

WHAT TALK #17 JONATHAN G. FOSS

“IDENTIFYING AQUATIC ADAPTATIONS IN HUMANS” “WHY YET-TO-BE EXPLAINED BY SCIENCE”. “HOW TO CHANGE PERCEPTIONS”



AFTER 50 YEARS OF SWIMMING, TEACHING 40 MILLION LESSONS AND TRAINING THOUSANDS OF INSTRUCTORS, I AM CERTAIN OF TWO THINGS.

- 1. ALL HUMANS ARE THE EXACT SAME MACHINE, DESIGNED PERFECTLY TO SWIM WELL.**
- 2. ALL OF SCIENCE UNDERESTIMATES OUR AQUATIC ADAPTATIONS BY AT LEAST A FACTOR OF TEN.”**

-Jon Foss, teacher, coach, swimming entrepreneur.

JON'S BACKGROUND

- ▶ Learned to swim at age 5, Competitive swimmer,
- ▶ All-American, NCAA & USA Masters
- ▶ B.A. In Biology, my plan was to become an M.D. like my father.
- ▶ Invented Competitive Curriculum "K.A.D.S." 1987-2003, it was successful.
- ▶ Founder & Coach 3 teams; Foxjets, Aquajets, Fastjets.
- ▶ Two American Records, 40x Age group USA records
- ▶ Designed Learn to Swim Curriculum 220 Skills.
- ▶ Co-founded Foss Swim School, now 24 locations in 6 States
- ▶ 40 million lessons, almost \$50m a year in turnover, 1000 instructors.
- ▶ Married 31 years to Susan Foss, we have 5 children.
- ▶ 6 USA Patents, Author of children's book "Begin To Swim".



DEVELOPMENT OF THE CURRICULUMS AND SWIM THEORY

- ▶ As a young competitive swimmer, I remember well being most happy underwater.
- ▶ I observed numerous World Record Swimmers, their technique was remarkably different.
- ▶ In 1987 at age 22, I decided to write a new curriculum based on their strokes.
- ▶ Highly successful team spawned competitive lessons, swim clinics, swim lesson program.
- ▶ In 1993, Foss Swim Schools, goal was to the 98% of children not on my swim team.
- ▶ Complete and total obsession with understanding swimming, "The Science of Swimming".
- ▶ 1995 First exposed to the Aquatic Ape Theory by John Bainbridge, Australian Swim School, L.A.
- ▶ Been a participant on AAT@Yahoogroups and [AAT@groups.io](https://groups.io/g/AAT) for 13 years, post as JDB.

CREATED A SHARED GOOGLE DOC, DISCUSSION AT AAT@GROUPS.IO

PRIMARY CONTRIBUTORS:

- ▶ **MARC VERHAEGEN**
- ▶ **FRANCESCA MANSFIELD**
- ▶ **GARETH MORGAN**
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HOW TO DEFINE?

- ▶ 1. IS IT NECESSARY FOR SWIMMING?
- ▶ 2. OBSERVED IN OTHER AQUATIC MAMMALS?
- ▶ 3. CATEGORY: MORPHOLOGICAL, INSTINCTUAL OR HABITUAL?
- ▶ 4. UNIQUE? TO HOMO OR SHARED WITH **HYLOBATES**, **GORILLAS**, **ORANGUTANS** OR **CHIMPS**.
- ▶ 5. THEORIZED.

Aquatic Adaptations needed for swimming or caused by swimming.

Humans have a radically changed body plan when compared to the Chimpanzees. This is the main list of Swimming Adaptations accumulated through various submissions. The goal is to aggregate and preserve the work of many past AAT Theorists. Please feel free to edit.

AQUATIC ADAPTATIONS IN MODERN HUMANS

Swimming is a universal skill, attainable by all modern humans with time in the water. The ability of all archaic homo to cross every river in Eurasia and Africa in the last 2.5mya suggests two things 1. they were capable swimming and diving for littoral foods and 2. They were likely a single very capable species which entered Eurasia about 2.4mya.

This list is the culmination of dozens of Biologists working for decades to understand the elements in the human bauplan which allow us to swim. Swimming, not persistence running, should be argued as the primary reason for success of homo and it's ability to farm and cross river after river in the Pliocene epoch.

Levels of importance.

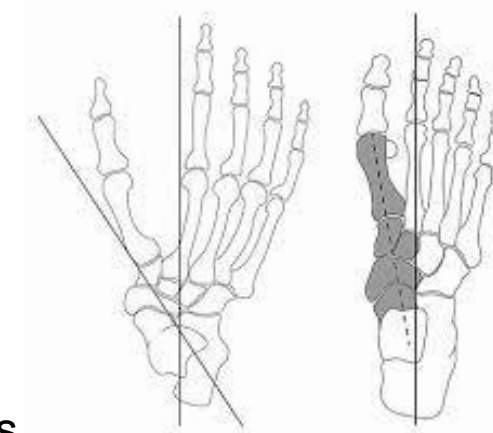
In and effort to organize these have been selected as descriptors of AAT Status

- A. Necessary: (necessary for humans to swim and dive to bottom; hooded nose)
- B. Likely: (byproduct of habitual swimming)
- C. Possible: (result of waterside life)
- D. Coincidental/Observed: (baby swimming)
- E. Theorized: (Seborea, dandruff and need for Fish Oil)

Likely Aquatic Morphology/Behavior

Status: Is it Aquatic? Why? Links - Other notes

- 1. Swimming ability: All modern humans can Necessary - with time and minimal, all humans can learn to swim well.
- 2. Swimming ability in archaic humans Necessary - Rhys Evans exostosis in HN and HE
- 3. Naturally attracted to water, play Necessary - All human populations are attracted to water features



- 4. Ritual Washing Likely - Seen in most human populations
- 5. Adducted Big Toe Necessary - fetal state, allows propulsive feet in water
- 6. Ability to flip the water top of foot (flutter)
- 7. Ability to push water with bottom of foot (breaststroke)

- 8. 100x Eccrine glands, transdermal H₂O absorption Necessary - 100x eccrine than Chimpanzee
- 9. Backward sloping face Necessary - Allows for external nose. Also seen in hylobates.
- 10. Obligatory Bipedal streamlined stance Necessary - Allows wading and directional swimming
- 11. External nose Necessary - Complex structure, Creates airtrap, stops water entering

- 12. Paranasal sinuses Necessary - Present in Erectus and Neanderthal (large)
- 13. Heavy brow ridge (supraorbital torus) Likely - seen in other aquatic mammals
- 14. Heavy brow hairs Likely - seen in other aquatic mammals
- 15. Parasagittal keeling Possible - strongest bone in human body. 3 layers
- 16. Brachiating shoulders Likely - as used in overhead throwing swimming, not in chimp
<https://insidescience.org/news/homo-erectus-was-original-starting-pitcher>
- 17. Wrists that bend backward Maybe - wrist extension in all swimming strokes. Not in Gorilla

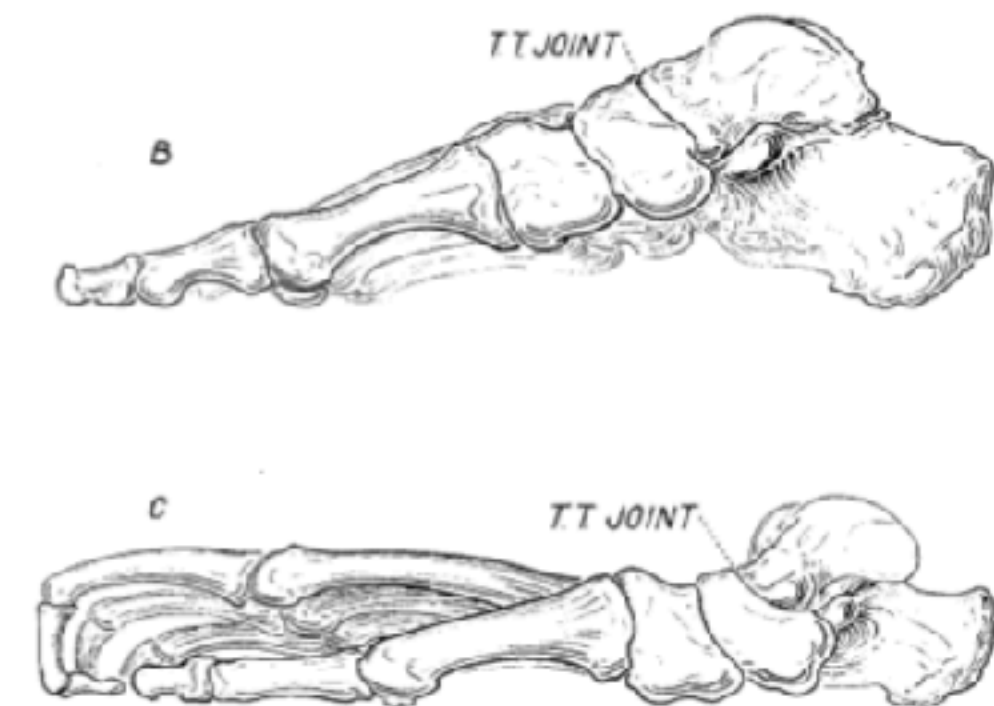
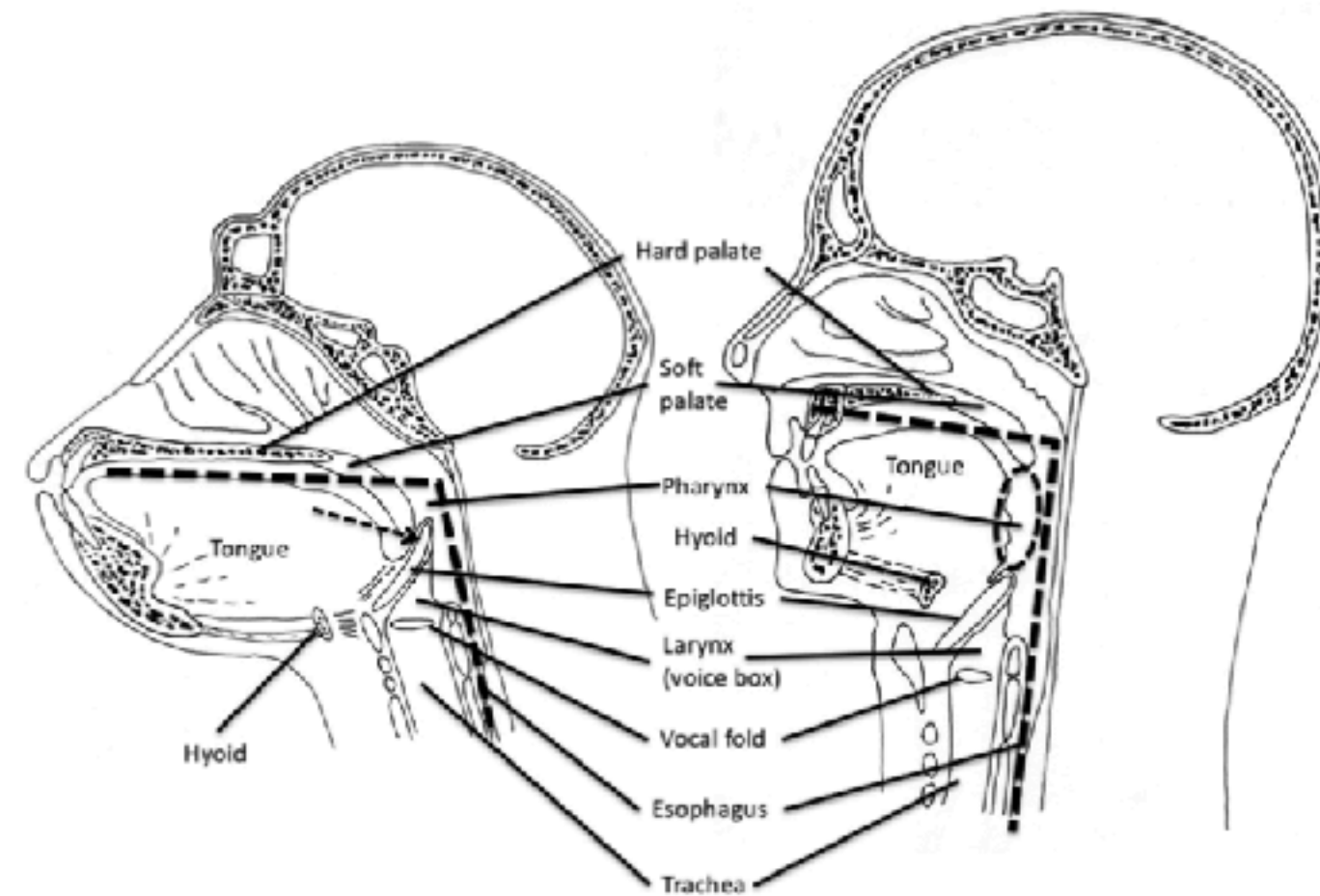


Fig. 1. Chimpanzee and human feet in medial view. A, chimpanzee foot in an arboreal position: plantar flexion about the transverse tarsal joint. B, human foot on the ground. C, chimpanzee foot on the ground: pronation with dorsi-flexion about the transverse tarsal joint. T.T. transverse tarsal joint.

- 18. Flat toes Necessary - Allows for foot propulsion. Poor climbing skills
- 19. Flat fingers Necessary - human hands not designed for suspension.
- 20. Human ability to Scull water with hands Necessary - side to side propulsion, learned at very young age.
- 21. Flat feet, paddle capable feet Necessary - [flat feet with relatively long first and last digital rays, and short close toes*](#)
- 22. Long Lumbar section Twisting Spine. Necessary - Seen in hylobates, allows competitive strokes

23. Long flexible neck

Necessary - allows for keeping downward facing nostrils



24. Human double arched teeth,

Impact resistance, very strong

25. Smooth palate

Possible - Allows for suction,

26. External water tight, sensitive lips

Necessary - upper lip and philtrum are specialized

27. Conscious Breath control

Necessary - seen in all aquatic mammals.

28. Conscious Puffing of cheeks

Necessary - seals palette stopping water from entering nose

29. Large lips capable of sealing mouth

30. Subcutaneous fat layer, complex structure

Necessary - Allows for floating on surface when holding breath

31. Streamlined body hair

Likely - Creates less drag in water, drying

32. Brachycardia, human diving reflex

Likely - heart rate slows when diving underwater.

33. Loss of underfur

Necessary - less drag while swimming

34. Long legs,

Necessary - possibly for wading / running through river, marsh

35. Legs slightly bowed inward

Necessary - good human swimmers, rotate knees inward.

36. Large brain

LIKELY - shellfish and Salmon diet

37. Naked skin, reduction in guard hair

Necessary - also possible via Self-Domestication

38. Vernix Caesa w/ Squalene

LIKELY - Human newborns, California Sea lions(,Red Tide).

39. Swimming babies before speaking

LIKELY - Curiosity of a great ape swimming well

40. Development of neocortex

LIKELY - Conscious swim control, up/down navigation.

41. Descended larynx

Necessary - Laryngeal reflex closes to stop water entering lung

42. hyoidal descent vs mandible

Necessary - only seen in humans, allows singing and dueting

43. Salty fluid expenditure from sweat glands

Possible - adaptations allowing for excess salt removal

44. Able to eat salty foods

Possible - More than most mammals?

45. Salty tears, psychic tears

LIKELY -

46. Acnea (sebaceous glands)

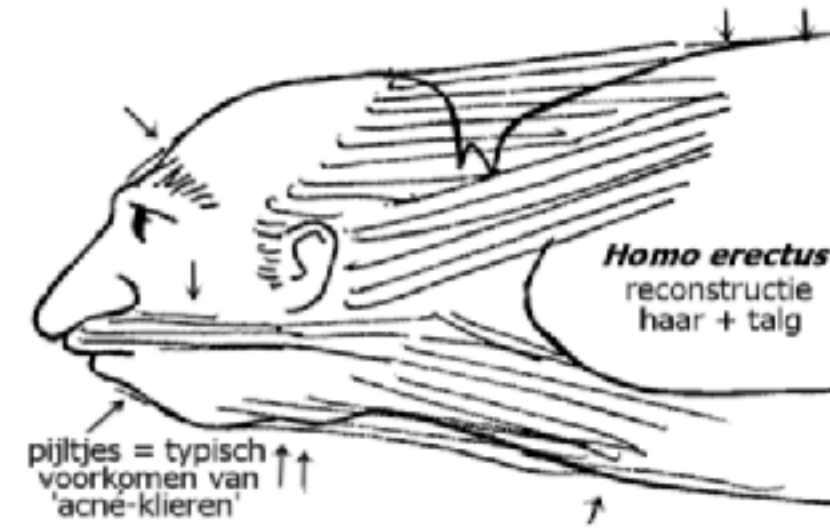
Possible - excess glands on shoulders and face.

PART 3: CURATE LIST OF POSSIBLE AQUATIC ADAPTATIONS, PAGE 4

47. Exostosis: Surfer's ear (Evans)
48. Male hair distribution, alopecia

Evidence byproduct of cold water immersion, 50% of archaics.
Possible - sea lion manes, see illustration in attachment

Marc Verhaegen **Acne** acne vulgaris
Baldness male pattern alopecia
Dandruff seborrheic dermatitis



Een korte inleiding tot de waterapentheorie
1986 Marswin 7: 64-69

- | | |
|---|--|
| 49. Chubby (floating) infants | LIKELY - Infants able to float without filling lungs. |
| 50. Lanugo Hair (newborns) | Possible - Special Hair human newborn & other aquatic animals |
| 51. Infant swimming reflex | Possible - , infants will perform a swimming-like motion |
| 52. Infant righting, Morrow reflex | Possible - child flips on back in water |
| 53. Cold water Gasp reflex | Necessary - all humans gasp when dropped in cold water. |
| 54. Cold water capable adaptation | |
| 55. Angled vagina, hymen, vaginal ridges | LIKELY - Long Vagina possible for wading and swimming. |
| 56. Low pH of canal, Labia | LIKELY - Lactobacillus colonies |
| 57. Lunar Tidal Menstruation cycle | Possible - Menstration tied with Moon or Tides, |
| 58. Loss of menstrual signal on buttocks | Possible - human females have different buttocks structure. |
| 59. Long Penis No Penis bone or spines | LIKELY - Radical changes compared to chimpanzee. |
| 60. Year-round pendulous/floating breasts | Necessary -Buoyancy, not seen in other apes, primates, |
| 61. Ear-wax | Necessary - likely to prevent water from entering. |
| 62. Hyperventilation | Necessary - likely |
| 63. squalene-rich sebum & vernix* | LIKELY - Seen in other aquatic mammals. |
| 64. Common obesity | LIKELY - Some humans able to float without holding breathe |
| 65. Myopia | Theorized - Some humans able to see well underwater. |
| 66. Spleen enlargement | LIKELY -Extra Red Blood Cells emitted during diving & breath holding |
| 67. Kidneys able to handle brackish water | LIKELY - multi-pyramidal (renculated) kidneys* |
| 68. Webbed fingers & toes | LIKELY -Significant % of humans still display webbing. |
| 69. platymeria (dorso-ventr.flattened femora) | LIKELY - Possible Swimming adaptation |
| 70. Wide and deep thoraxes | LIKELY - (as in most shallow-diving endotherms) |

- | | |
|--|---|
| 71. Water loss inefficiency: | LIKELY - tears / dilute urine / moist faeces / the inability to drink much at a time* |
| 72. Copious thermoactive sweating | Theorized - copious thermo-active sweating ** |
| 73. Thick Tooth Enamel | Theorized - eating shellfish thicker tooth enamel |
| 74. Wrinkling of finger tips | LIKELY -Possibly aids in underwater touch, hand propulsion. |
| 75. Need for water | LIKELY -High need for daily water, quick to thirst |
| 76. NEED for DHA, IODINE, Salt | LIKELY -High need for sodium, DHA and iodine * |
| 77. Water borne parasites | Theorized - Evidence more than 3 spp require water for their lifecycle |
| 78. Reduced smell | http://aquatic-human-ancestor.org/anatomy/olfactory-sense.html |
| 79. Muscular Myoglobin | LIKELY - Also seen in deep diving mammals |
| 80. Ease of childbirth in water | Coincidental/Observed: |
| 81. Fewer Red Blood Cells more Heme | LIKELY - possible diving adaptation, Spleen stores Hemoglobin |
| 82. periodic breathing | Coincidental/Observed: |
| 83. Heavy Trabecular Bone Density (Robust) | Theorized - seen Pacific island populations which swim well. |
| 84. laryngo- and bronchospasm | Theorized - |
| 85. vasomotor rhinopathy | Theorized - |
| 86. Seborrhea | Theorized - |
| 87. Dandruff | Theorized - |
| 88. male pattern alopecia | Theorized - |
| 89. Rhinophyma | Theorized - |
| 90. Osteoarthritis | Theorized - |
| 91. inguinal hernias | Theorized - |
| 92. varicose veins | Theorized - |
| 93. diminished apocrine glands | Theorized - |
| 94. enlarged sebaceous glands | Theorized - |
| 95. Hymen | Possible to avoid toxic aquatic elements (red tide) |
| 96. mating face to face | Theorized - |
| 97. not panting for cooling | Theorized - |
| 98. prolific Pacinian corpuscles | |
| 99. poor tolerance to overheating | LIKELY - |
| 100. multi pyramidal kidney morphology | |
| 101. women's long hair | Theorized - Not seen in great apes, something to hold on to while swimming |
| 102. Women's platform buttocks | Theorized - platform to stand on while wading. |
| 103. High instep | ? |
| 104. Tensor fasciae latae muscle | Theorized - Key muscle used in swimming. Lost in Gorilla & Chimp |
| 105. Poor thirst awareness | Theorized - explained by waterside adaptation vs. Savannah adaptation |
| 106. Poor salt deficiency awareness. | Theorized - High salinity foods, environment |
| 107. Menopause | LIKELY - seen only in orca & short-finned pilot whales |
| 108. Other possible: asthma, cretinism, sinusitis, sleep apnea, Cheyne-Stokes, orthopedic problems | |

PART 3: CONVERSION TO SHARED GOOGLE SPREADSHEET. (IN PROCESS)

Aquatic Adaptations in Homo Pivot Table

Number	Human Aquatic Adaptation	Description 1.Necessary 2.Likely 3.Possible 4.Coincidental 5.Theorized	Evidence	Morphological or Behavioral or instinctual	Seen in other Apes? P,G,O, Hylobates.	Critical for Swimming and Diving to Depth Y/N/Possible	Helpful Graphic?	Proposed by? Links papers cited.
1	External Hooded Nose, Complex structure, keeps water out and air in.	1	Key feature allows swimming with both hands.	Morphological	No	Yes		1. https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006616
2	Adducted Big Toe and remarkable human foot structure.	1	Necessary for two methods of propulsive kicking	Morphological	No	Yes		https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6358692/#:~:text=The%20human%20foot%20evolved%20over,muscles%20actively%20assist%20this%20ofunction.
3	Universal (100%) Human Ability to Learn to Swim Underwater with both arms and legs.	1	Observed from Swim School industry in All Humans	Behavioral	No	Yes		
4	Ability to swim Extraordinary distances and inwater survival	1	Olympic, Modern, Ancient Crossings	Behavioral	No	Yes		
5	Evidence of Swimming Ability In Archaic Humans In Eurasia and Africa.	1	As evidenced by Crossing Barriers, thousands of shell middens, ear exotases.	Morphological	No	Yes		
6	Natural Attraction to water. Play in Water.	1	Pools, hot-tubs, beaches	Behavioral	No	Yes		
7	Diving reflex, Heart rate slows when face submerged In water under 69F, 18C	1	Scientifically measured.	Instinctual	Unlikely	Yes		
8	Ritual Washing	1	World-wide phenomenon	Instinctual	No	Yes		
9	Eccrine Glands 100x that of Chimpanzee, near absence of Apocrine glands in humans.	1	Scientifically measured	Morphological	No	Yes		
11	Backward slope of Face from Brow to chin, allows external nose to work. (Arichony?)	1	Allows the External nose to be external.	Morphological	Hylobates	Yes		
12	Streamlined stance, Obligatory Bipedalism	1	Universally observed.	Morphological	Hylobates	Yes		
13	Trimodal Kicking, Flutter and Pushing kick (Breaststroke) and a combination of the two, (scissor)	1	Universally Observed, World-wide curriculums.	Morphological	No			
13	Brachiating Shoulders, Necessary to swim all strokes and throwing overhand.	1	Universally observed.	Morphological	Hylobates	Yes		
14	Paranasal Sinuses, also present in Erectus and HN.	1	Universally observed.	Morphological	No	Yes		
16	Flat Toes, Metatarsals	1	Seen in all Archaics and many modern humans.	Morphological	No	Yes		
17	Flat and relatively short fingers.	1	Seen in all Archaics and many modern humans.	Morphological	No	Yes		
18	Articulating flexible wrist that bend backwards	1	Seen In all Archaics and many modern humans.	Morphological	Wrist abduction not seen in Gorilla	Yes		
19	Human ability to scull water propulsively side to side.	1	Observed from Swim School industry in All Humans	Behavioural.	No	Yes		

- ▶ **IGNORANCE OF SWIMMING, 1991 US NAVY STUDY: 6% OF AMERICANS COULD PASS SWIM COMPETENCY TEST: 300 YARDS OF FREESTYLE.**
- ▶ **ZERO CROSSOVER BETWEEN ACADEMICS AND SWIM INDUSTRY.**
- ▶ **SOCIAL MISCONCEPTIONS. WIDESPREAD BELIEFS CERTAIN RACES CAN'T SWIM.**
- ▶ **DOMINANCE OF THE “OUT OF AFRICA” THEORY.**
- ▶ **SWIMMING PERCEIVED AS AN UNNATURAL “TRICK”.**
- ▶ **RICH EVIDENCE OF ARCHAIC SWIMMING EVIDENCE IS OBSCURE.**
- ▶ **AQUATIC THEORY HAS BEEN SEEN AS ADVERSARIAL, NOT COMPLIMENTARY.**

- ▶ UNDERWATER (LITTORAL) FOODS, NEARLY ALL ARE EDIBLE.
- ▶ POWERFUL YEAR-ROUND POSITIVE REWARD.
- ▶ POWERFUL NEGATIVE CONSEQUENCE FOR NOT SWIMMING: DEATH BY DROWNING.
- ▶ TWO FACTOR: SELECTION IS EXPONENTIALLY POWERFUL.

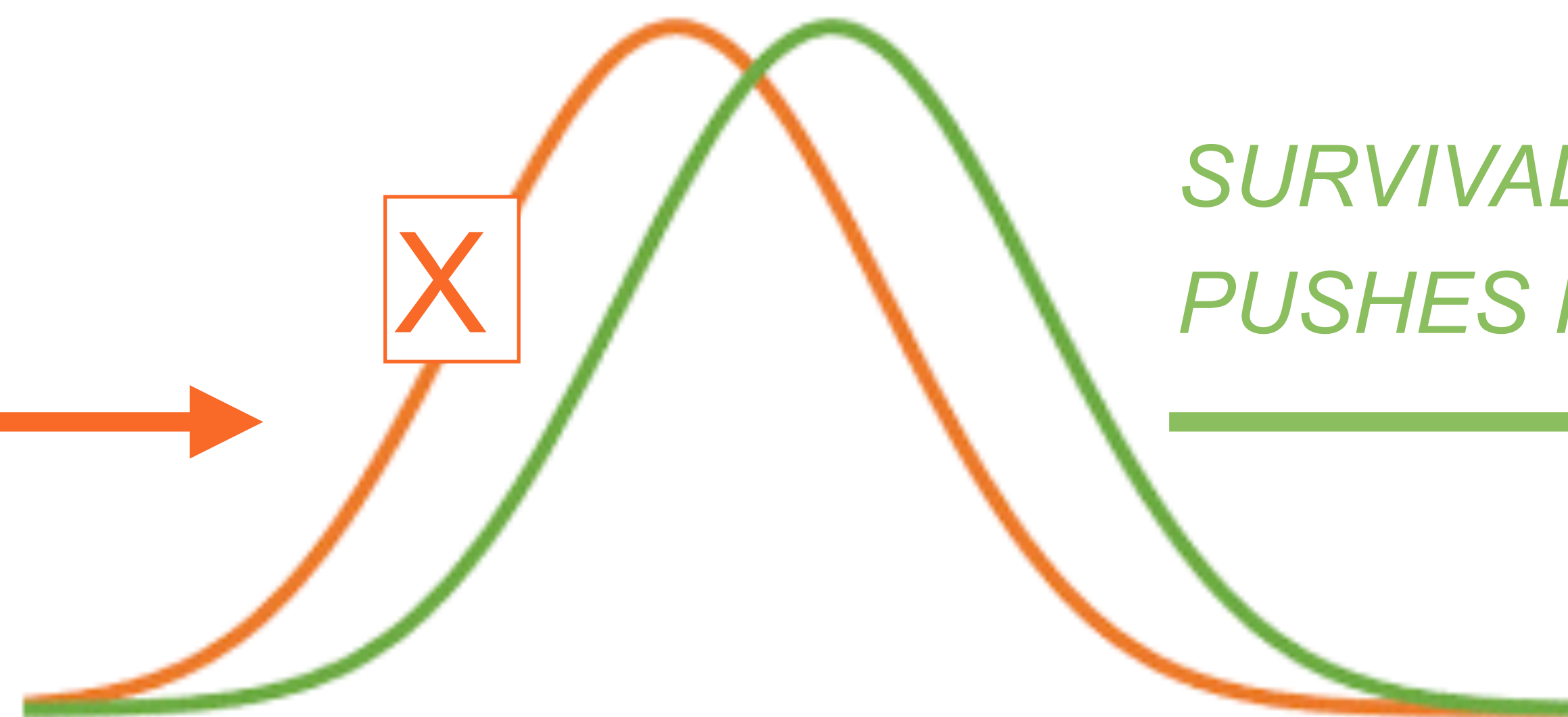
DROWNING:

A RIGHTWARD PUSH



SURVIVAL REWARD

PUSHES RIGHTWARD



— Original population

— Directional selection

PART 5: WHY WATER: CHIMP AVOIDS SWIMMING, HOMO EMBRACES IT, MASSIVE DIVERGENCE

- ▶ **CONVENTION: HOMO IS THE 3RD CHIMPANZEE (JARED DIAMOND 1991). (WRONG)**
- ▶ **GENETICALLY CLOSEST WITH CHIMP.**
- ▶ **BASED ON MORPHOLOGY, WE ARE MOST DIVERGED FROM CHIMP. (SCHWARTZ AND GREHAN 2010)**
- ▶ **UNIQUE AFFINITIES 35 WITH ORANG, 11 WITH GORILLA, ONLY 2 WITH PAN.**
- ▶ **CHIMP IS THE LEAST AQUATIC OF THE APES.**
- ▶ **HOMO IS THE ONLY SWIMMING APE.**
- ▶ **THERE IS A THEORY EXPLAINING THIS ANOMALY.**

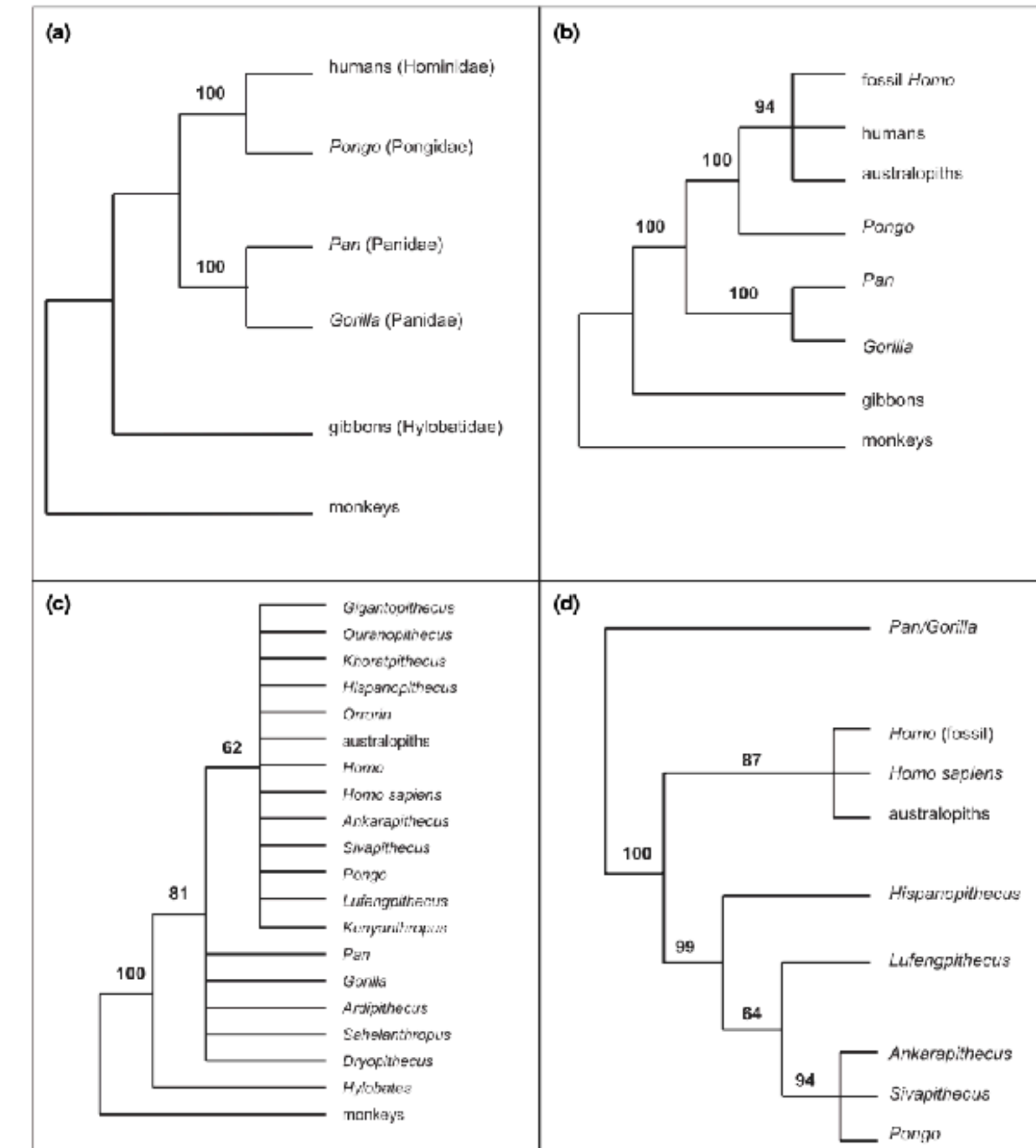


Figure 2 Phylogenetic relationships and bootstrap values for living and fossil large-bodied hominoids. (a) Single most parsimonious tree for extant large-bodied hominoids supporting the monophyly, respectively, of humans (Hominidae) and orangutans (Pongidae) and of the African apes (Panidae). (b) Consensus tree for large-bodied hominoids supporting the monophyly of living (humans) and fossil hominoids (*Homo*, australopithecus) as the sister-group to orangutans. (c) Consensus tree supporting the monophyly of hominoids and various Miocene-Pliocene fossil apes and orangutans into a 'dental-hominoid clade', with the African apes as a sister clade along with the putative hominoids *Ardipithecus* and *Sahelanthropus*. The heuristic search was made with a random seed = 100, replicates = 50,000, saved trees/replication = 10, tree bisection-reconnection (TBR) option and replacement of existing trees. (d) Consensus tree for fossil and living large-bodied hominoids with fossil taxa limited to those with 14 or more shared character states as the maximum number of taxa providing resolution of relationships within the dental-hominoid clade.

Homo's Directional Adaptation Toward Swimming and Retaining Bipedalism

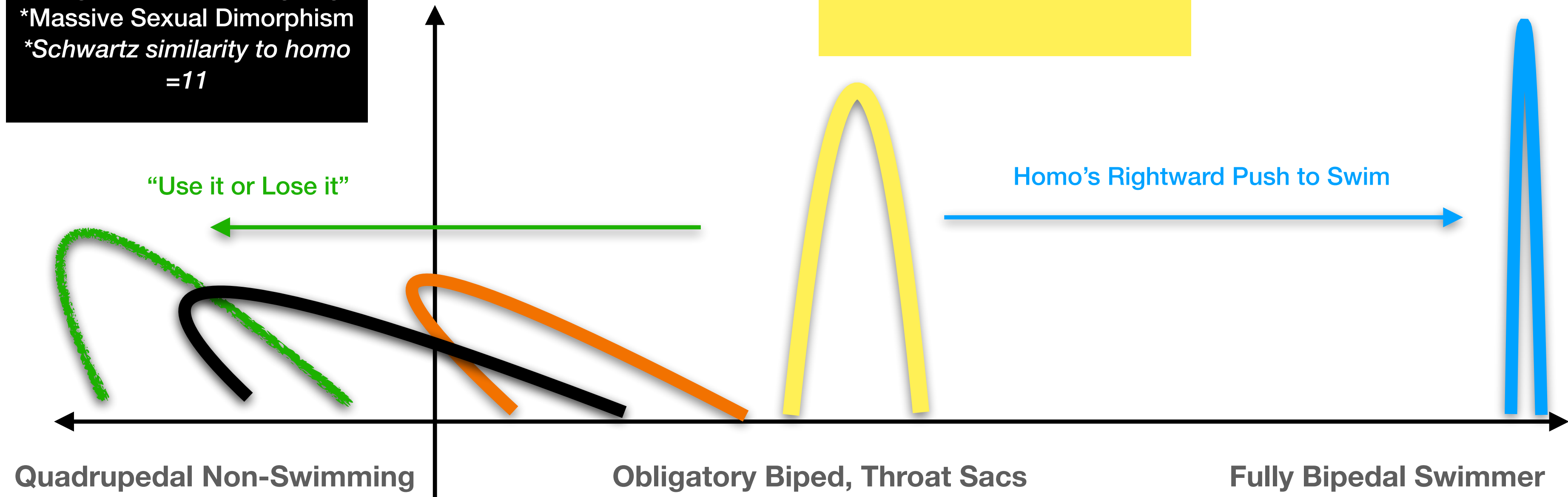
Green = Chimps
 *Non-swimmer,
 *Quadrupedal
 *Pack Hunter
 *No speech
Schwartz similarity to homo = 2

Black = Gorilla
 *Some wading,
 *Knucklewalking
 *Fusing of Lumbar type 1
 *90% in the trees.
 *Cognitive speech, Signing
 *Massive Sexual Dimorphism
Schwartz similarity to homo = 11

Orange = Orangs
 *Least changed over time.
 *Four handed
 *90% in the trees.
 *Limited speech
 *Never in Africa, SE Asia
Schwartz similarity to homo = 35

**Yellow = LCA to Homo, Chimp
 Orang, Gorilla was similar to
 Large bodied Hylobate:**
 *Monogamous
 *Claim territory in pairs
 *Duetting
 *Brachiating shoulders
 *Swing FAST! under Branch
 *Little Sexual Dimorphism
 *Twisting Lumbar Section.
 *Obligatory Biped on branch
 *Throat sacs
 *Never in Africa, SE Asia

Blue = Homo
 *Obligatory Biped
 *Duetting, monogamous pairs
 *Swimmer/ Diving gatherer
 *Skilled Hunter
 *100 Aquatic Adaptations
 *3x Brain capacity to chimp
 Rightward push is 10x to 100x
 that "scientific community"
 grasps.



- ▶ **EVERYONE CAN SWIM, IT'S A HUGE INDUSTRY.**
- ▶ **WE HAVE MANY ADAPTATIONS TO SWIM, THE NOSE ON YOUR FACE.**
- ▶ **POSTERS SHOWING TOP 20 ADAPTATIONS.**
- ▶ **DROP HINT, THERE IS A RACIST ELEMENT IGNORANCE ON SWIMMING.**
- ▶ **ARCHAIC HOMO: 100% OF LITTORAL FOODS ARE EDIBLE, INEXHAUSTIBLE.**
- ▶ **ARCHAIC HOMO: SMALL % OF LAND PLANTS ARE EDIBLE, SEASONABLE.**
- ▶ **ARCHAIC HOMO CROSSED MILLIONS OF RIVERS,**
- ▶ **BONOBO AND COMMON CHIMPS CAN'T CROSS ONE.**
- ▶ **A SINGLE UNCONTROVERSIAL PAPER IN A STRATEGIC JOURNAL.**

PART 6: SEEING AQUATIC ADAPTATIONS: COVER ART



The Yet-to-be-explained Aquatic Adaptations In All Humans



- Adaptations seen in Aquatic Mammals**
1. Vernix Mucosa Lanugo hair in Newborns.
 2. Paranasal Sinuses.
 3. Parasagittal Keeling, Heavy Eyebrows
 4. Complete Loss of Underfur
 5. Abnormally Large Brain, seen in aquatics
 6. High Salt Fluid secreted as sweat.
 7. Kidneys capable of drinking brackish water
 8. Digestion of High salt foods.
 9. Automatic tears, emitting salty water
 10. Ear Exostoses, in Modern and Archaic Homo
 11. Infant swimming reflex, righting, floating
 12. Cold water gasp reflex.
 13. Low pH in birth Canal,
 14. Menopause, seen only in Orca
 15. Hymen in to human women.
 16. Very thick tooth enamel.
 17. Near complete Loss of Apocrine glands
 18. Universal Swimming, water play, ritual baths
 19. Distance swim feats, Modern and Archaic
 20. World-wide Shell Midden sites, 165,000 years
 21. Mass catch and butcher of fish (and)
 22. Cooked fish sites 850,000 years ago.

Photo: Simone Manual Olympic Freestyle Champion: 5x Olympic Medals. 16x World Championship Medals

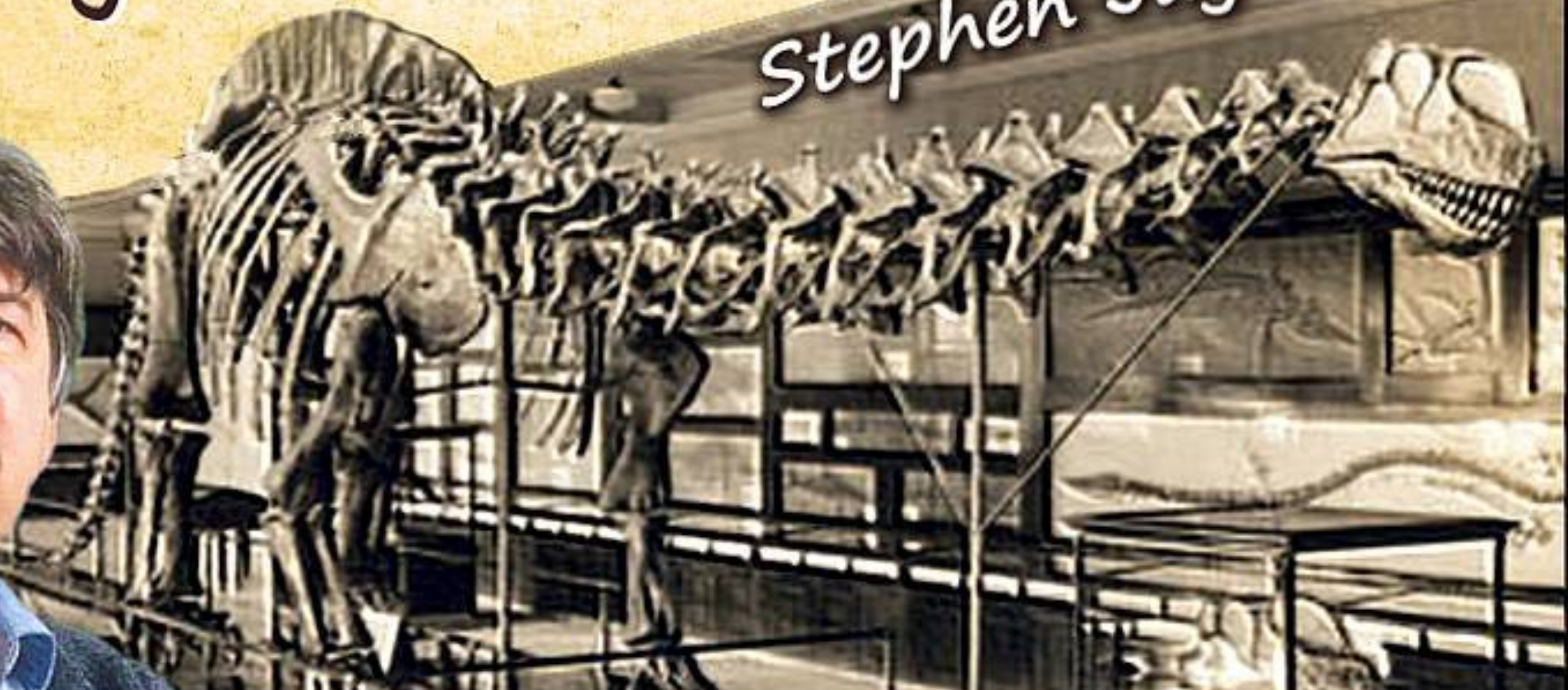
PART 7: ACADEMIC PAPER DEFINING AQUATIC ADAPTATIONS

- ▶ **ABSTRACT: HUMANS SWIM BECAUSE OF PROFOUND SWIMMING ADAPTATIONS.**
- ▶ **OBSERVED IN ALL ARCHAIC AND ALL MODERN HUMANS.**
- ▶ **WELL DEFINED SWIMMING INDUSTRIES; SCHOOLS, SPORT, PARKS, OLYMPICS.**
- ▶ **AUTHOR: 40 MILLION LESSONS OVER 35 YEARS, ALL HUMANS CAN SWIM EQUALLY WELL.**
- ▶ **LIST TOP 20 ARCHAIC EVIDENCES FOR SWIMMING.**
- ▶ **LIST 20 MODERN EXAMPLES OF WORLD WIDE SWIMMING.**
- ▶ **PRESENT 100 POSSIBLE AQUATIC ADAPTATIONS, EVALUATE.**
- ▶ **RELATE OBSERVATION TO OTHER GREAT DISCOVERIES, COPERNICUS, GALILEO, ROENTGEN, CURIE, EINSTEIN.**
- ▶ **WE MUST RESOLVE SWIMMING ADAPTATIONS.**



Honorable errors do not count as failures in science, but as seeds for progress in the quintessential activity of correction.

Stephen Jay Gould



A close-up photograph of a baby's face and hands underwater. The baby is smiling broadly, showing their teeth. Their hands are near their chest. The water is clear and blue. The text "LOVE WATER" is overlaid in large, bold, yellow letters across the middle of the image.

LOVE WATER[®]