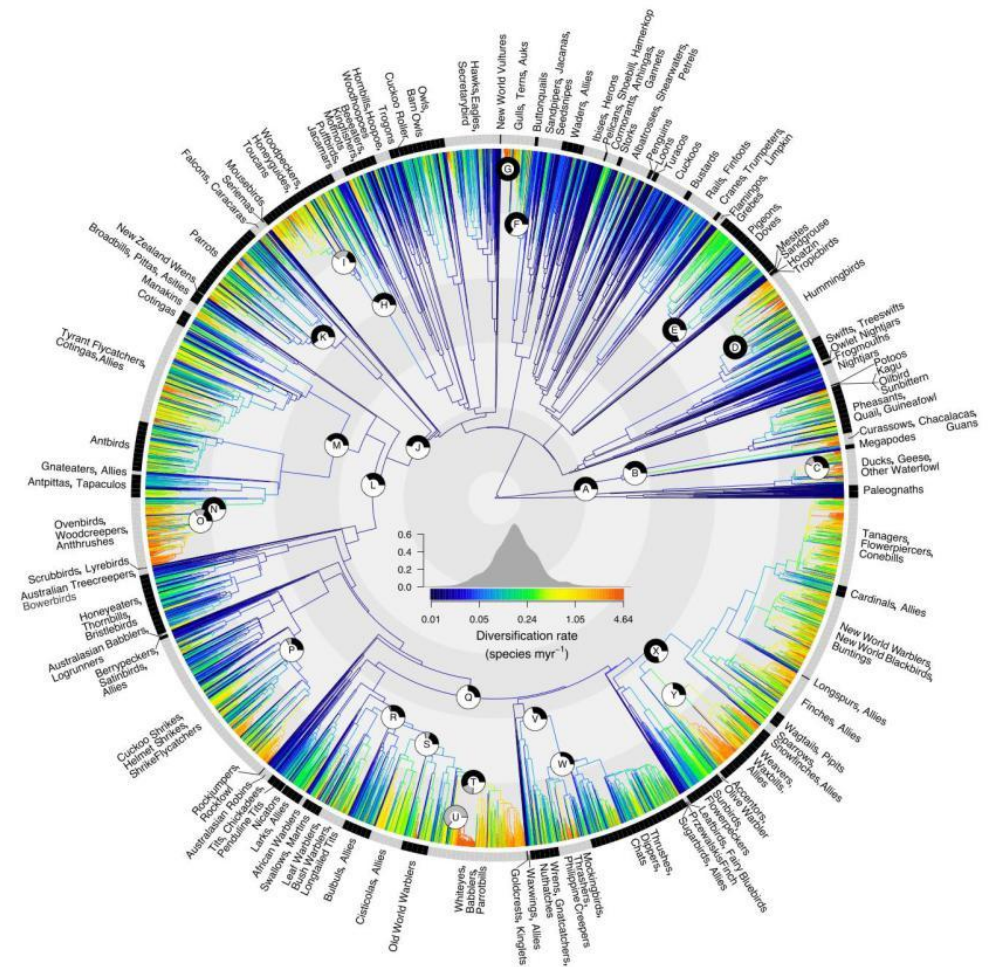


Agnes Ayton FRCPPsych

# The case for including evolutionary theory into the MRCPPsych Curriculum



# Crisis in psychiatry

- ▶ We need an integrative theoretical framework





# Revision of the Postgraduate Curriculum: The Gatsby/Wellcome Neuroscience Project



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## Neuroscience in our Postgraduate Curriculum

Changing a curriculum is like changing the direction of a supertanker. It moves very slowly, takes ages, but has to be done if you do not want to run aground. We feel it is time to update our postgraduate core training curriculum. Not all of it – 'if it ain't broke don't fix it' has always been a good mantra. But we feel that we are lagging behind in equipping the next generation with some of the new developments that have happened in neuroscience and are likely to impact on the profession of psychiatry during their lifetime.



Simon Wessely, 2016

# Finished product

- **Curriculum that:**
  - contains modern neuroscience
  - relates to clinic practice
  - is considered useful by trainees and trainers
  - incorporates the examination syllabus





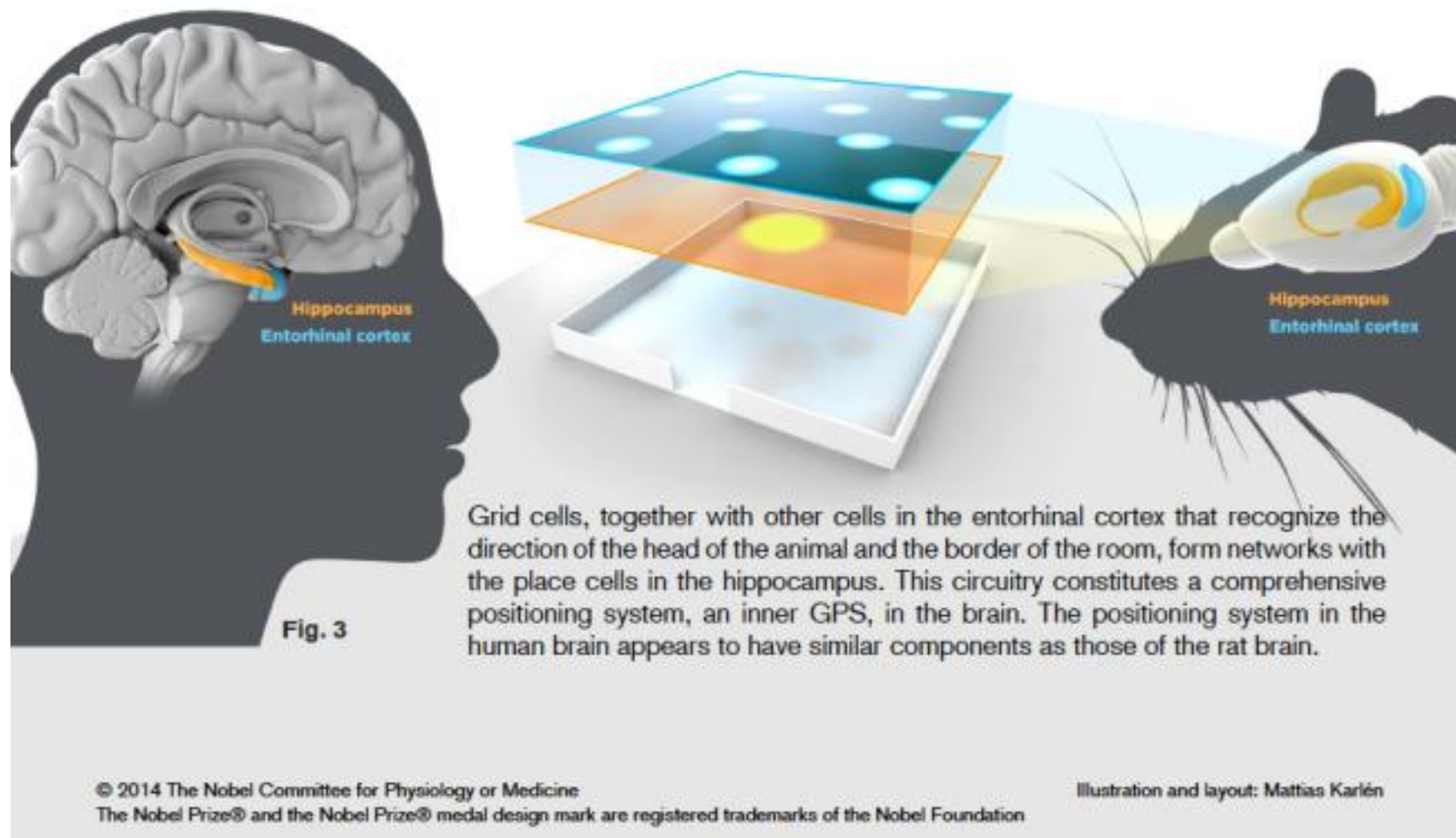
**“Nothing in  
biology makes  
sense except in  
the light of  
evolution.”**

*Theodosius  
Dobzhansky*



# Last 50 years of Nobel prizes in Physiology and Medicine

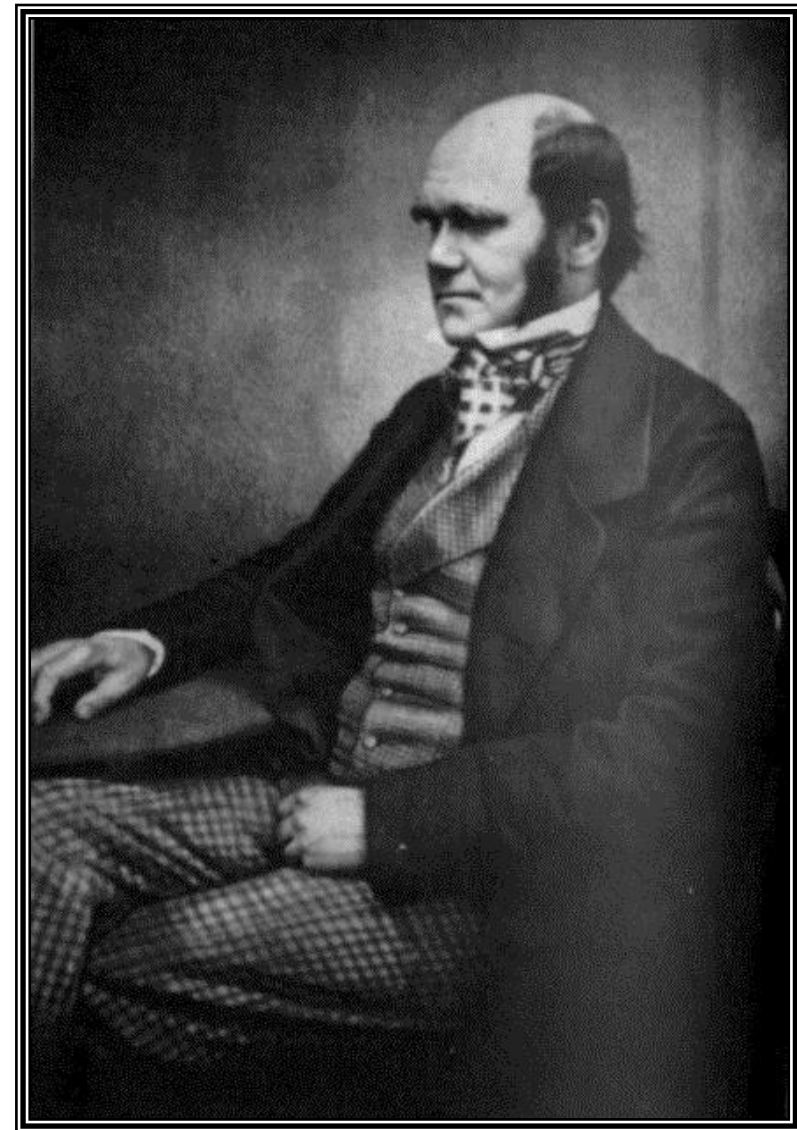
- ▶ An understanding of evolution was necessary in 47 of 50 cases:



# Charles Darwin

## (1809-1882)

- ▶ 1859: The Origin of Species
- ▶ 1871: The Descent of Man, and Selection in Relation to Sex
- ▶ *“My object is ... to show that there is no fundamental difference between man and higher mammals in their mental faculties”*





# The Expression of Emotions in Man and Animals (1872)

- ▶ The first scientific study of the significance and expression of emotions in an evolutionary framework
- ▶ Became the foundation of
  - Ethology
  - Evolutionary psychology
  - Modern psychiatry



PENGUIN CLASSICS

CHARLES DARWIN

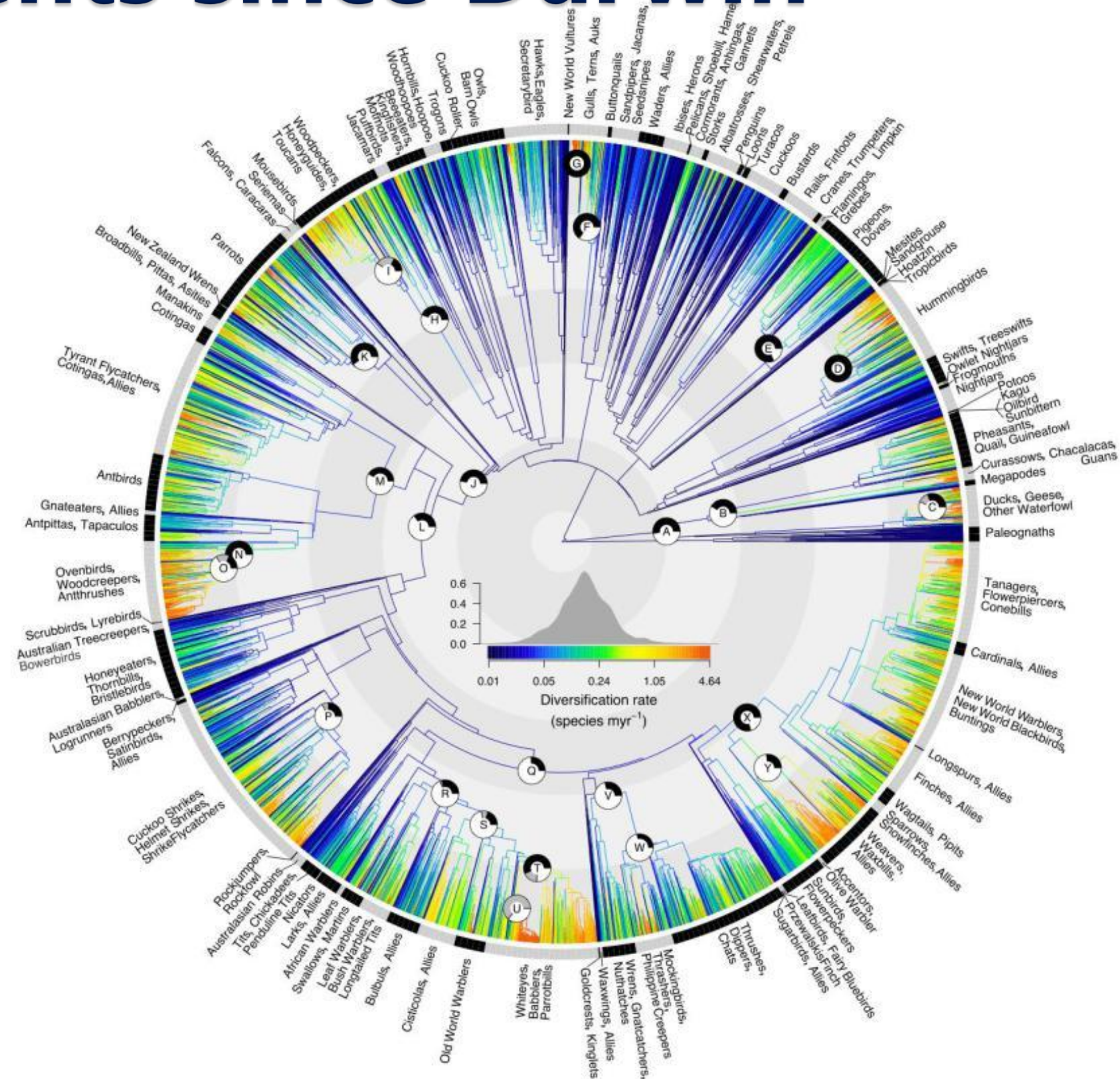
*The Expression of the Emotions  
in Man and Animals*



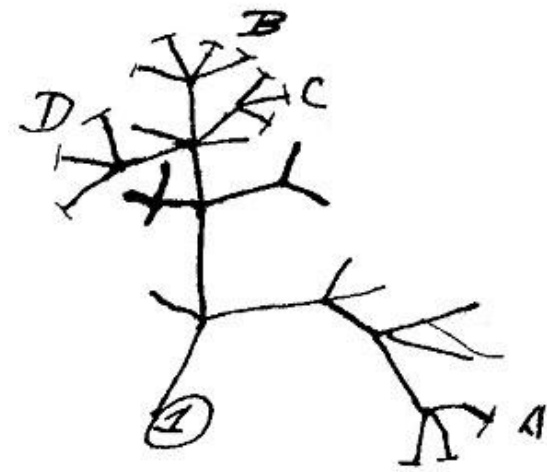
# Implications of the Evolutionary Theory

- ▶ Evolution is about carrying an advantage that ensures **successful reproduction**
- ▶ Evolution is **a law of nature**, like gravity
- ▶ Every living thing is a result of this process
- ▶ Human beings are **not exempt**, but the result of it
- ▶ We share our biology, **including behaviours** with other animals/living things
- ▶ The main difference is the larger brain and the long postnatal development which allow more flexible adaptation to the environment

# Developments since Darwin



*I think*





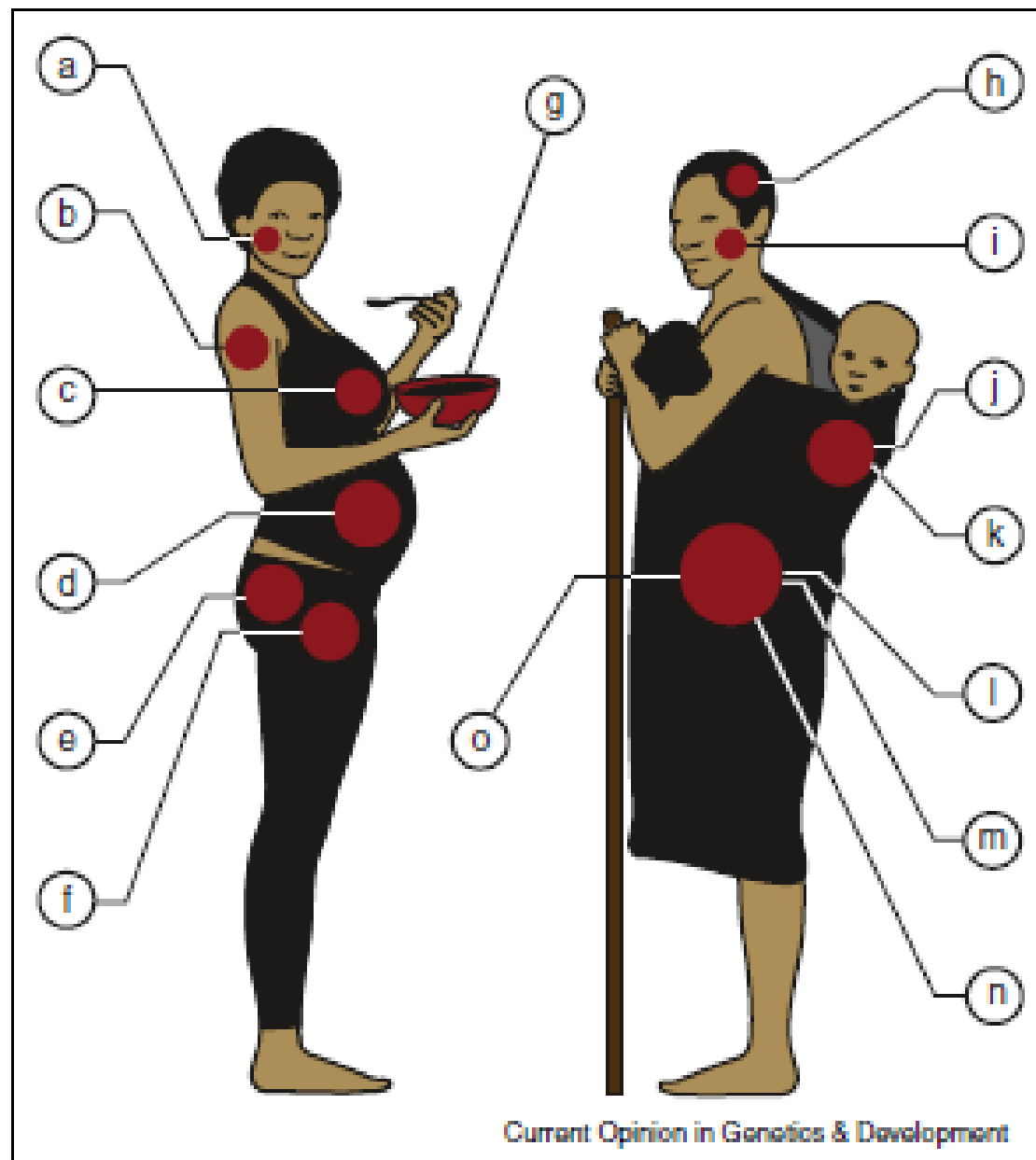
# Developments since Darwin

- ▶ Ethology
- ▶ Molecular biology:
  - DNA sequencing
  - Behavioural genetics
  - Gene regulation
  - Microbiome
- ▶ Statistics
- ▶ Computer technology
  - Internet
  - Mobile technology
  - Network science
- ▶ Neuroimaging

- ▶ Evolutionary biology & psychology:
  - Inclusive fitness
  - Parental investment
  - Reciprocal altruism
  - Life history theory
  - Gender differences
  - Cognitive
  - Development
  - Social brain theory

# Evolutionary biology

Figure 1

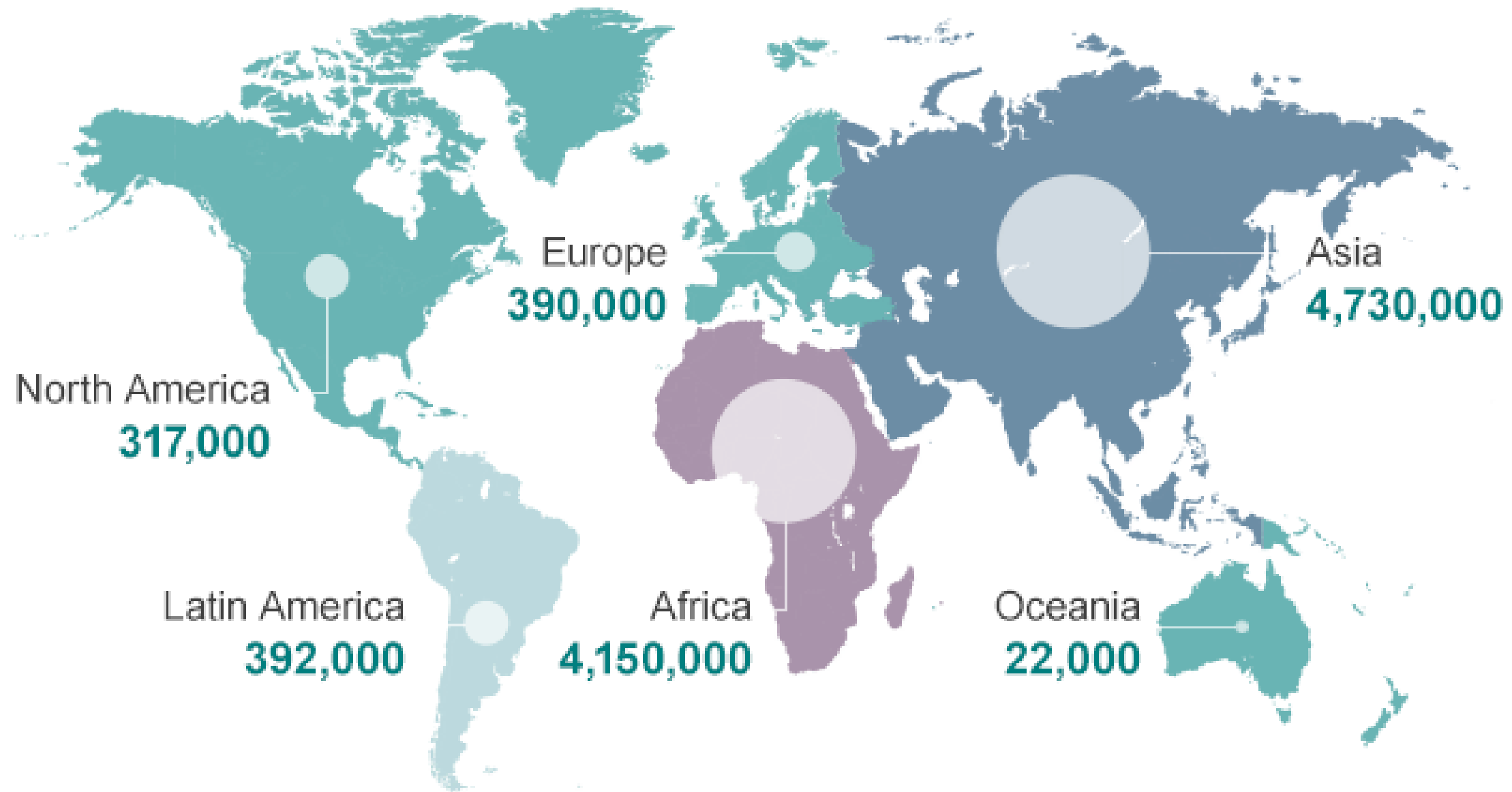


- ▶ Evolution does not happen in isolation
- ▶ There is a complex interaction between organisms and the environment
  - Co-evolution
  - Evolutionary arms race



# Is evolution relevant to medicine?

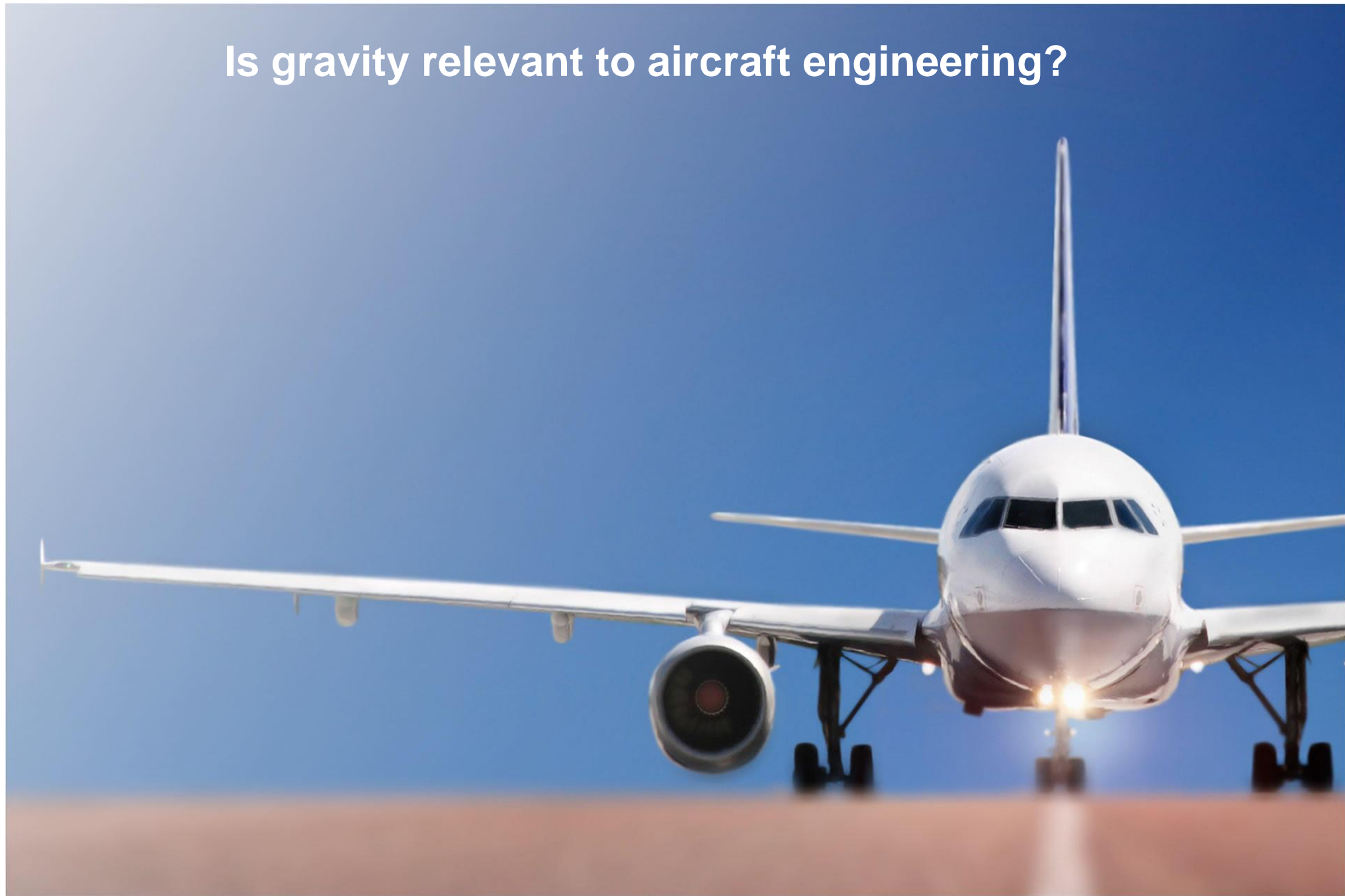
Deaths attributable to antimicrobial resistance every year by 2050



Source: Review on Antimicrobial Resistance 2014

# How is evolution relevant to psychiatry?

Is gravity relevant to aircraft engineering?





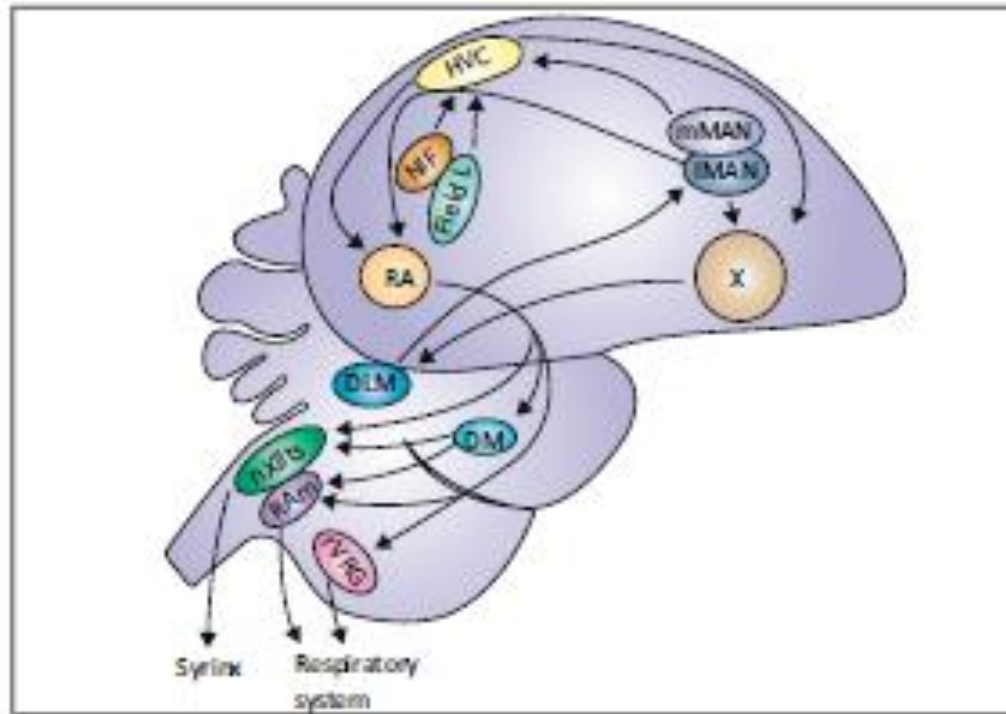
# Ethology: emphasis on integrated understanding of behaviours

- ▶ Tinbergen's 4 questions:



	Proximate	Ultimate
1. Single	How does it work?	What is it for? Adaptive value
1. Historical	How did it develop?	How did it evolve?

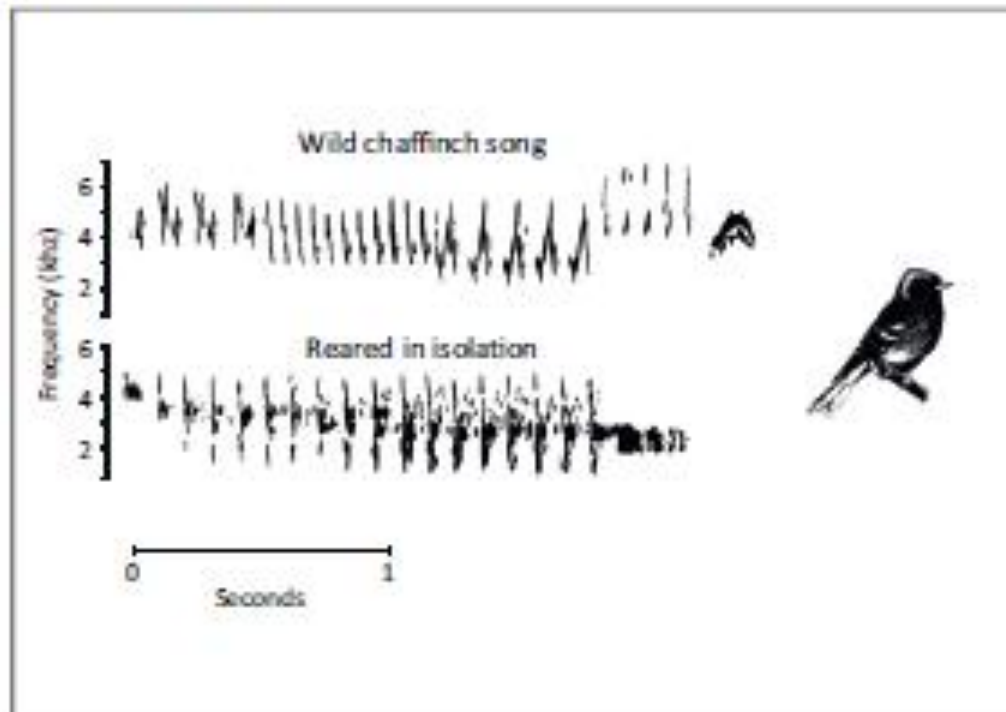
(A) Mechanism



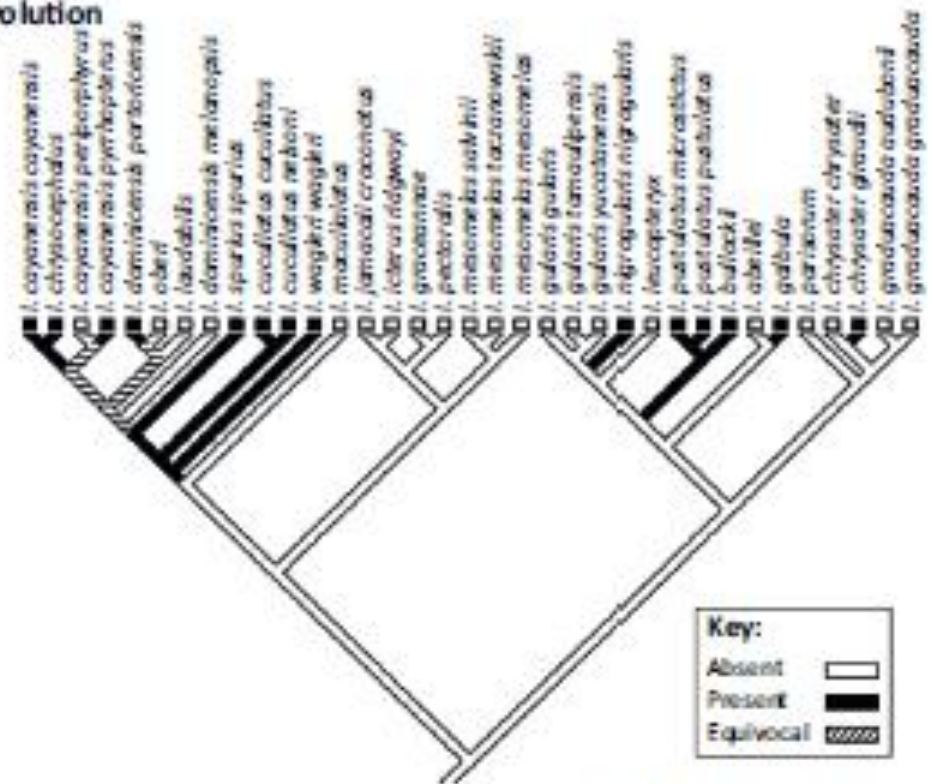
(B) Current utility



(C) Development



(D) Evolution



TRENDS in Ecology & Evolution



# What can learning about evolutionary theory offer to the future generation of psychiatrists?

- ▶ An integrative theoretical framework
- ▶ Help understanding universal human
  - Development
  - Emotions
  - Behaviour
  - Learning and cognition
  - Relationships
  - Gene-environmental interaction
  - Life history
- ▶ Offer a theoretical platform to understand variation (including gender) and pathology
- ▶ Offer an understanding of risk
- ▶ Offer a theoretical framework for new treatments

# Practical implications: Understanding Gender Differences

## Men

Better spatial skills  
More leaders

- ▶ More aggression
- ▶ More autism
- ▶ More schizophrenia
- ▶ More LD

## Women

Better empathy  
More caring

- ▶ More eating disorders
- ▶ More depression
- ▶ More anxiety
- ▶ More dementia

# Practical implications: Inclusive Fitness & Understanding Risk

- ▶ Murder: 10x more common in unrelated than related
  - Except wives
- ▶ Stepparents are 100 times more likely to kill children in their care
  - Living in a stepfamily is the single most powerful predictor of child abuse
- ▶ Child murder is more common when the child and the mother are young and the mother is single/new relationship



# Practical implications: prevention and treatment

- ▶ Changing environments / conditions to reach optimal health
  - School
- ▶ Psychological treatments
  - Need to be compatible with evolutionary understanding of cognition and behaviour
  - Compassion focused therapy, CBT, IPT Non-verbal therapies: music, dance, social contact

# Current structure of the syllabic curriculum: Paper A

- ▶ 1.1 BASIC PSYCHOLOGY:
  - **1.1.1** Learning theory
  - **1.1.7** Motivation: needs and drives
  - **1.1.8** Emotion
- ▶ 1.2 SOCIAL PSYCHOLOGY
  - **1.2.3** Interpersonal issues
  - **1.2.4** Leadership, social influence, power and obedience.
  - **1.2.5** Intergroup behaviour
  - **1.2.6** Aggression
  - **1.2.7** Altruism
- ▶ 2. HUMAN DEVELOPMENT
  - **2.1** Nature and nurture.
    - *Historical models and theories: Freud and general psychoanalytic; social-learning, Piaget.*
  - **2.3** Bowlby attachment theory
  - **2.5** Individual temperamental differences
  - **2.17** Genetic influences on development including gene environment interactions
- ▶ 3.4 MOLECULAR GENETICS

# What is happening in related sciences?

- ▶ There is no biology course without evolution
- ▶ Evolutionary psychology departments are increasing in number worldwide
  - Increasing experimental work & research
  - Postgraduate courses
- ▶ Calls for including evolutionary science into undergraduate medicine (Nesse)
- ▶ Call by the WPA to include evolutionary theory in training of psychiatrists
- ▶ No evolutionary psychiatry department/curriculum (yet)



# Summary

- ▶ The developments in modern evolutionary science can offer a much needed integrative framework for psychiatry
- ▶ Hence the understanding evolutionary sciences is essential for the future generation of psychiatrists
- ▶ This can be part of basic sciences underpinning existing topics in the light of
  - Evolutionary biology
  - Ethology & evolutionary psychology
- ▶ & Critical reading

**Thank you**



# The Catholic Church's Position on the Evolutionary Theory

## John Paul II (1996)

- 'New knowledge has led to the recognition of the theory of evolution as more than a hypothesis.'
- ▶ 1993: he also formally acquitted Galileo, 360 years after his indictment for heresy
  - ▶ 'Two truths cannot be contradictory'



# Dalai Lama

- ▶ “If scientific analysis were conclusively to demonstrate certain claims in Buddhism to be false, then we must accept the findings of science and abandon those claims”
- ▶ No one who wants to understand the world “can ignore the basic insights of theories as key as evolution, relativity and quantum mechanics.”