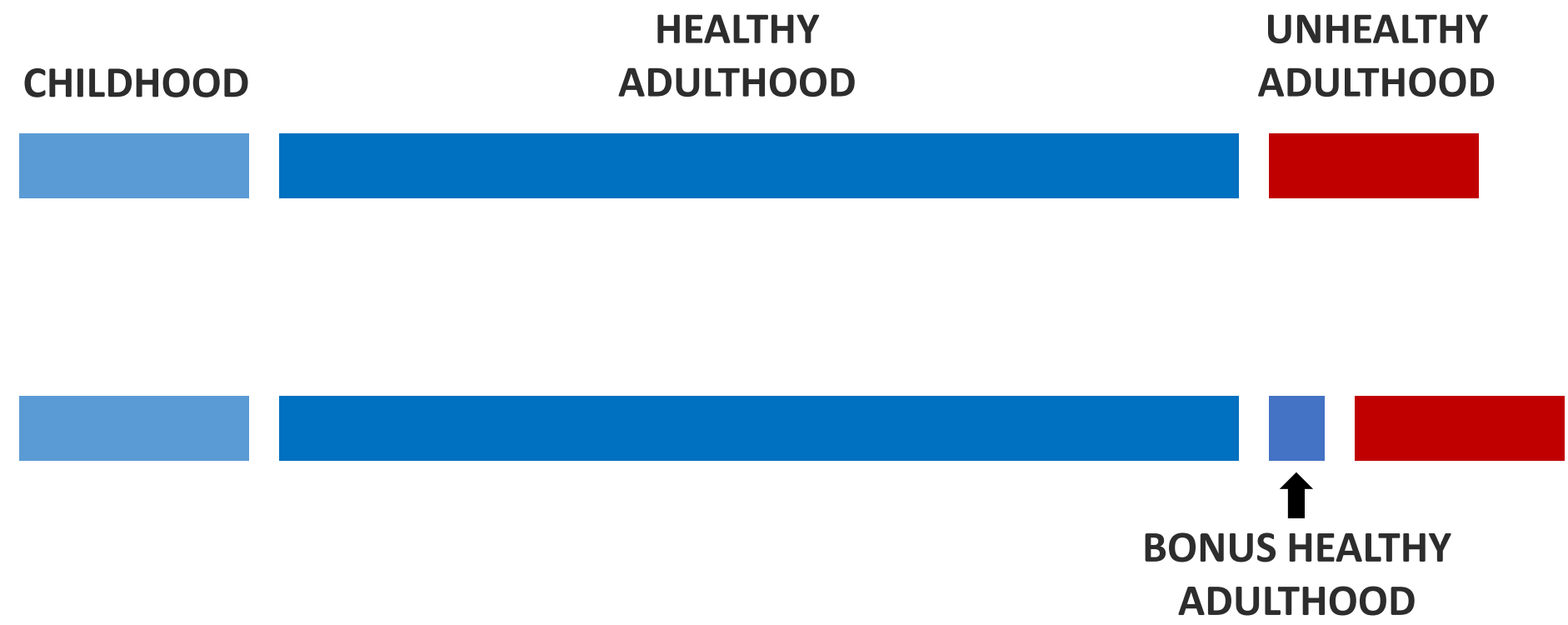


# 5 MYTHS OF LONGEVITY THERAPEUTICS

**James Peyer, PhD**  
**Next Gen Forum – Investing in Longevity**  
**6 December 2018**

# The aim of longevity therapeutics is to extend healthy life



# MYTH #1

**WE SHOULDN'T FUCK WITH NATURE**

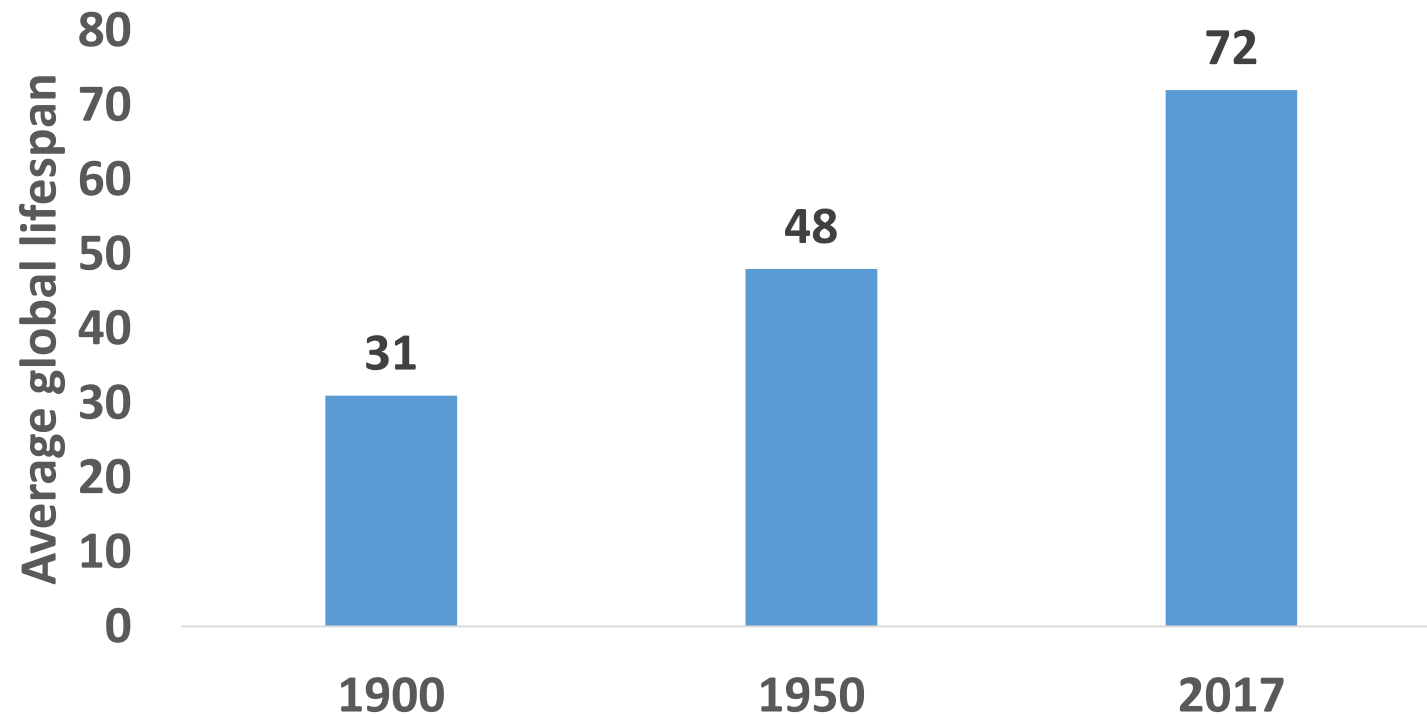
## Humans don't "naturally" die from the diseases of aging

	1900	2018
Leading causes of death	Influenza Pneumonia Tuberculosis	Heart disease Cancer Stroke

“The life of man is nasty, brutish, and short” – Thomas Hobbes

## We are living longer than ever before

Global health has improved dramatically since 1900












This is an unequivocally **GOOD THING!**

But our world is changing, which brings **NEW CHALLENGES**

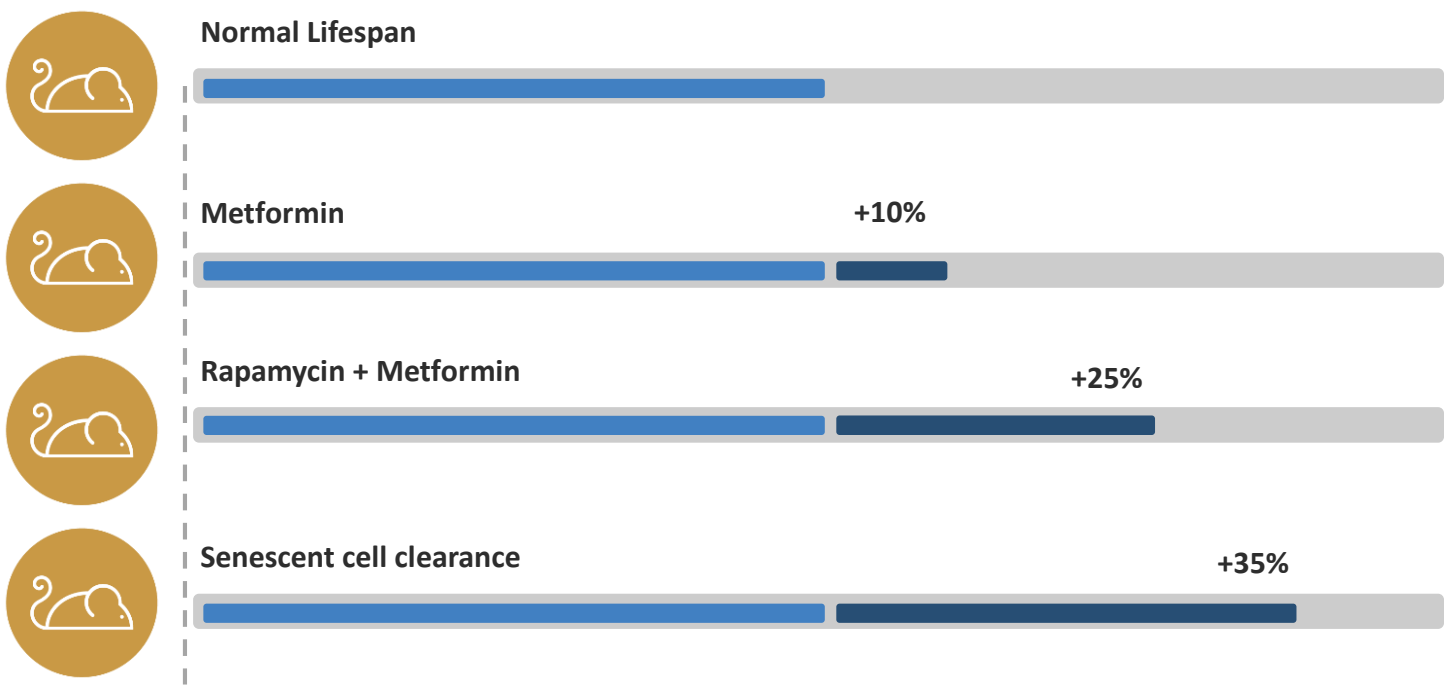
# MYTH #2

**AGING SHOULD BE ADDRESSED, BUT IT WON'T WORK**

## Scientists now understand the mechanistic causes of aging

GENOMIC INSTABILITY 	LOSS OF PROTEOSTASIS 	CELLULAR SENESCENCE 
TELOMERE ATTRITION 	DEREGULATED NUTRIENT SENSING 	STEM CELL EXHAUSTION 
EPIGENETIC ALTERATIONS 	MITOCHONDRIAL DYSFUNCTION 	ALTERED INTERCELLULAR COMMUNICATION 

# Targeting these causes can extend the lifespan...of mice



Mouse middle age

## Mouse before and after senescent cell clearance

BEFORE

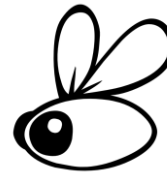


AFTER





## We have hundreds of interventions that extend lifespan



Interventions  
targeting aging  
that extend  
lifespan

650

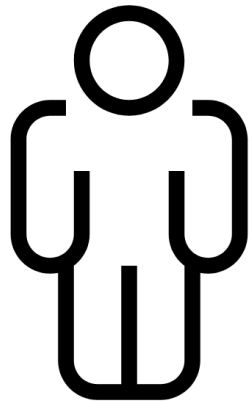
350

70

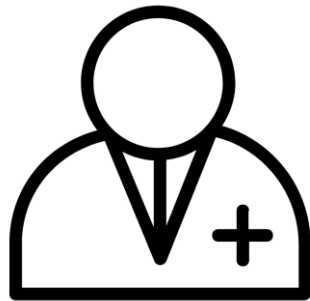
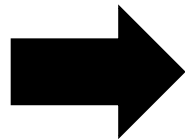
# MYTH #3

IF IT WORKS, MEDICINES CAN'T BE TESTED FOR AGING

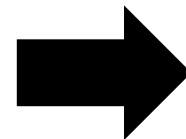
**Longevity therapeutics can be tested and used like other drugs**



**Patient at risk**



**Visits doctor**



**Takes medicine to  
prevent disease**

# MYTH #4

IF IT'S REAL, IT'S ONLY FOR THE RICH

## It's not the treatments driving costs, it's R&D

FULLY CAPITALIZED COSTS OF CREATING ONE NEW DRUG  
(inclusive of failures and time value of money costs)

**\$2.558 B**

Source: Tufts CSDD, 2016

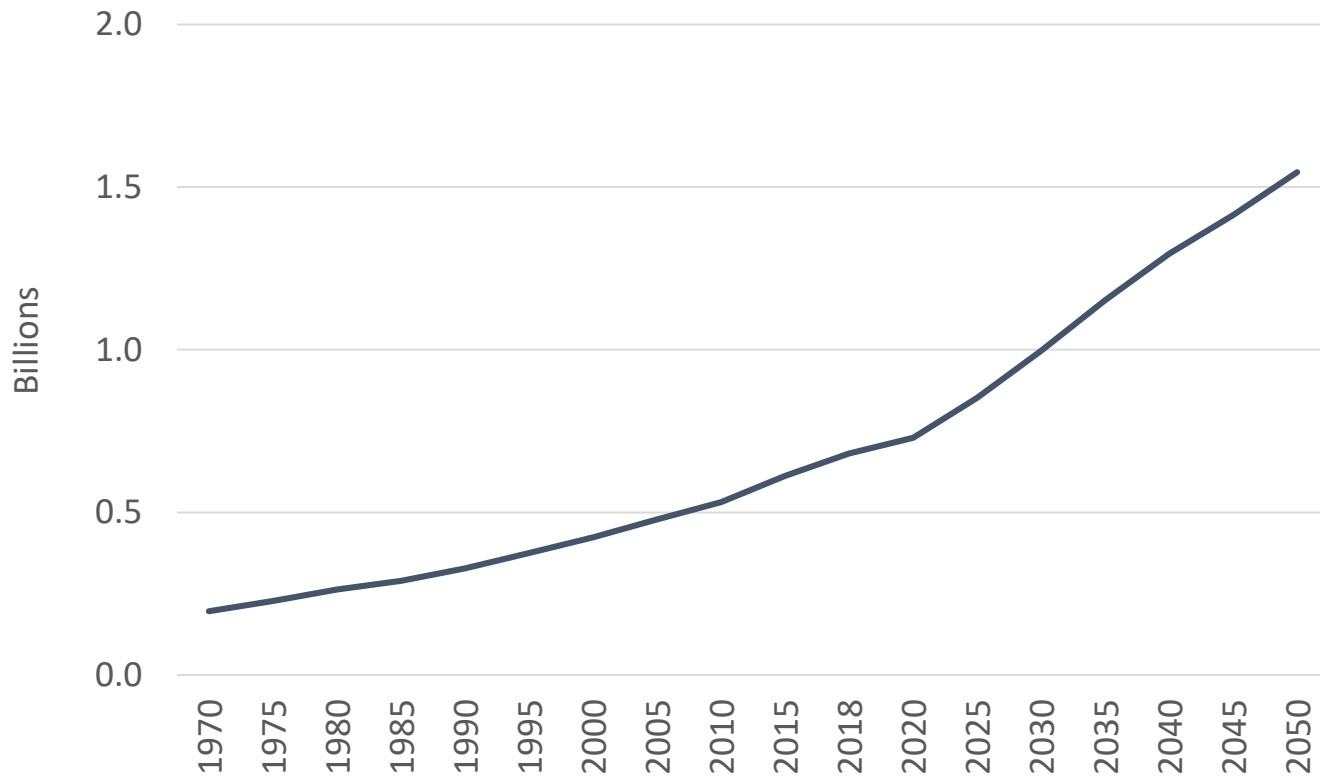
The top grossing drugs of all time are all mass market drugs

- |                               |        |
|-------------------------------|--------|
| 1. Lipitor – high cholesterol | \$149B |
| 2. Humira – arthritis         | \$97B  |
| 3. Seretide – asthma          | \$93B  |
| 4. Remicade – Crohn's         | \$85B  |

# MYTH #5

IF IT'S NOT ONLY FOR THE RICH,  
IT WILL DESTROY SOCIETY

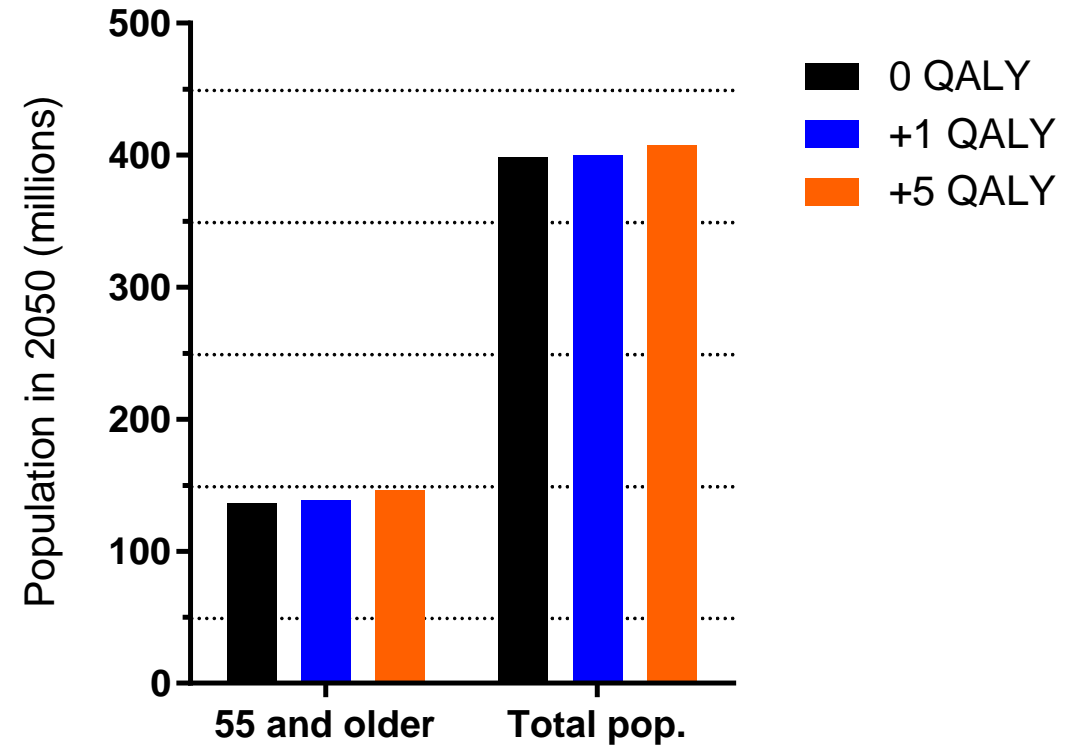
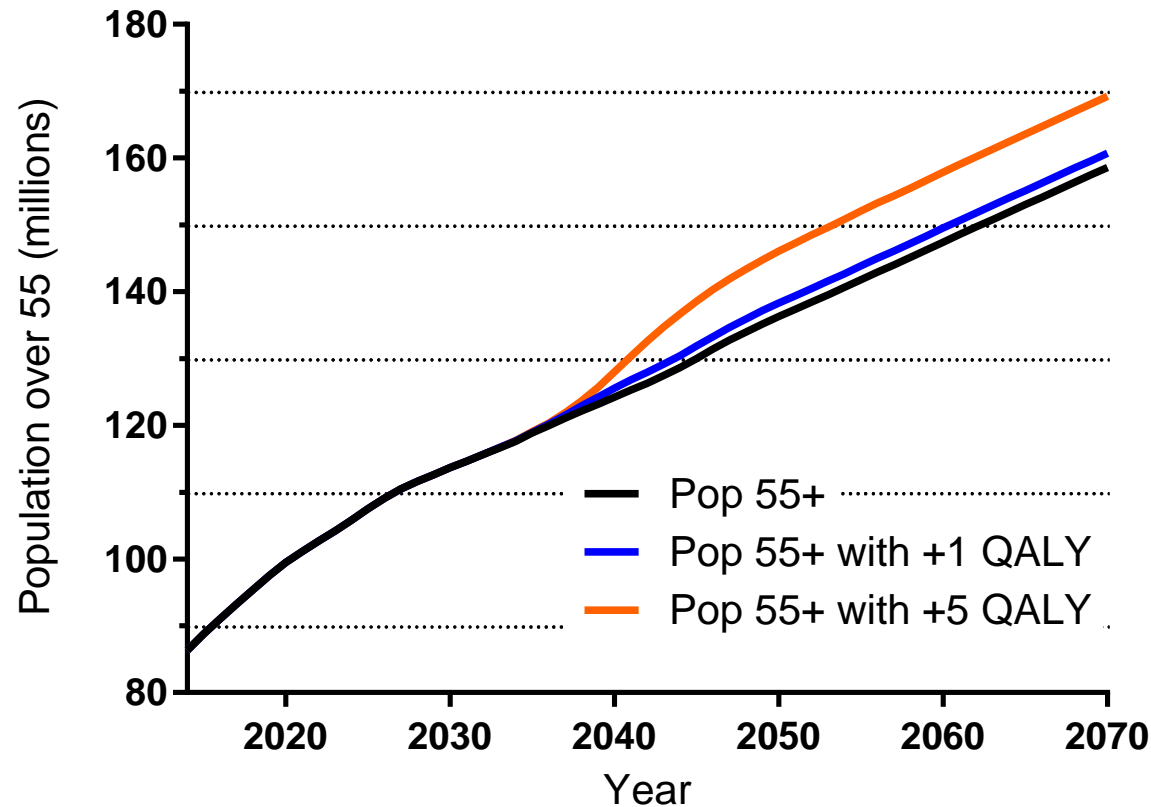
## Actually, the diseases of aging are the real threat to society



**There will be 1.5 billion seniors by 2050**

**The proportion of people over 65 will be 3x higher than today**

## Population does not change dramatically if we slow aging





# 5 MYTHS OF LONGEVITY THERAPEUTICS

**MYTH #1 – WE SHOULDN'T FUCK WITH NATURE**

**MYTH #2 – AGING SHOULD BE ADDRESSED, BUT IT WON'T WORK**

**MYTH #3 – IF IT WORKS, MEDICINES CAN'T BE TESTED FOR AGING**

**MYTH #4 – IF IT'S REAL, IT'S ONLY FOR THE RICH**

**MYTH #5 – IF IT'S NOT ONLY FOR THE RICH, IT WILL DESTROY SOCIETY**

# 5 MYTHS OF LONGEVITY THERAPEUTICS

MYTH #1 – WE SHOULDN'T TUCKER WITH NATURE

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MYTH #3 – IF IT WORKS, WE CAN BE TESTED FOR AGING

MYTH #4 – IT'S ONLY FOR THE RICH

MYTH #5 – IT'S NOT ONLY FOR THE RICH, IT WILL DESTROY SOCIETY

**BUSTED**

## 5 MYTHS OF LONGEVITY THERAPEUTICS

MYTH #1 – WE SHOULDN'T FUCK WITH NATURE

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MYTH #3 – IF IT WORKS, MEDICINES CAN'T BE TESTED FOR AGING

MYTH #4 – IF IT'S NOT ONLY FOR THE RICH

MYTH #5 – IF IT'S NOT ONLY FOR THE RICH, IT WILL DESTROY SOCIETY

**DISCUSSED**

**CONCLUSION: YOU MAKE UP YOUR OWN MINDS**