

# 'Science Newsletter'

## The history of veterinary medicine

Earliest records of veterinary medicine go as far back as 3000BC in Mesopotamia to the stories of Urlugaledinna who was said to be an 'expert in healing animals', however it was not until 1761 in Lyon, France, that the first veterinary school was established by Claude Bourgelat. Not many years later, in 1785, Britain began the discussion of improving the 'study of farriery upon rational scientific principles', and, in 1791, the London Veterinary College was founded and started to develop the science of veterinary and the idea of a profession specifically dedicated to animal medicine. The early days of this British development was heavily focused on the horse, as they were a critical part of the Army and warfare, but over the years this has shifted towards livestock and pets.



## Fun pet fact

Goldfish can live up to 40 years!

## Discovery of 'smallest reptile on earth'

The smallest ever recorded reptile has been found in North Madagascar, and its body is just 13.5mm long, with a 22mm tail. There were only two specimens of this subspecies found by the German-Madagascan expedition team who discovered them, and it has further been named the *Brookesia nana*, or nano-chameleon.



This reptile is just a few millimeters smaller than the *Brookesia micra*, and has a projectile tongue that is used to capture prey on the rainforest floor during the day, after which they safely return back into the blades of grass at night. Being so small,

B. nana has a much larger surface area to volume ratio than bigger animals, meaning that it's more prone to water loss, and also has the challenge of how to fit all of its organs into such a small body, so perhaps the future of discovering more minute reptiles is limited. Unfortunately, the tiny reptile could be pushed into extinction due to deforestation of its habitat, which threatens around 94% of forested land in Madagascar, but the Brookesia's rainforest home has now been included in a protected area, so may have another chance at survival. However, much of the Madagascan deforestation has been caused by an increasing population and growing poverty in the area, so until the economic situation has been shifted, it will be hard to prevent all wildlife degradation, as many people need to use the land in the rainforest to provide space for livestock and agriculture.

*Cecelia Cardozo*

## **One Step closer to wiping out Polio**

Polio is a deadly disease caused by the poliovirus which can lead to paralysis. Polio was originally discovered in 1784, and the first epidemic outbreak took place in 1984 in Vermont, USA. In the late 1980s wild poliovirus paralysed more than 1,000 children a day. The majority of people that become infected with poliovirus are asymptomatic, while some have flu-like symptoms, but about 1/200 become paralysed. The effect of polio is found mostly in children throughout under immunised communities with poor sanitation.

Once infected, polio can not be treated, it can only be prevented with the use of vaccines. There are three types of wild poliovirus (WPV), conveniently named type 1, type 2 and type 3. There are two types of polio vaccinations, an oral vaccine and the injection of an inactive virus, both of which protect people from getting any type of polio. Type 2 and 3 WPV were declared eradicated in 2015 and 2019, respectively. Type 1 WPV is the only one that is still present. The eradication of polio has come a long way, there are currently less than 200 cases in only two countries: Afghanistan and Pakistan. Africa was declared free of WPV in August 2020 and more than 95% of the continent's population has been immunised. For Polio to be completely eradicated, more than 80 percent of children need to be vaccinated.

## Why hasn't polio been eradicated already?

There have been several interruptions and difficulties throughout the process of getting vaccines to the children that need it. Most of these children live in areas that are unsafe and hard to reach, and a lot of their parents or care-takers are misinformed about vaccines. The lack of vaccination education is a massive problem especially in underdeveloped or developing countries, but there are organisations such as Unicef and GAVI, the vaccine alliance which aim to increase access to immunisation in poor countries.

## A new polio vaccine

On November 13th 2020 the World Health Organisation (WHO) granted emergency use for a new polio vaccine. Scientists believe that the new vaccine will “hopefully take us to the finishing line of polio eradication”. The first outbreak of a vaccine-derived polio outbreak occurred in Haiti and the Dominican Republic about twenty years ago. It occurred in areas with low elimination and scattered in the stool of those who were immunised. There are few vaccine-derived outbreaks these days, most of which are found in Afghanistan, Pakistan and African countries. Many of these outbreaks are linked to vaccine virus type 2. Scientists believe that the way to stop this new vaccine virus is with the new oral vaccine which contains a weakened type 2 virus, hence its name ‘Novel Oral Polio Vaccine type 2 (nOPV2). The expectation for this new oral polio vaccine is that the modifications made from the first one will slow the evaluation of the new vaccine virus enough to end the existing outbreaks without creating new ones.

WPV - poliovirus that are not attenuated (reduced in effect)



Epidemic - a widespread occurrence of an infectious disease in a community at a particular time

### **Women in STEM: Jewel Plummer Cobb (1924 - 2017)**

Jewel Plummer Cobb was an African American cell biologist, cell physiologist and cancer researcher, she is mainly known for her work with melanin. Cobb's research included investigating the relationship between melanin and skin damage. She began this research on the effects of chemotherapy drugs on cells infected with cancer, and was particularly interested in melanoma, a type of skin cancer. She discovered that methotrexate (a synthetic compound that interferes with cell growth) was effective in the treatment of some skin cancers, lung cancers, and childhood leukemia.

As well as advancing the understanding of the relationship between melanin and cancer, Cobb was an advocate for women and people from ethnic minorities to pursue careers in the sciences. Growing up in Chicago, Cobb was very aware of the problems of racism and segregation in the education system, and although she was forced by segregation to study less academically rigorous courses, Cobb was determined to not let that discourage her. The first university that she attended was the University of Michigan, which she left soon after because of its history of discrimination. She moved to Talladega College, an HBCU (historically black college and university), where she earned her B.A. in biology. Cobb then took up a teaching fellowship at New York University. After initially being rejected because of her race, she had to visit the school with her documents and was eventually invited for the position. She received her M.S. in cell physiology in 1947 and Ph.D. in 1950. In 1952 she founded a laboratory at the University of Illinois medical school, the first tissue culture-based lab at the medical school. In her efforts to encourage women and underrepresented minorities to enter science-based careers, Cobb established pre-medical and pre-dental programs, she also formed a tutor program to support students that were struggling in math and science classes, as she realised that much of the discrimination in STEM occurred before students even attend college.

When asked in a 1990 interview with the Association for Women in Science how she would like to be remembered Dr. Jewel Plummer Cobb responded, *“I think I’d like to be remembered as a black woman scientist who cared very much about what happens to young folks, particularly women going into science.”*

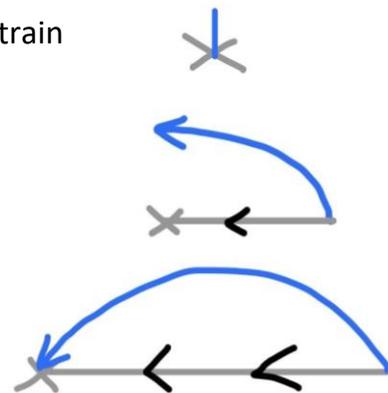
*Ogo Elumelu*



### Moving train concept

If a train is moving at a constant velocity and you stood inside a carriage and jumped you would land in the same place on the train, but if you stood on top of the train and jumped you would go backwards, landing behind the spot you initially jumped from.

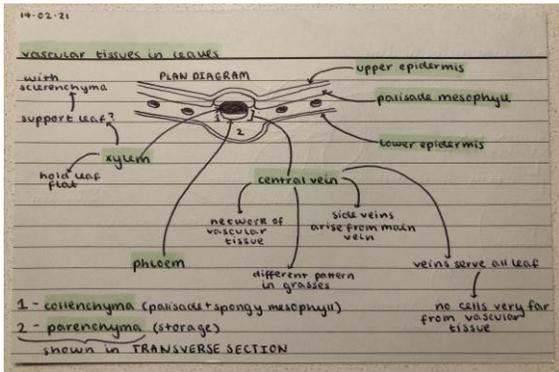
Inside the train carriage you have the same speed as the train itself (as the train is carrying you), so when you jump you don't jump straight up, you jump forward with the train's speed pushing you. And as you jump the train is still moving, so the place you initially jumped from moves forward too, at the same speed you are moving. So you end up landing on the same spot on the train.



But on top of the train air resistance is pushing against you, and the faster the train is moving, the stronger the air resistance. So when you're on top of the train the same thing happens as inside a carriage, but the air resistance is so strong that it pushes you back.

*Rachel Heffernan*

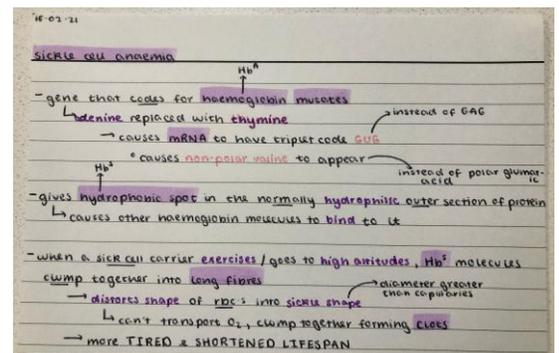
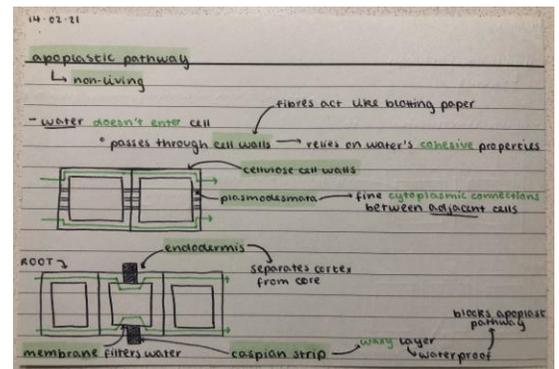
## Biology revision tips



When the time comes around for revising Biology, often the first step is to make your revision notes - this can be a valuable and sometimes vital part of ensuring that you cover all the required topics for your test. I find that making these notes helps me to consolidate all the facts I need to know (particularly in a content heavy subject, such as Biology), whilst also giving me time to work out any tricky parts that I never really got my head around the first time they were taught. I thought it might be

useful for those in younger years to just see an example of one of the many ways to begin your revision! The best thing I've found is to try as many different methods of revising for each test that you have in order to find what works for you. Here are my top tips:

- Assemble your resources (textbook, class notes, revision websites)
- Choose what to write on and the colour for that topic (flashcards, paper, computer/iPad if you prefer but handwritten notes usually help with learning)
- While working through the spec, cover the hardest topics before the ones you find easier
- Only highlight the most important words, and change colour for keywords (the ones that give you marks)
- Try not to cram lots of information into one section by spacing points out
- Try and finish making your revision resources early on and start doing practice questions



## Name competition!

Have any good science newsletter name ideas? Email [olumelu15rb@stcatherines.ingo](mailto:olumelu15rb@stcatherines.ingo) or [c-cardozo15rb@stcatherines.info](mailto:c-cardozo15rb@stcatherines.info) for suggestions and the best name gets an edible prize!

## Recommendations

**Books:** The Selfish Gene by Richard Dawkins

**Docuseries:** 'Unnatural Selection' on Netflix (16+)

## Sources

History of veterinary medicine - <https://knowledge.rcvs.org.uk/heritage-and-history/history-of-the-veterinary-profession/>

Oldest goldfish ever recorded

<https://www.guinnessworldrecords.com/products/books/superlatives/oldest>

Discovery of Brookesia nana

<https://www.nationalgeographic.com/animals/2021/01/tiny-chameleon-smallest-reptile-discovered-madagascar/>

<https://www.bbc.co.uk/news/world-africa-55945948>

Polio

[new-polio-vaccine-eradicate-paralyzing-disease-outbreaks](https://www.unicef.org/immunization/polio)

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