

# How to do (Open\*) Science

\*what we call it now...



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# What is Science?

**SYSTEMATIC ENTERPRISE  
THAT BUILDS AND ORGANIZES  
KNOWLEDGE**

**IN THE FORM OF TESTABLE  
EXPLANATIONS  
AND PREDICTIONS ABOUT THE  
UNIVERSE.**

THE PROBLEM WITH SCIENTISTS IS THAT YOU TAKE THE WONDER AND BEAUTY OUT OF EVERYTHING BY TRYING TO ANALYZE IT.

DUDE!

MY PLASMODIAL SLIME MOLODS HAVE HEIGHTENED PIGMENT PRODUCTION! CHECK OUT THAT YELLOW COLOR! THAT ACTUALLY MAKES THEM ZINC-RESISTANT. AMAZING, HUH?

IT LOOKS LIKE DOG BARF.

HAH, YEAH! F. SEPTICA IS NICKNAMED "DOG VOMIT SLIME MOLD." COOL, HUH? CHECK OUT MY SUDES!

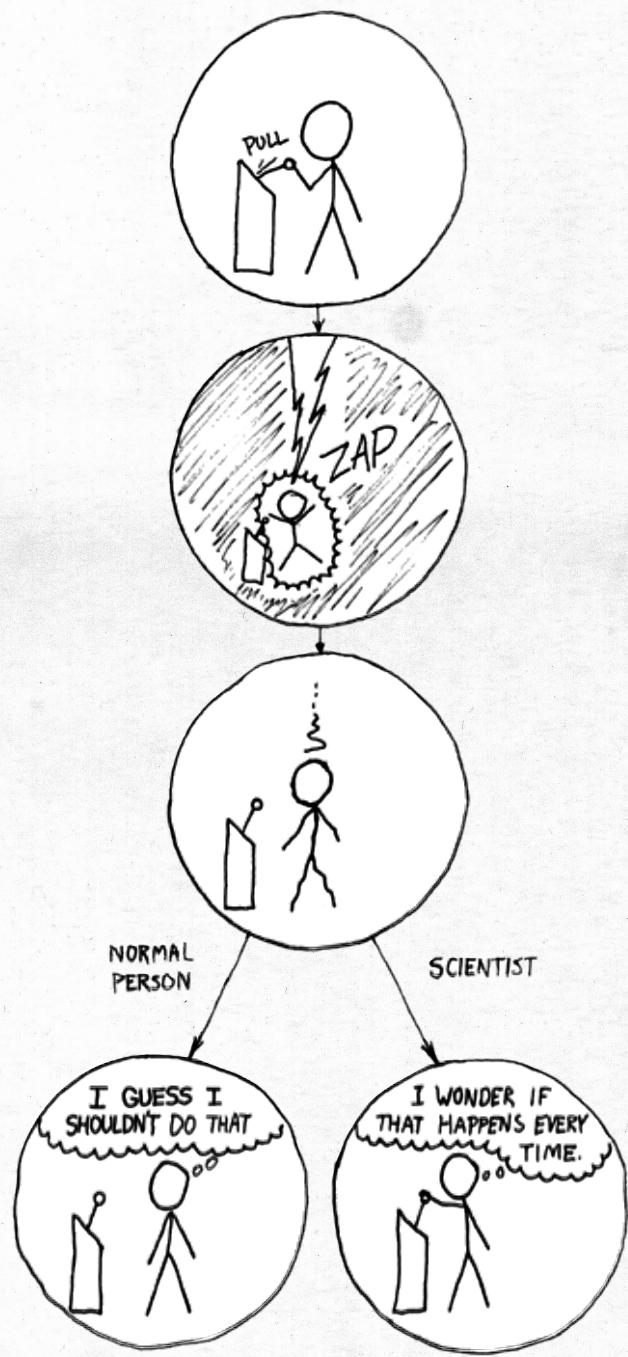
OKAY, NEVER MIND: WHAT'S WRONG WITH SCIENTISTS IS THAT YOU DO SEE WONDER AND BEAUTY IN EVERYTHING.

OH GOD, IT'S MOVING!

IT WANTS TO HUG YOU! SO CUTE!

# Testable is key!

THIS MEANS THAT WE CAN  
REPEAT AN EXPERIMENT AND  
EXPECT THE SAME RESULT.



# GIVEN THE SAME CONDITIONS... HAVING ACCESS TO ALL THE INFORMATION TO REPLICATE AN EXPERIMENT IS HARD.

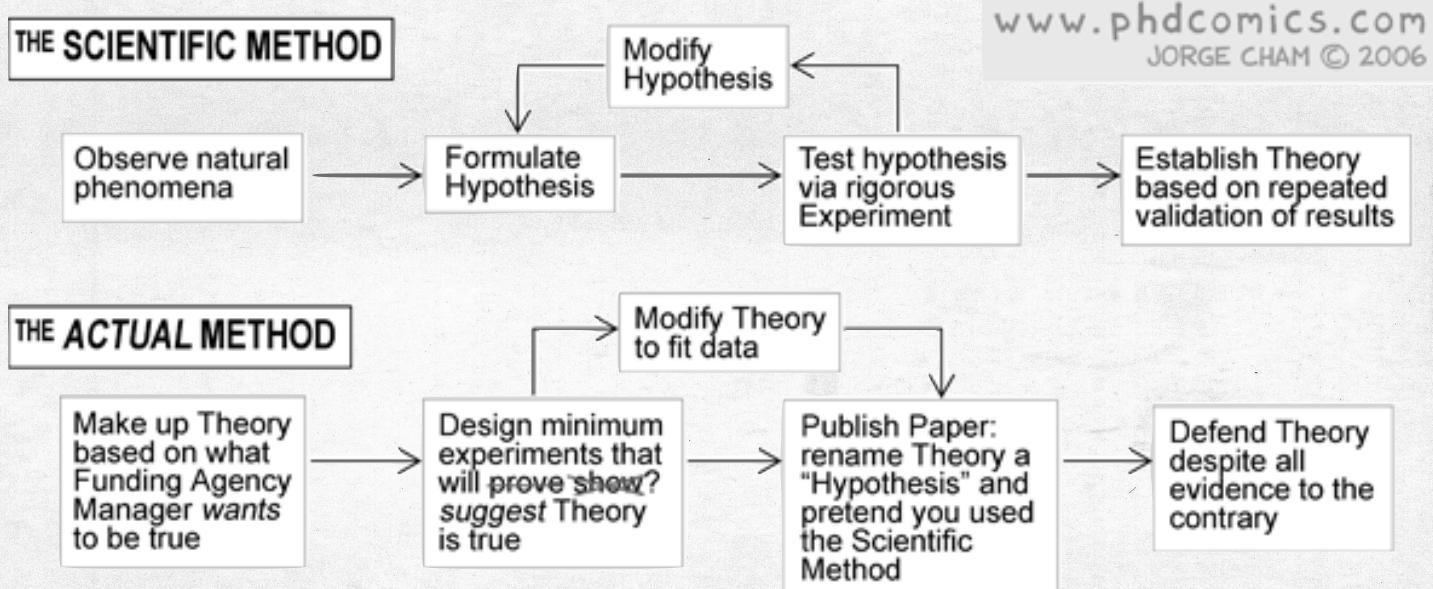


A LOT OF RESEARCH IS PUBLISHED IN  
CLOSED ACCESS JOURNALS

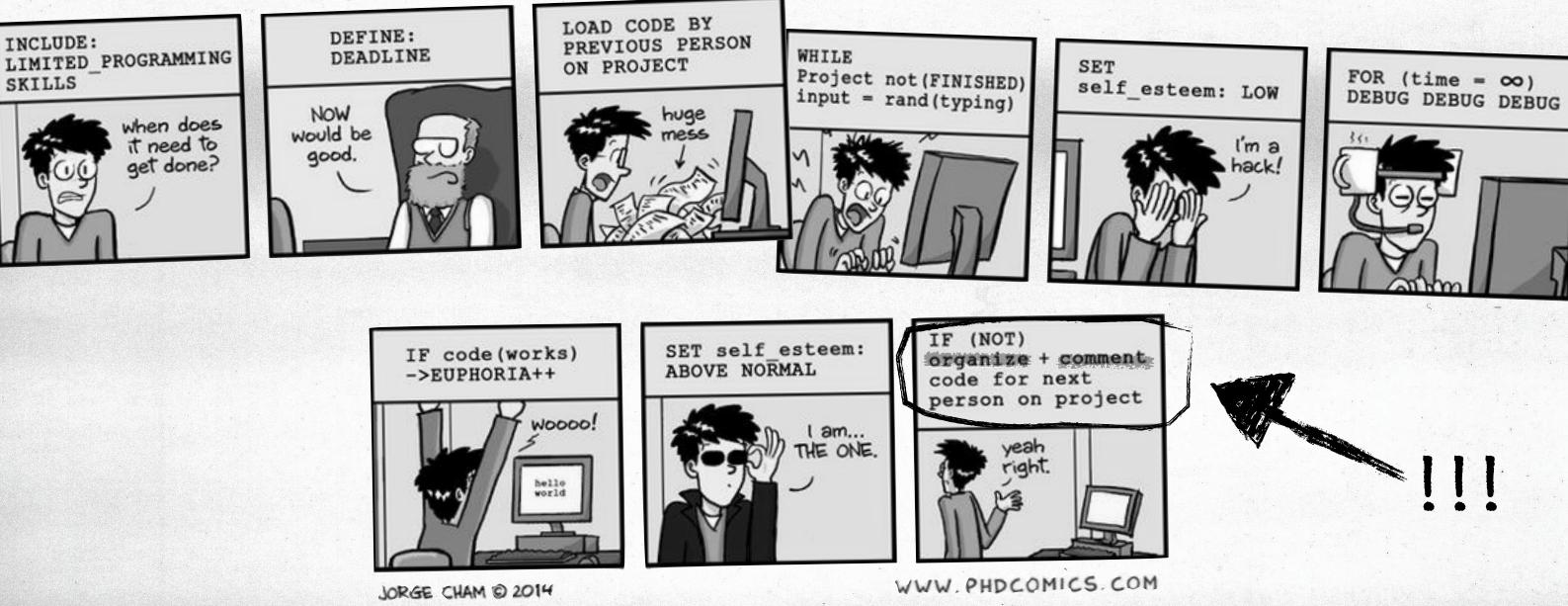
# Closed Science

THERE IS LITTLE MOTIVATION TO RELEASE ALL THE DATA, CODE, DOCUMENTATION

INCENTIVES ARE TO PUBLISH NEW AND HYPED RESULTS IN GLAMOUR JOURNALS



## PROGRAMMING FOR NON-PROGRAMMERS



**AND WE ARE LOOSING KNOWLEDGE FAST...**

# **Most Scientific Research Data From the 1990s Is Lost Forever**

A new study has found that as much as 80 percent of the raw scientific data collected by researchers in the early 1990s is gone forever, mostly because no one knows where to find it.

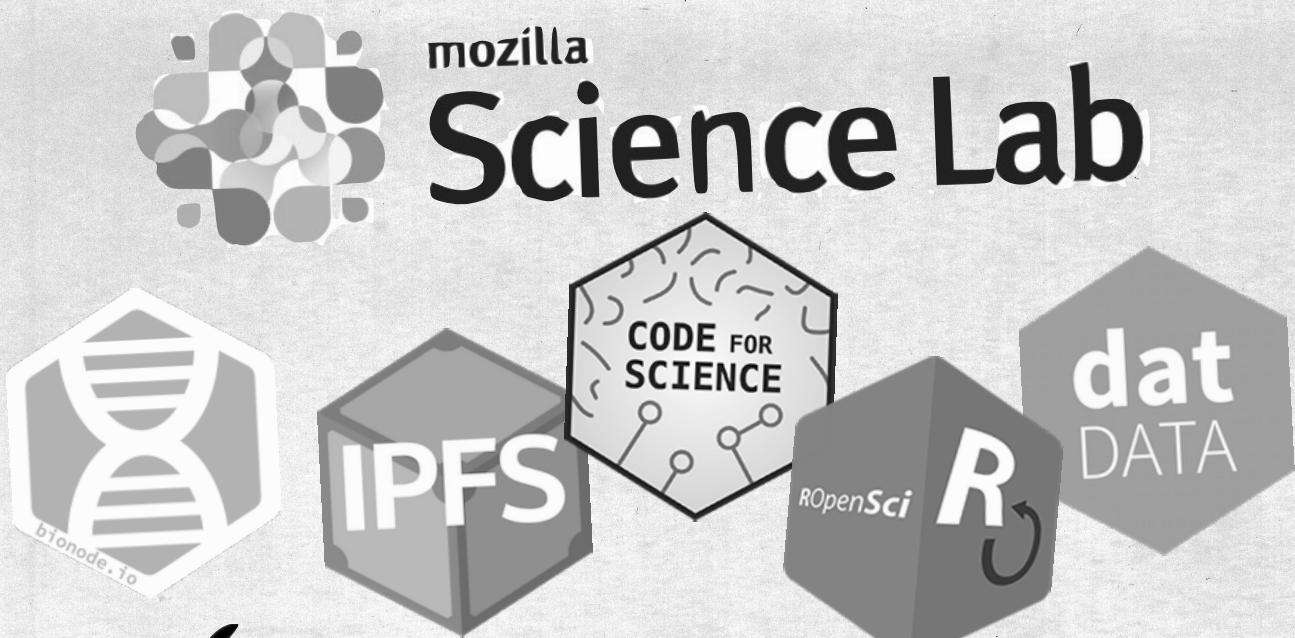


**THIS IS NOT A TECHNOLOGICAL  
PROBLEM, IT'S AN INCENTIVES AND  
SCIENTIFIC CULTURE PROBLEM**

# How to change this

- Make scientist and funders care!
- Release your code, data, docs on GitHub.com, figshare.com, etc...
- Use Open licenses  
check choosealicense.com and creativecommons.org
- Publish open access, use preprint servers arxiv.org, biorxiv.org, etc...
- Be more informed about this

## PEOPLE CHANGING IT



software carpentry

# **STAND BACK**



# **I'M GOING TO TRY SCIENCE**

A C F H O W V I E D G R E E N Y

## **MOZILLA SCIENCE LAB**

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