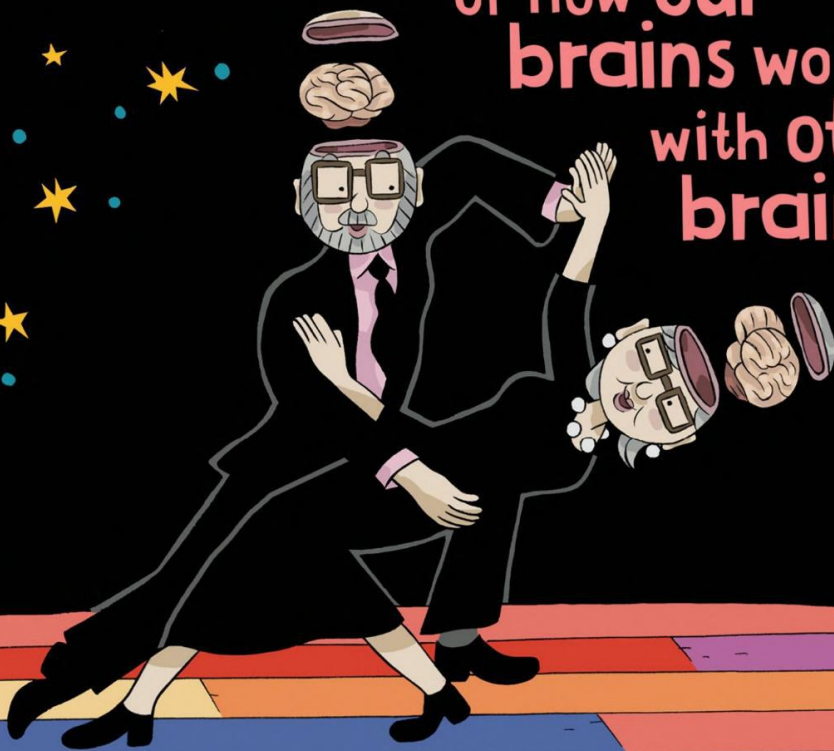


UTA FRITH, CHRIS FRITH, AND ALEX FRITH  
ILLUSTRATIONS BY DANIEL LOCKE

# Two Heads

A graphic exploration  
of how **our**  
**brains** work  
with other  
**brains**





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1230 AVENUE OF THE AMERICAS  
NEW YORK, NY 10020

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FIRST SCRIBNER HARDCOVER EDITION APRIL 2022

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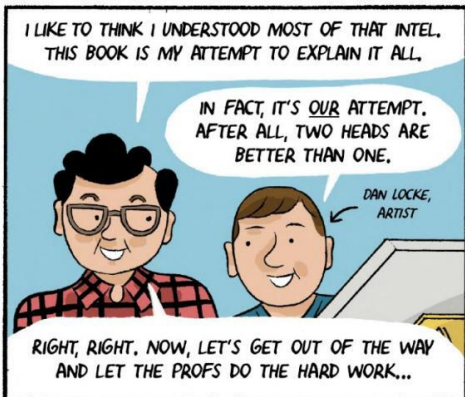
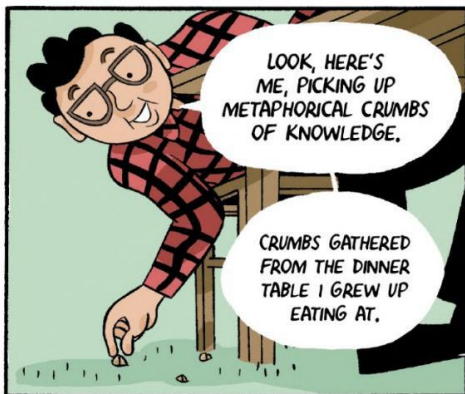
LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA IS AVAILABLE.

ISBN 978-1-5011-9401-8  
ISBN 978-1-5011-9409-2 (EBOOK)

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LOOK, HERE THEY ARE NOW. LET'S FOLLOW THEM INTO THEIR HOME, IN NORTH WEST LONDON, WHERE THEY'VE LIVED FOR MORE THAN 30 YEARS.





UTA FRITH,  
NÉE AURNHAMMER  
(1941 - ?)

CHRIS FRITH,  
(1942 - ?)



WELCOME TO OUR HOME. I EXPECT YOU'VE ALREADY NOTICED SOMETHING; LIKE ALL GOOD ACADEMICS, WE SURROUND OURSELVES WITH CLUTTER, ESPECIALLY ART.

THAT'S PART OF THE REASON WHY THIS BOOK IS A COMIC.

INDEED, NOW, THIS DOOR LEADS TO MY STUDY. COME WITH ME AND WE CAN BEGIN OUR JOURNEY INTO THE WONDERS OF THE HUMAN BRAIN, THE MOST SOCIAL OF ALL OUR ORGANS.

INVITATION TO A PARTY  
(IT'S IN THE EPILOGUE)



CAN YOU SPOT ALL THE BRAINS HIDDEN IN THIS PROLOGUE?

MORE CARPETS THAN FLOOR SPACE



WALLS COVERED WITH ART...

...MOSTLY ABSTRACT

HIGH-END CHRISTMAS DECORATIONS

BUT FIRST, A QUICK VISIT TO MY STUDY, UP THESE STAIRS...

MORE WINE BOTTLES THAN CAN REALISTICALLY BE DRUNK

LADDER TO REACH BOOKS

TOWERING BOOKSHELVES LOOM JUST OUT OF SIGHT...



PROFESSOR FRITH'S\* STUDY



I'VE BEEN A RESEARCH PSYCHOLOGIST SINCE THE 1960S, FOR MANY YEARS I STUDIED SCHIZOPHRENIA, BEFORE TURNING MY ATTENTION TO BRAIN SCANNING.



PILE OF COMICS RECOMMENDED BY SON (READ)



PILE OF WORK-RELATED PAPERS TO REVIEW (NOT READ)

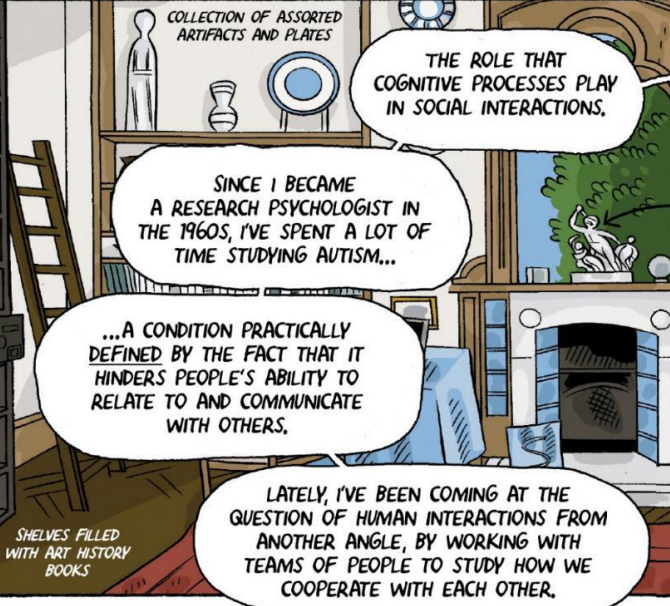


STANDING DESK

PROFESSOR FRITH'S\* STUDY



\*MAKE A GENDER-BASED NAME DISTINCTION AT YOUR PERIL!



COLLECTION OF ASSORTED ARTIFACTS AND PLATES

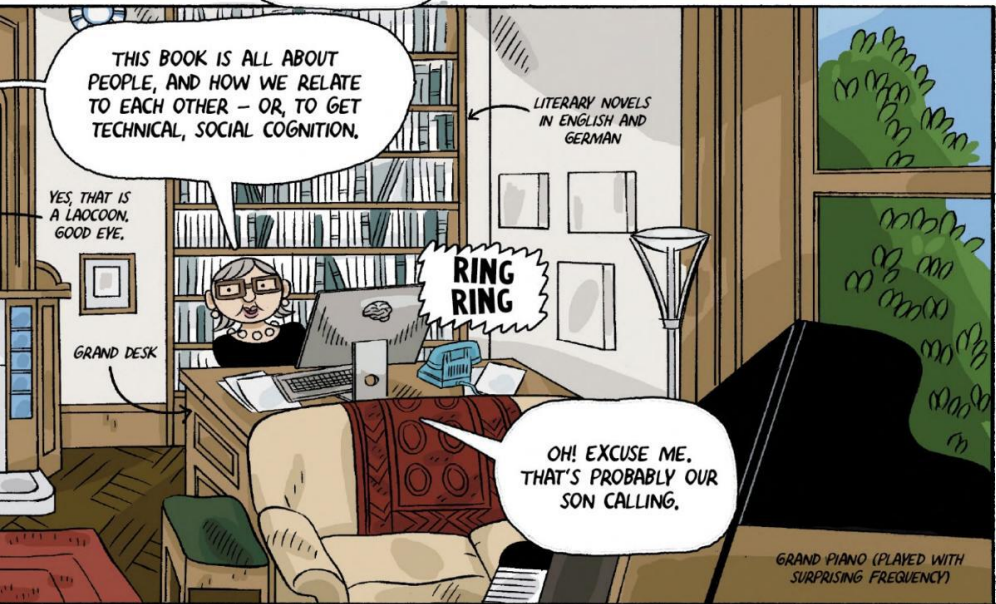
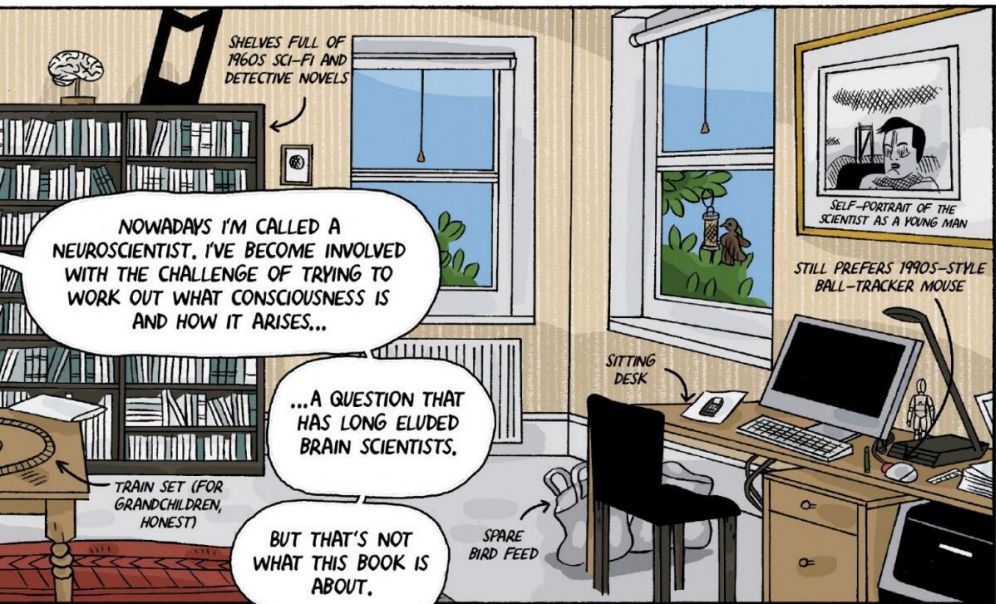
SHELVES FILLED WITH ART HISTORY BOOKS

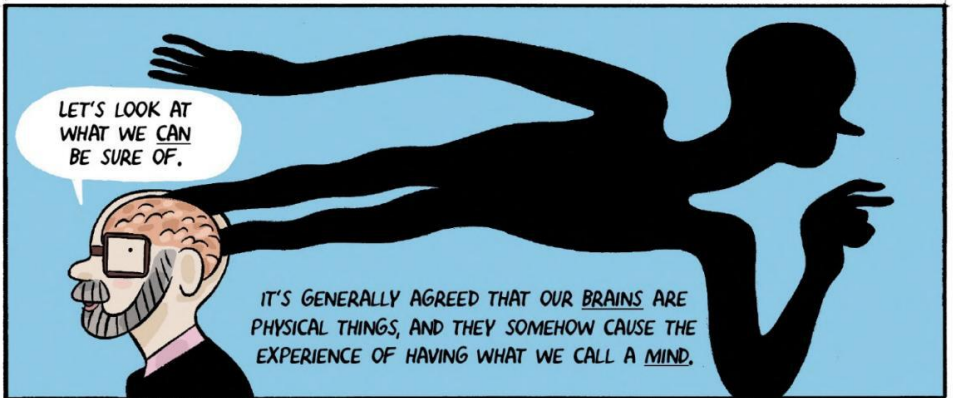
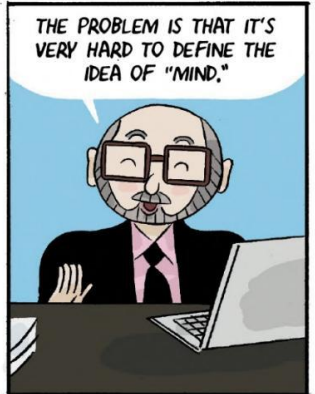
THE ROLE THAT COGNITIVE PROCESSES PLAY IN SOCIAL INTERACTIONS.

SINCE I BECAME A RESEARCH PSYCHOLOGIST IN THE 1960S, I'VE SPENT A LOT OF TIME STUDYING AUTISM...

...A CONDITION PRACTICALLY DEFINED BY THE FACT THAT IT HINDERS PEOPLE'S ABILITY TO RELATE TO AND COMMUNICATE WITH OTHERS.

LATELY, I'VE BEEN COMING AT THE QUESTION OF HUMAN INTERACTIONS FROM ANOTHER ANGLE, BY WORKING WITH TEAMS OF PEOPLE TO STUDY HOW WE COOPERATE WITH EACH OTHER.

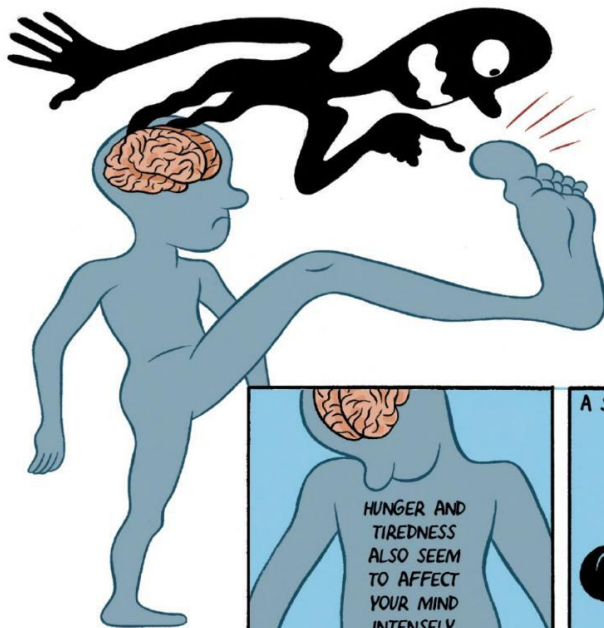




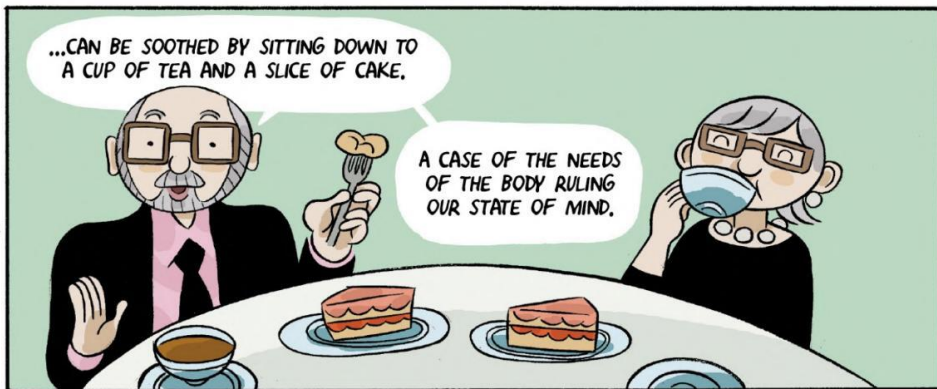
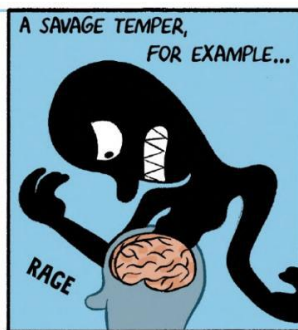
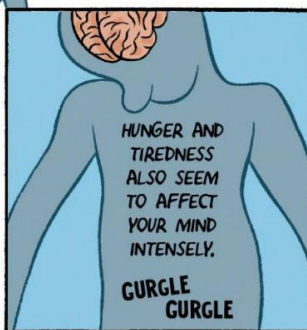
MORE THAN THAT, THE MIND IS AFFECTED BY THE WHOLE BODY, NOT JUST THE BRAIN.

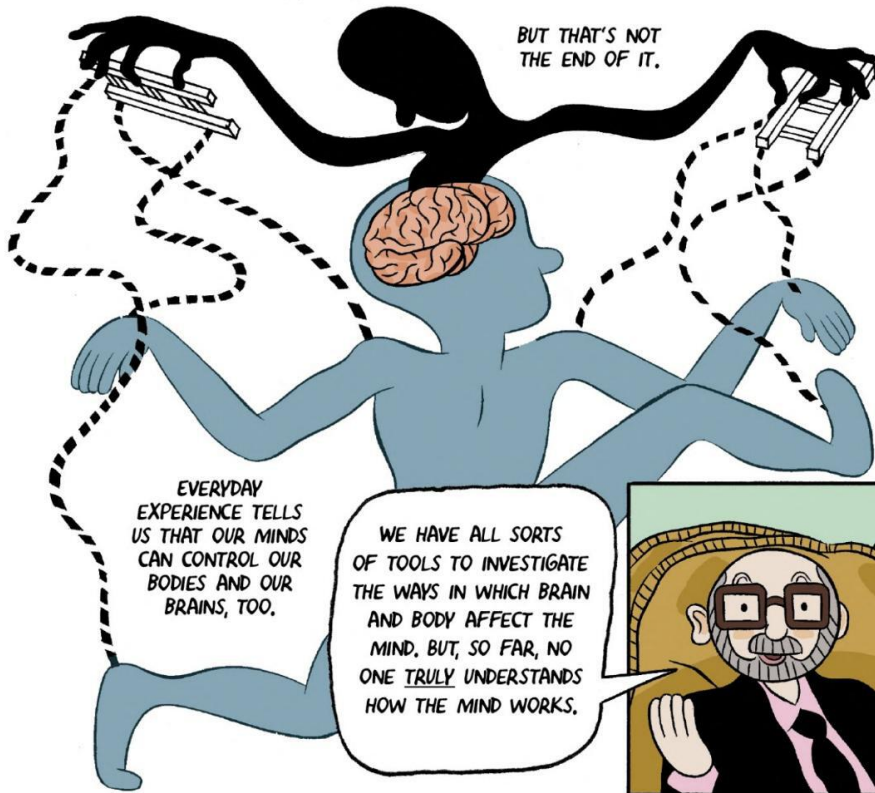
FOR INSTANCE, IMAGINE YOU'VE JUST STUBBED A TOE.

1) YOUR BRAIN SIMPLY REGISTERS PAIN, BUT CARRIES ON WITH ITS OTHER BUSINESSES.



2) YOUR MIND IS, FOR A MOMENT, ABSOLUTELY OVERWHELMED BY THE SENSATION, AND YOU FEEL YOU CAN BARELY FUNCTION.

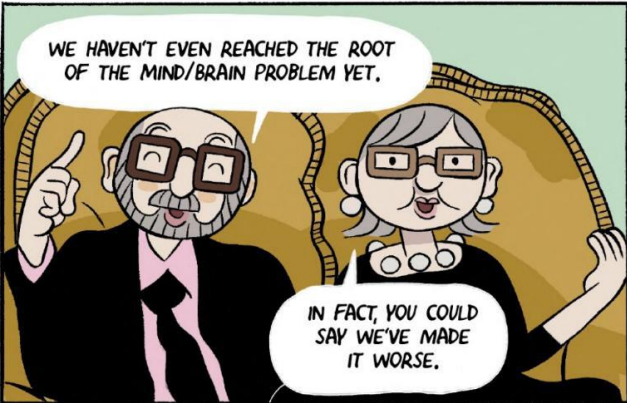




BUT THAT'S NOT THE END OF IT.

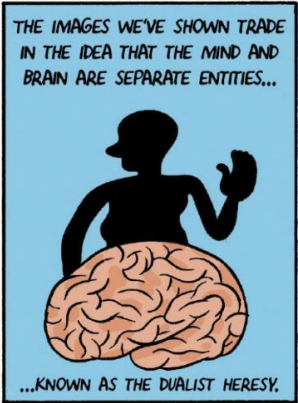
EVERYDAY EXPERIENCE TELLS US THAT OUR MINDS CAN CONTROL OUR BODIES AND OUR BRAINS, TOO.

WE HAVE ALL SORTS OF TOOLS TO INVESTIGATE THE WAYS IN WHICH BRAIN AND BODY AFFECT THE MIND. BUT, SO FAR, NO ONE TRULY UNDERSTANDS HOW THE MIND WORKS.



WE HAVEN'T EVEN REACHED THE ROOT OF THE MIND/BRAIN PROBLEM YET.

IN FACT, YOU COULD SAY WE'VE MADE IT WORSE.



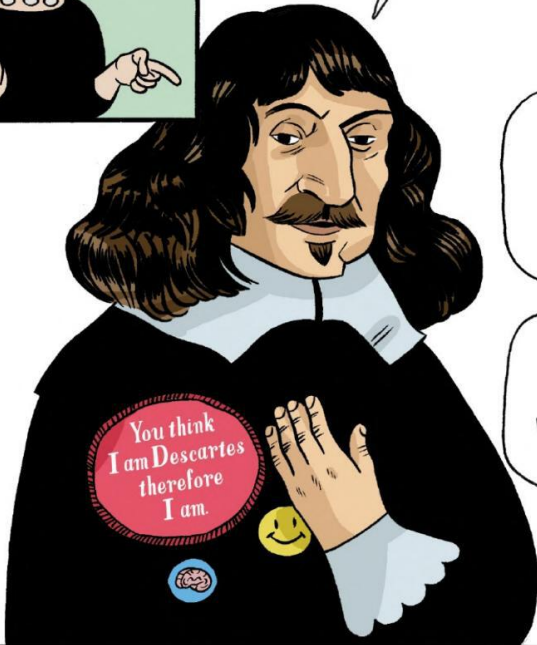
THE IMAGES WE'VE SHOWN TRADE IN THE IDEA THAT THE MIND AND BRAIN ARE SEPARATE ENTITIES...

...KNOWN AS THE DUALIST HERESY.

THIS "HERESY" GOES BACK TO ANTIQUITY, BUT WAS MOST FAMOUSLY ARTICULATED BY RENÉ DESCARTES IN THE 17TH CENTURY.



IT IS CERTAIN THAT I AM REALLY DISTINCT FROM MY BODY, AND CAN EXIST WITHOUT IT.



SCIENCE SAYS HE IS WRONG, WRONG WRONG! IF ANYTHING, HE GOT IT BACKWARDS.\*



ALL AVAILABLE EVIDENCE SAYS THAT THE SENSATION YOU CALL "YOU" – ROUGHLY EQUIVALENT TO YOUR MIND – ABSOLUTELY COULD NOT AND WOULD NOT EXIST WITHOUT YOUR BRAIN.

NOW, BEFORE WE GET INTO OUR STORY ABOUT HOW BRAINS COOPERATE WITH EACH OTHER, WE'RE GOING TO GO OVER SOME BRAIN BASICS NICE AND QUICKLY.

THE THINGS WE DO KNOW, THAT IS, DON'T WORRY, WE'LL KEEP IT SIMPLE...

\*ALTHOUGH I WILL SAY, IN A FOOTNOTE, THAT DESCARTES WASN'T LITERALLY TALKING ABOUT HUMAN PHYSIOLOGY, HE WAS FOCUSED INSTEAD ON A SEMANTIC ARGUMENT ABOUT "THINGS IN THEMSELVES."



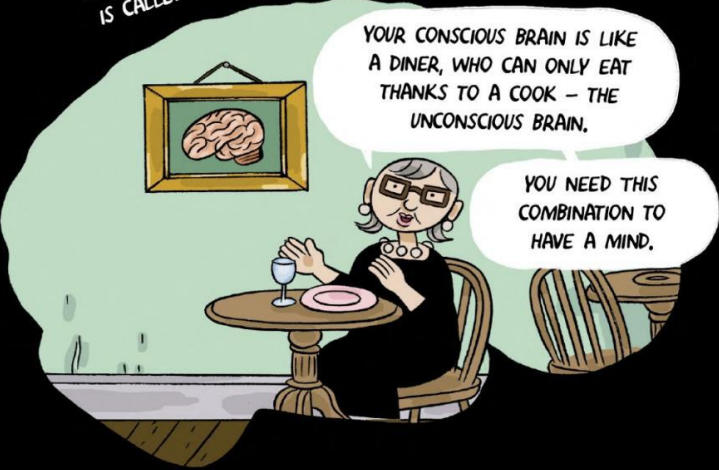
AND I DON'T WANT TO BE TOO HARSH ON OLD RENÉ EITHER – THE DUALIST HERESY COMES NATURALLY TO ALL OF US.

BE WARNED – PLENTY MORE FOOTNOTES TO COME IN THIS BOOK!



# Chapter 1

ONE OF OUR FAVORITE BRAIN ANALOGIES IS CALLED "THE COOK AND THE DINER."



YOUR CONSCIOUS BRAIN IS LIKE A DINER, WHO CAN ONLY EAT THANKS TO A COOK – THE UNCONSCIOUS BRAIN.

YOU NEED THIS COMBINATION TO HAVE A MIND.

What your brain is,  
what it can do,

THIS RELATIONSHIP HAPPENS IN EVERY INDIVIDUAL'S BRAIN. (NOT TO MENTION IN SOME HOUSEHOLDS.)

YOU MIGHT THINK WE'RE SAYING THAT THE DINER IS IN CHARGE...

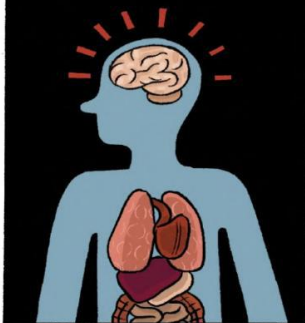


...BUT THAT'S NOT THE CASE. AS WE'LL SEE, EACH PART OF YOUR BRAIN IS MADE OF THE SAME STUFF, AND IT ALL WORKS IN THE SAME WAY.

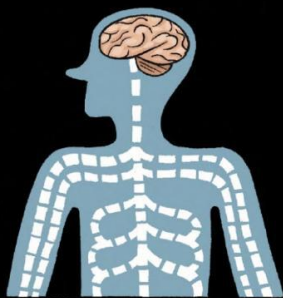
how it works,  
and all that.



**LESSON 1:  
WHAT THE BRAIN DOES**



**THE BRAIN IS THE  
CONTROL HUB OF THE  
BODY'S NERVOUS SYSTEM.**



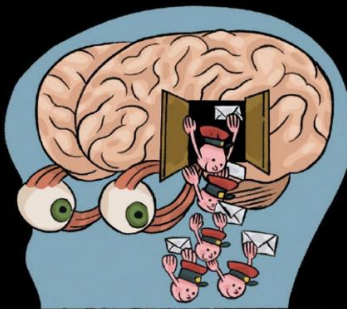
**IT SENDS AND  
RECEIVES SIGNALS  
FROM ALL OVER  
THE BODY.**



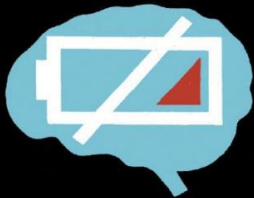
**THE VAST MAJORITY OF THESE  
SIGNALS ARE CONTAINED IN  
CHEMICAL MESSENGERS KNOWN  
AS NEUROTRANSMITTERS.**



**ON A BASIC LEVEL, MUCH OF YOUR BRAIN'S JOB IS TO CREATE  
AND MOVE AROUND THESE NEUROTRANSMITTERS.**



**TO FUNCTION, THE BRAIN  
NEEDS ENORMOUS AMOUNTS  
OF ENERGY...**



**...WHICH IS SUPPLIED BY A VAST NETWORK OF BLOOD VESSELS.**

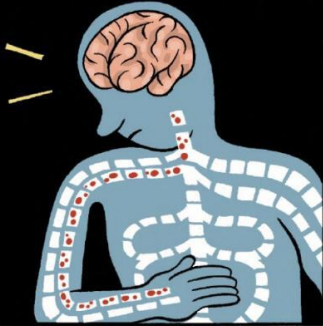


**NEARLY ONE-FIFTH OF ALL THE BLOOD IN YOUR BODY  
IS IN YOUR BRAIN AT ANY GIVEN MOMENT.**

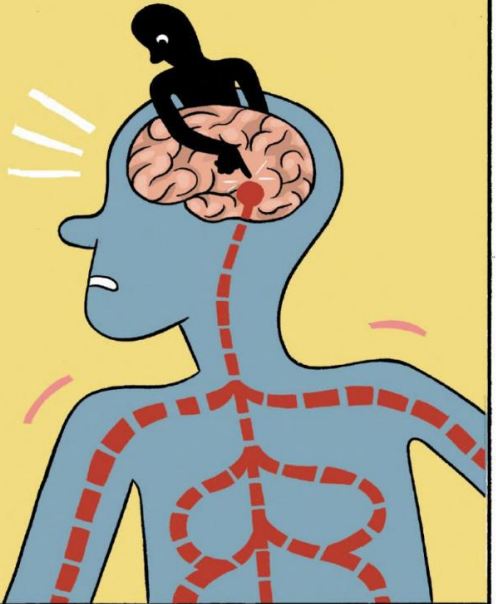


BLOOD ALSO CARRIES HORMONES TO AND FROM THE BRAIN.

HORMONES CONTROL ALL SORTS OF BODILY FUNCTIONS, SUCH AS HUNGER.



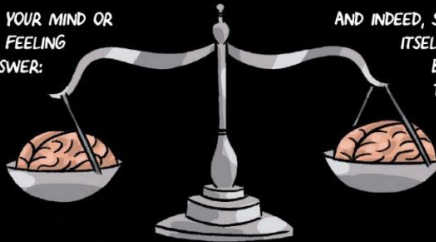
HORMONES OFTEN DETERMINE OUR EMOTIONS, TOO. SOMETIMES, THE TRIGGER TO RELEASE THEM SEEMS TO START IN YOUR "MIND." FOR EXAMPLE, WHEN YOU PERCEIVE A PROBLEM...



...YOUR BRAIN STARTS TO RELEASE HORMONES THAT RAISE YOUR STRESS LEVELS.

THIS IS YOUR BRAIN WORKING PROPERLY (UNPLEASANT THOUGH IT CAN BE).

THE QUESTION REMAINS, IS IT YOUR MIND OR YOUR BRAIN THAT CAUSES THE FEELING OF BEING STRESSED OUT? ANSWER: UNKNOWN.



AND INDEED, SOME WOULD SAY THE QUESTION ITSELF IS FAULTY – REMEMBER, OUR BEST GUESS AT THE MOMENT IS THAT THE MIND AND BRAIN ARE NOT SEPARATE ENTITIES!

LESSON 2:  
WHICH BRAIN PARTS MATTER

ONE VERY ANCIENT DISCOVERY ABOUT THE BRAIN IS THAT YOU DON'T NEED ALL OF IT TO SURVIVE.



YOU CAN LITERALLY HAVE MORE THAN HALF YOUR BRAIN REMOVED AND LIVE OUT A PRETTY NORMAL LIFE.



ONE PATIENT HAD ONLY BEEN ABLE TO SAY A SINGLE WORD...

TANI! TANI!

...THE OTHER JUST FIVE WORDS.

OUI,  
NON,  
TOIS,  
TOUJOURS,  
LELO.

HERE'S A SIDE-ON VIEW OF THE BRAIN, SHOWING ROUGHLY WHAT SOME PARTS OF THIS SIDE OF THE BRAIN DO. PLEASE NOTE, SOME PARTS OF THE BRAIN ON THE OTHER SIDE CONTROL VERY SIMILAR FUNCTIONS.\*

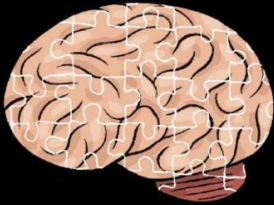
BROCA SPECULATED THAT THE PART OF THEIR BRAINS THAT HAD DEVELOPED A HOLE (CAUSED BY EPILEPTIC SEIZURES, IN BOTH CASES) WAS THE PART RESPONSIBLE FOR ARTICULATING WORDS.



THIS WAS BORN ONE OF THE MAJOR PROJECTS OF NEUROSCIENCE – STILL ONGOING – TO MAP OUT THE BRAIN IN MINUTE DETAIL, DETERMINING WHICH PARTS (IF ANY) ARE RESPONSIBLE FOR WHICH ACTIVITIES.



IN FACT, MUCH OF WHAT WE KNOW ABOUT THE BRAIN COMES FROM STUDYING PEOPLE WHO WERE MISSING PARTS OF THEIRS.

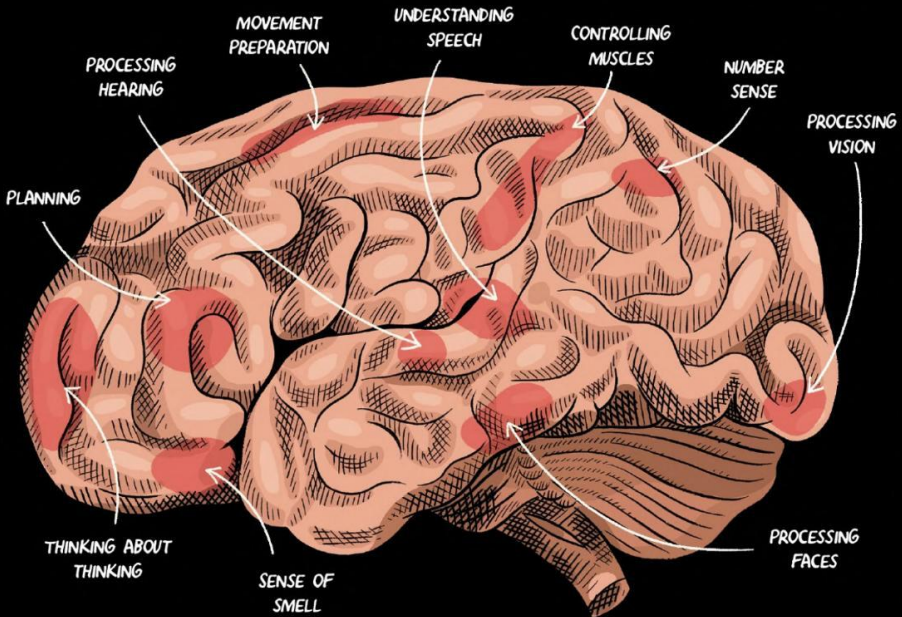


IN THE 1860S, FRENCH PHYSICIAN PIERRE PAUL BROCA FOUND NEAR-IDENTICAL HOLES IN THE BRAINS OF TWO OF HIS PATIENTS.



(FOUND DURING AUTOPSIES AFTER THEIR DEATHS, NATURALLY!)

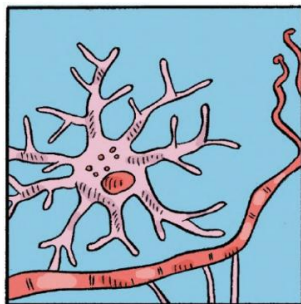
SOME OF THESE BRAIN REGIONS ARE ONLY BROADLY UNDERSTOOD, BUT OTHERS ARE PINPOINTED WITH A SURPRISING DEGREE OF ACCURACY – AND THEY'RE THE SAME FOR ALL HUMAN BRAINS.



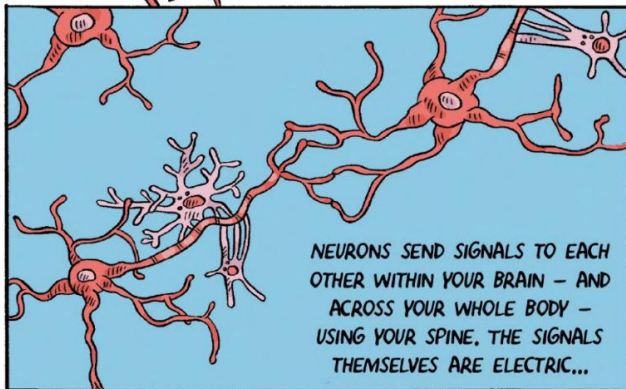
*\*BORING BUT NECESSARY FOOTNOTE: THIS IS ONLY THE OUTER SURFACE OF THE BRAIN. ALL THE BITS THAT KEEP US ALIVE ARE DEEP IN THE CENTER, PLUS, WE RESERVE THE RIGHT TO GO OUT OF DATE AS PEOPLE GATHER MORE DATA.*

LESSON 3:  
WHAT THE BRAIN  
IS MADE OF

BY WEIGHT, BRAINS ARE  
MOSTLY FAT AND BLOOD, BUT IF  
YOU ZOOM IN CLOSE ENOUGH WITH A  
MICROSCOPE, YOU'LL MAKE OUT LOTS  
AND LOTS OF KEY ITEMS, NOTABLE  
FOR THEIR HAIRLIKE STRANDS.



THESE ARE BRAIN CELLS, MORE  
PROPERLY CALLED NEURONS.

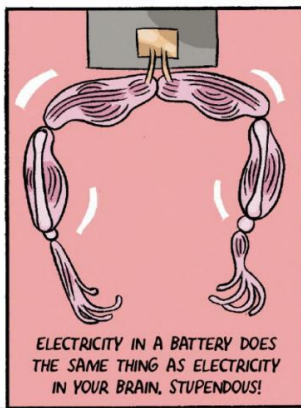
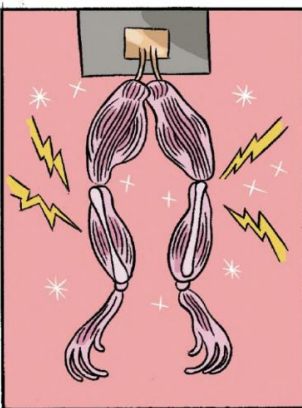


NEURONS SEND SIGNALS TO EACH  
OTHER WITHIN YOUR BRAIN – AND  
ACROSS YOUR WHOLE BODY –  
USING YOUR SPINE. THE SIGNALS  
THEMSELVES ARE ELECTRIC...

...A FACT DISCOVERED BY  
ITALIAN BIOLOGIST LUIGI  
GALVANI TWO CENTURIES AGO.



I PROVED THAT MUSCLES CAN BE  
CONTROLLED USING ELECTRICITY  
AFTER I WIRED UP A DEAD FROG'S  
LEGS TO A BATTERY.\*



ELECTRICITY IN A BATTERY DOES  
THE SAME THING AS ELECTRICITY  
IN YOUR BRAIN. STUPENDOUS!

INSTEAD OF DANCING, SOME DISRUPT ANY BEES WHO ARE DANCING TO PROMOTE A DIFFERENT SITE.



HEY! I'M DANCIN' HERE.

OVER TIME, MORE AND MORE SCOUTS ARE PERSUADED TO GO AND SEE A NEW SITE FOR THEMSELVES. WHEN THEY RETURN, THEY'LL JOIN ONE TEAM, AND HELP TO EITHER DANCE OR DISRUPT.



JOIN US!  
JOIN US!

NO, YOU  
JOIN US!

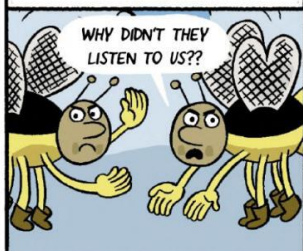
EVENTUALLY, A CRITICAL MASS OF SCOUTS ALL DANCE FOR ONE TEAM. THIS PERSUADES THE ENTIRE HIVE TO FLY TO THEIR CHOSEN SITE TO SET UP THEIR NEW HOME.\*



OK, DONE HERE. LET'S MOVE OUT, YOU BEES.

\*WE'LL GET INTO HOW THIS SUBTLE FORM OF PERSUASION WORKS - STATISTICALLY SPEAKING AT LEAST - IN A LATER CHAPTER.

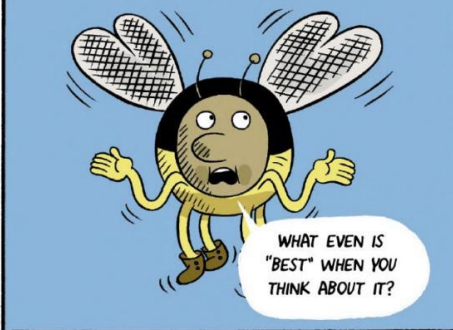
IT'S POSSIBLE THAT THE HIVE IS WRONG, AND THE OTHER SITE WAS A BETTER OPTION.



WHY DIDN'T THEY LISTEN TO US??

BUT OBSERVERS REPORT THAT IT USUALLY IS THE BEST SITE.

IT'S A QUESTION OF PERSUADING ENOUGH BEES TO AGREE, RATHER THAN AIMING TO MAKE THE LITERAL "BEST" DECISION.

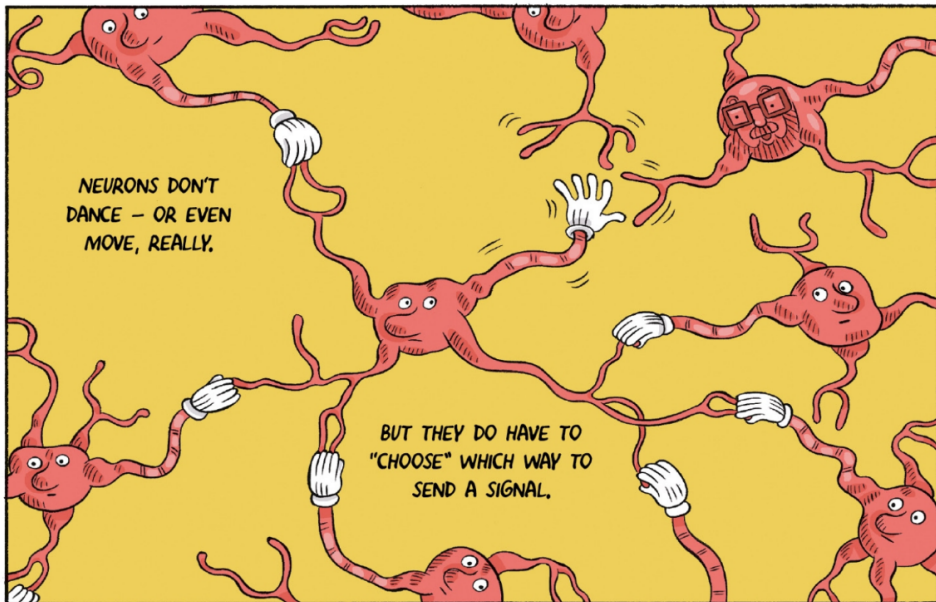


WHAT EVEN IS "BEST" WHEN YOU THINK ABOUT IT?

AND YES, THIS WHOLE THING TRULY IS A USEFUL ANALOGY TO HOW NEURONS WORK.

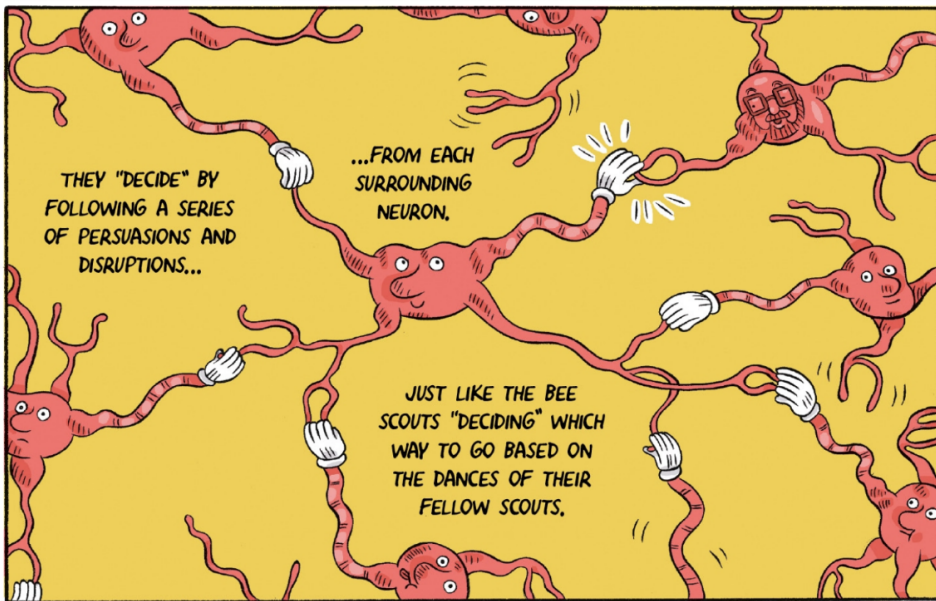


YOU MEAN WE CAN DANCE???



NEURONS DON'T  
DANCE - OR EVEN  
MOVE, REALLY.

BUT THEY DO HAVE TO  
"CHOOSE" WHICH WAY TO  
SEND A SIGNAL.

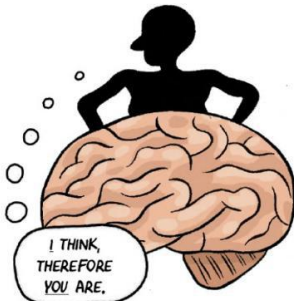


THEY "DECIDE" BY  
FOLLOWING A SERIES  
OF PERSUASIONS AND  
DISRUPTIONS...

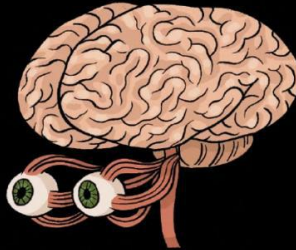
...FROM EACH  
SURROUNDING  
NEURON.

JUST LIKE THE BEE  
SCOUTS "DECIDING" WHICH  
WAY TO GO BASED ON  
THE DANCES OF THEIR  
FELLOW SCOUTS.

LESSON 5: HOW YOU USE  
YOUR BRAIN – AND HOW  
YOUR BRAIN USES YOU



ONE OF THE BEST UNDERSTOOD BRAIN FUNCTIONS IS VISION,  
HERE'S WHAT'S GOING ON WHEN YOU LOOK AT THE WORLD.



ALTHOUGH YOUR EYES ARE AT THE FRONT, THEY'RE WIRED UP  
TO THE BACK OF THE BRAIN, WHERE THE VISUAL CORTEX IS.

STEP 1 – AND THIS MIGHT BE A  
SURPRISE TO YOU – BEGINS IN THE  
BRAIN. BEFORE PROCESSING ANY  
INFORMATION COMING THROUGH  
YOUR EYES, YOUR BRAIN KNOWS  
WHAT IT EXPECTS TO SEE.



WHAT YOUR BRAIN  
EXPECTS TO SEE  
THROUGH THE WINDOW.

STEP 2: INFORMATION  
FROM YOUR EYES CONFIRMS  
OR DENIES THAT MENTAL  
PICTURE, WHICH YOUR BRAIN  
SIMULTANEOUSLY ADJUSTS.



WHAT THE ACTUAL  
VIEW IS.\*

*\*THIS BOOK IS TAKING THE PHILOSOPHICAL POSITION THAT THERE  
IS AN ACTUAL REAL WORLD OUT THERE, EXTERNAL TO OUR BRAINS.  
OTHER PHILOSOPHICAL POSITIONS ARE AVAILABLE.*

STEP 3: REPEAT ON  
A MICROSECOND-BY-  
MICROSECOND BASIS.

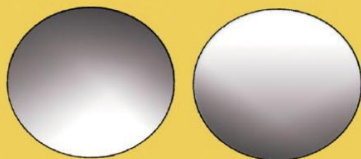


ONE TYPICAL PREDICTION  
"FAIL" IS IF AN ANIMAL  
SUDDENLY APPEARS –  
BECAUSE SUCH MOVEMENTS  
TEND TO BE UNPREDICTABLE.

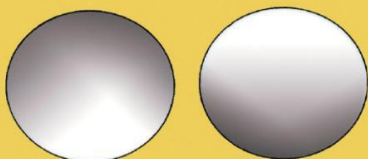




WE CAN VERIFY THAT OUR BRAINS ARE DOING MORE WORK THAN OUR EYES BY TESTING OUR VISION. CONSIDER, FOR EXAMPLE, THESE CIRCLES:



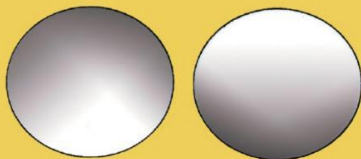
YOU KNOW THAT THIS IS A 2-DIMENSIONAL IMAGE, BUT YOU CAN'T HELP SEEING THE CIRCLES AS 3-DIMENSIONAL BUMPS.



THIS ONE'S STICKING INTO THE PAGE.

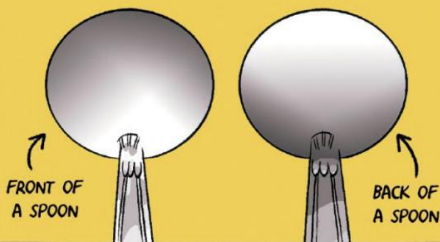
THAT ONE'S STICKING OUT.

NO MATTER HOW MUCH YOU TELL YOUR BRAIN THAT THESE ARE FLAT CIRCLES, NOT BUMPS, YOUR BRAIN CAN'T SEE PAST THE ILLUSION.



ANNOYING, ISN'T IT?

A LIFETIME OF EVIDENCE HAS PERSUADED YOUR BRAIN THAT OBJECTS WITH A SHADOW AT THE TOP ARE CONCAVE, WHILE OBJECTS WITH A SHADOW AT THE BOTTOM ARE CONVEX.



TRY TURNING THE PAGE UPSIDE DOWN.

YOU STILL CAN'T TELL YOUR BRAIN TO SEE THE CIRCLES AS "FLAT."



I THINK THIS IS SOMETHING WIRED INTO OUR BRAINS VERY EARLY IN LIFE, BASED ON LIVED EXPERIENCE.

AND I THINK THIS IS SOMETHING WIRED INTO OUR BRAINS IN OUR DNA, THE PRODUCT OF EVOLUTION.

THIS IS ABOUT AS DRAMATIC AS OUR FAMILY ARGUMENTS GET.



YOUR BRAIN WORKS BY MAKING ASSUMPTIONS ABOUT THE WORLD AND THEN USING YOUR SENSES TO CONFIRM, OR, LESS OFTEN, DENY THOSE ASSUMPTIONS, WHEN FACED WITH AN OPTICAL ILLUSION LIKE THE CIRCLES, THE ASSUMPTIONS YOU MAKE ARE SO STRONG THAT YOUR SENSES AREN'T ENOUGH TO DENY THEM! BUT OVERALL, OUR BEST DESCRIPTION FOR THE WAY IT WORKS IS TO SAY:

your brain is a  
Bayesian prediction engine.

HUH?

HOW CAN I BE THAT  
WHEN I DON'T EVEN KNOW  
WHAT IT MEANS?

LET US EXPLAIN! "BAYESIAN" AS IN "BASED ON  
THE WORK OF REVEREND THOMAS BAYES.\*\*

SOMEONE WE THINK  
IS A KEY FIGURE  
IN THE HISTORY OF  
UNDERSTANDING THE  
BRAIN.



BAYES WAS AN 18TH-CENTURY NONCONFORMIST  
MINISTER WHO, IN FACT, NEVER GAVE THE BRAIN  
ITSELF ANY PARTICULAR THOUGHT. HE WAS  
INTERESTED IN PROBABILITY.

PICK A  
BALL FROM  
MY BAG.



\*THERE ARE NO KNOWN PORTRAITS OF BAYES, SO THE LIKELIHOOD THAT ANY OF OUR PICTURES HERE REPRESENT BAYES HIMSELF IS  $P(A/B)$  ETC., ETC. (LITTLE PROBABILITY JOKE FOR YOU THERE.)

HUH, A WHITE  
BALL, WHAT ARE  
THE CHANCES  
OF THAT?



HIS WORK ON PROBABILITY GOT HIM  
ELECTED AS A "FELLOW" OF THE  
UK'S ROYAL SOCIETY - MOSTLY, ONE  
SUSPECTS, BECAUSE MANY FELLOWS  
WERE KEEN GAMBLERS.

SHHH! IMPORTANT  
EXPERIMENT IN  
PROGRESS.



BAYES BEGAN TO BECOME POPULAR  
AGAIN IN THE 1950S. TODAY HE IS  
EMBRACED ACROSS THE INTERNET.

WHAT MATTERS  
IS THAT BAYES  
IS COOL, AND  
IF YOU DON'T  
KNOW BAYES YOU  
AREN'T COOL.\*

\*WE'RE QUOTING NOTED BAYES ENTHUSIAST  
ELIEZER S. YUDKOWSKY.

RIGHT, THAT'S ENOUGH  
OF THE BASICS.

NOW YOU KNOW  
ALL YOU NEED ABOUT HOW  
BRAINS WORK – AS FAR AS IT  
MATTERS FOR THE REST OF  
THIS BOOK, ANYWAY.

TO SUM UP: YOUR BRAIN  
IS A GIGANTIC NETWORK  
OF NEURONS SQUASHED  
INTO YOUR SKULL,

NEURONS SEND  
SIGNALS TO EACH OTHER  
CONSTANTLY, WHICH IS HOW  
THE BRAIN WORKS.

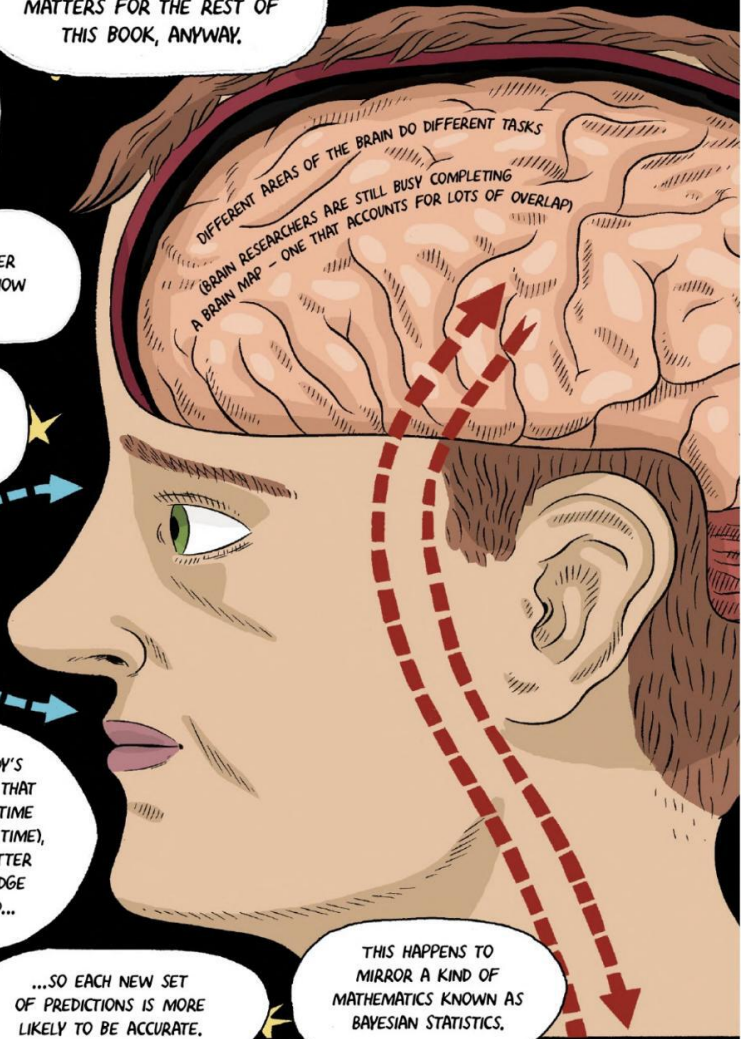
GETTING A BIT MORE  
TECHNICAL, GROUPS OF  
NEURONS PREDICT INFORMATION  
ABOUT THE WORLD...



...AND USE THE BODY'S  
SENSES TO CONFIRM THAT  
INFORMATION. OVER TIME  
(BUT NOT VERY MUCH TIME),  
THEY BUILD UP A BETTER  
STORE OF KNOWLEDGE  
ABOUT THE WORLD...

...SO EACH NEW SET  
OF PREDICTIONS IS MORE  
LIKELY TO BE ACCURATE.

THIS HAPPENS TO  
MIRROR A KIND OF  
MATHEMATICS KNOWN AS  
BAYESIAN STATISTICS.



DIFFERENT AREAS OF THE BRAIN DO DIFFERENT TASKS  
(BRAIN RESEARCHERS ARE STILL BUSY COMPLETING  
A BRAIN MAP – ONE THAT ACCOUNTS FOR LOTS OF OVERLAP)

SOME OF THE THINGS WE FIND ESPECIALLY INTERESTING ABOUT ALL THIS:

NEURONS, INDIVIDUALLY, HAVE NO FREE WILL OR ABILITY TO MAKE CHOICES...

...BUT THE WAY IN WHICH THEY WORK TOGETHER GIVES RISE TO THE PHENOMENON WE CALL THE MIND.

WHAT DOES THAT MEAN FOR US AS INDIVIDUALS? IF THE SMALLEST UNITS OF OUR BRAINS HAVE NO FREE WILL, DOES THAT MEAN OUR BRAINS AND MINDS HAVE NONE EITHER?

DOES THE WAY OUR NEURONS COOPERATE HAVE ANYTHING TO DO WITH THE WAY INDIVIDUAL PEOPLE COOPERATE WITH EACH OTHER?

BUT FOR NOW, WE'RE GOING TO TELL YOU A LITTLE MORE ABOUT OURSELVES, AND HOW WE FELT IN LOVE WITH NEUROSCIENCE.

WE'LL GET INTO THAT SOON ENOUGH.

AND EACH OTHER.



**The Friths: who they are,  
and how they came to be.\***

*\*WITH APOLOGIES TO BILL FINGER & BOB KANE*

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