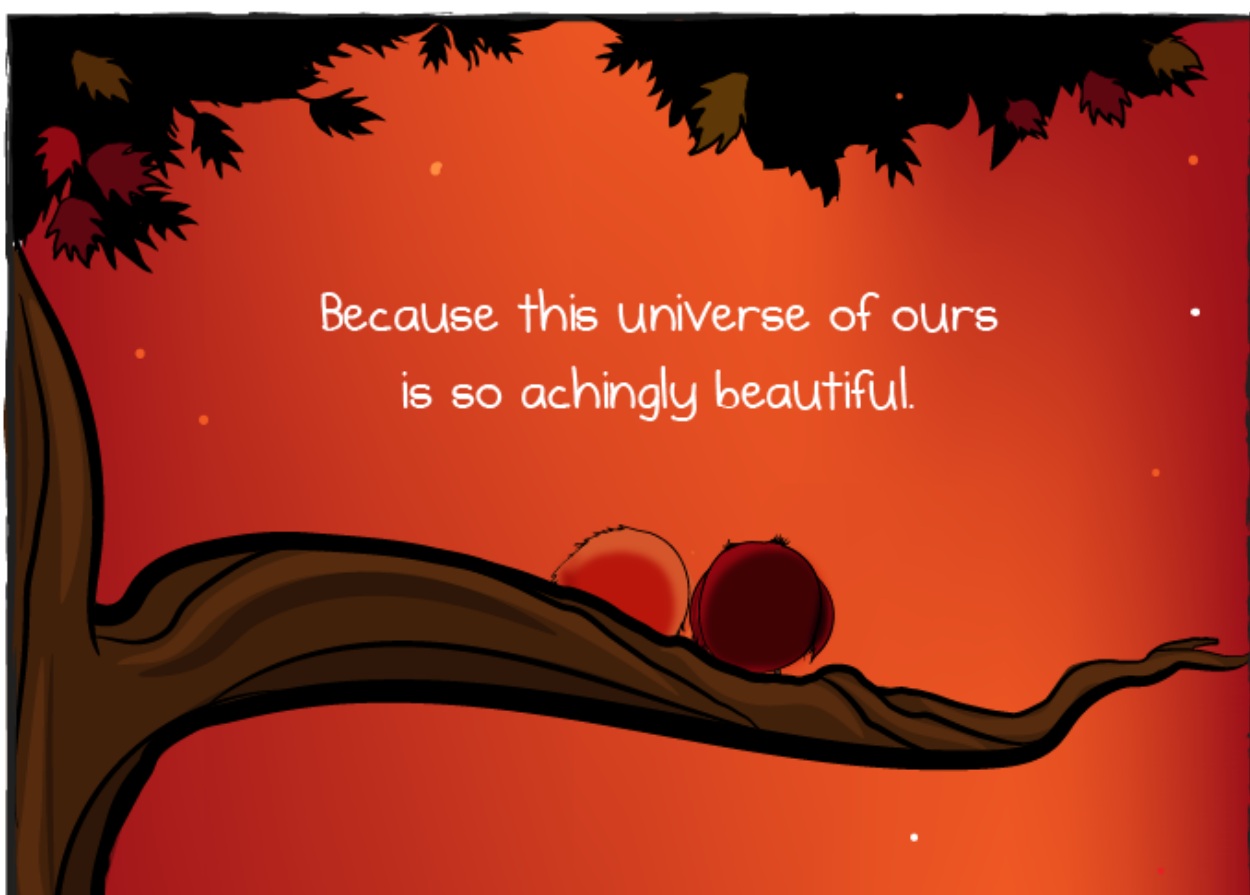
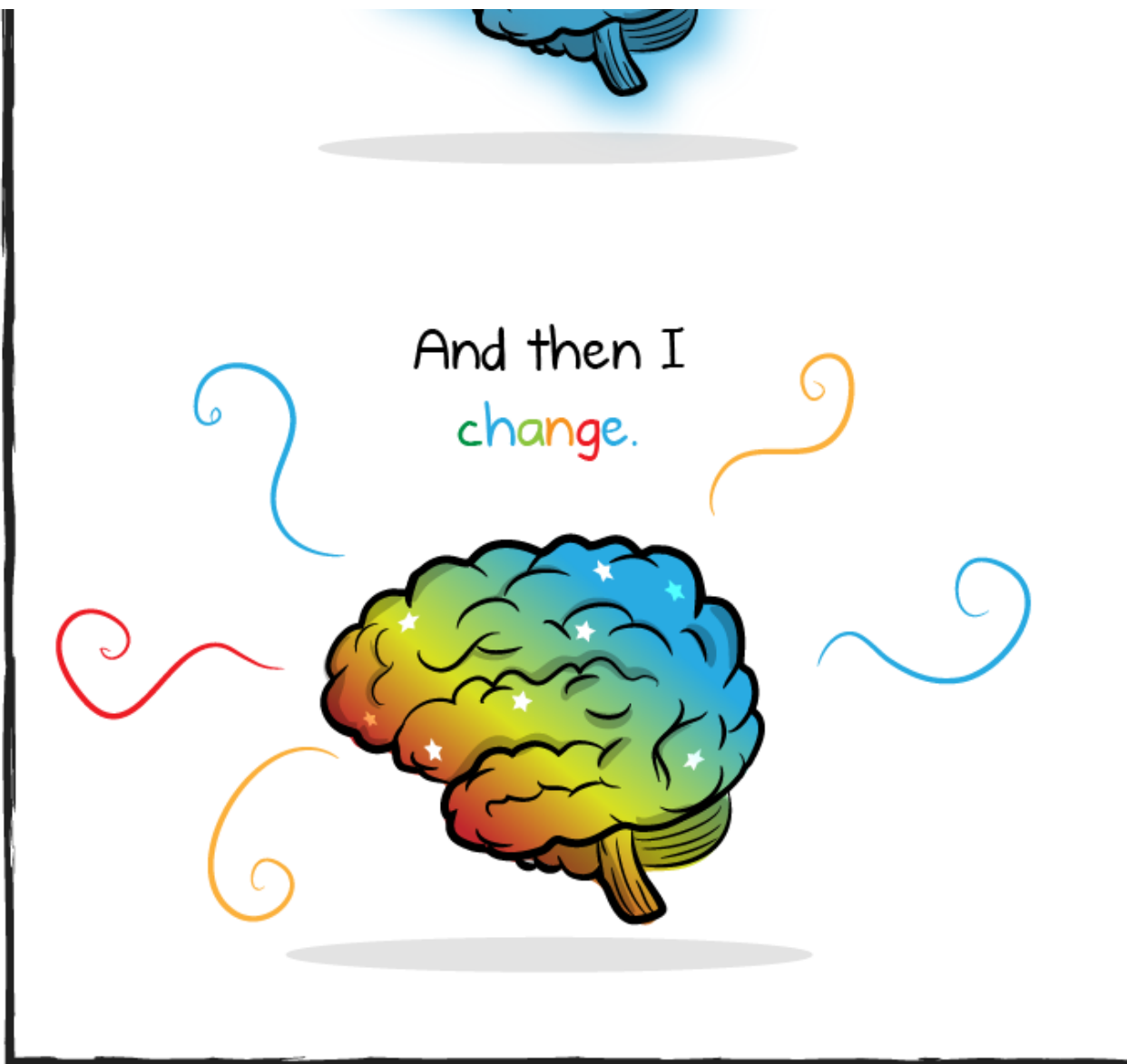


I let the emotional cortex
fight its little fight.



And then I **listen**.







And we're all in it together.

We're all going in
the same direction.

I'm not here to take
control of the wheel.



I'm just here to tell you
that it's okay to stop.

To listen.





Inspiration

This comic was inspired by this three-part series on the **backfire effect** (<https://youarenotsosmart.com/2017/01/13/yanss-093-the-neuroscience-of-changing-your-mind/>) from the **You Are Not So Smart Podcast** (<https://youarenotsosmart.com/>).

If you want to learn more about the backfire effect and other related behaviors (confirmation bias, deductive reasoning, etc), I **highly** recommend listening to the whole thing:

Podcast Part 1 (<https://youarenotsosmart.com/2017/01/13/yanss-093-the-neuroscience-of-changing-your-mind/>) - **Podcast Part 2** (<https://youarenotsosmart.com/2017/01/30/yanss-094-how-motivated-skepticism-strengthens-incorrect-beliefs/>) - **Podcast Part 3** (<https://youarenotsosmart.com/2017/02/11/yanss-095-how-to-fight-back-against-the-backfire-effect/>)

I would also like to thank my wonderful girlfriend **Theresea**

(<https://www.instagram.com/idomakelove/>) for calling my attention to the backfire effect in the first place. The past year has been rough for a lot of people, and she pointed me in a direction that could actually *help* people. There sea: you're amazing, I love you, thank you.

USC Creativity and Brain Institute

Neural correlates of maintaining one's political beliefs in the face of counterevidence

(<https://www.nature.com/articles/srep39589>)

By Sarah Gimbel and Sam Harris.

Other fun reading

Reddit - Change My View (<https://www.reddit.com/r/changemyview/>)

Wikipedia's list of common misconceptions

(https://en.wikipedia.org/wiki/List_of_common_misconceptions)

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Wooden teeth

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https://en.wikipedia.org/wiki/Housefly#Life_cycle (https://en.wikipedia.org/wiki/Housefly#Life_cycle)

Exploding in a vacuum

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[url=http%3A%2F%2Fimagine.gsfc.nasa.gov%2Fdocs%2Fask_astro%2Fanswers%2F970603.html](http%3A%2F%2Fimagine.gsfc.nasa.gov%2Fdocs%2Fask_astro%2Fanswers%2F970603.html)
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Jesus's birthday <https://www.ucg.org/the-good-news/biblical...> (<https://www.ucg.org/the-good-news/biblical-evidence-shows-jesus-christ-wasnt-born-on-dec-25>)
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Roe v. Wade

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https://en.wikipedia.org/wiki/Roe_v._Wade#Supreme_Court_decision
https://en.wikipedia.org/wiki/Roe_v._Wade#Supreme_Court_decision
<http://www.u-s-history.com/pages/h2603.html> (<http://www.u-s-history.com/pages/h2603.html>)

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going to believe
what I'm about
to tell you.



(/comics/believe)

I need 50,000
comments on a
government website.



(/blog/grizzlies_north_cascades)



(http://theoatmeal.com/catapp)



(/comics/toot)

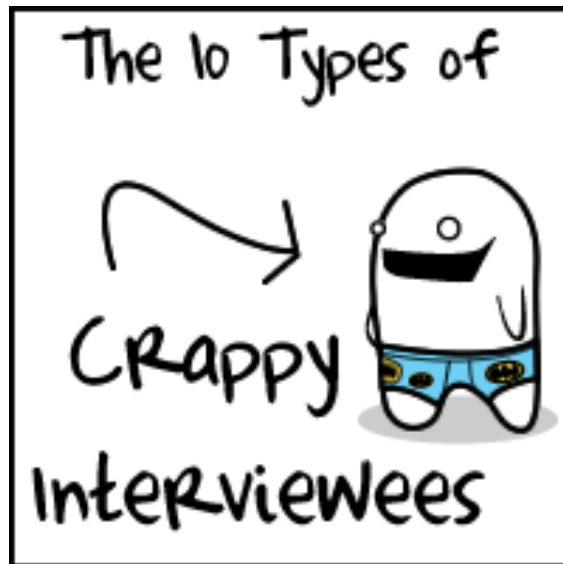


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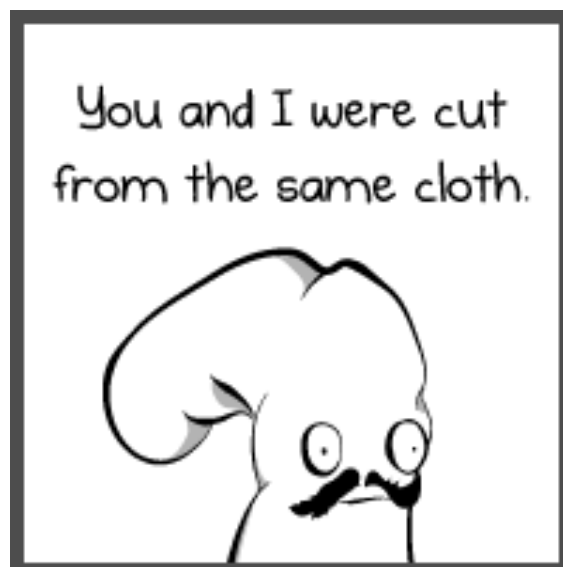
Battery
Drain

(/comics/battery_drain)





(/comics/interviewees)



(/comics/same_cloth)



(/comics/movie_dogs)



(/comics/abortion_clinic)

How to be
perfectly
unhappy.

(/comics/unhappy)



THERE'S A HERO
INSIDE ALL OF US.

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(/comics/hero)





(/blog/floss)



The evolution
of our

(/comics/food)



spines
and
speech

(/comics/spines_speech)



(/comics/bananus)

TEN WAYS
TO BEFRIEND
A MISANTHROPIC CAT.



HOW TO HOLD A BABY WHEN YOU ARE NOT USED TO HOLDING BABIES.

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HOW LONG COULD
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