St Benedict's LSC

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(including the History & Philosophy of Science)

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St Benedict's Catholic School

The Catholic Secondary School for West Suffolk

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EDITOR'S NOTE: Welcome to the second edition of Volume 3.

There is a broad spectrum of work in this edition, ranging from mysterious life in the deep ocean to a plant rap! Along the way you will read about a famous scientist who first proposed the theory of *Continental Drift*; missions to Mars…and more.

2019 is the 50th anniversary of Man's first steps on the Moon – Apollo 11. That happened on the 20th July 1969 and was the culmination of a number of test flights. The previous Journal had a back-page feature on Apollo 8 which, at Christmastime 1968, carried three astronauts into orbit around the Moon for the very first time and then returned them safely back to the Earth.

This edition, being published in April, can mark the 50th anniversary of the next Apollo mission: Apollo 9, which actually flew in April 1969. This flight was hugely important – it didn't go to the Moon but stayed in Earth orbit for 10 days and tested a number of critical systems and manoeuvres, including backpack life support systems and navigation systems.

However, the most important tests involved the first ever flight of the craft that would eventually land on the Moon, the LUNAR EXCURSION MODULE (LEM).

The LEM looked a most unlikely spacecraft as it had no aerodynamic characteristics at all. However, it was designed and built to operate in the vacuum of space and, of course, the Moon itself was known to have no atmosphere. The Apollo 9 LEM was appropriately named SPIDER!

After 10 days in orbits and all aspects of the mission successfully completed the crew returned to Earth in the COMMAND MODULE. SPIDER, however, could not be returned and was allowed to burn up as it re-entered the atmosphere.

Apollo 10 followed in May 1969 and then there was that momentous flight of Apollo 11 in July when Neil Armstrong became the first person to set foot on the Moon, closely followed by fellow crew member, Buzz Aldrin – the Journal will bring you more of this story in its July edition.

Like the month of January (last edition), April has its beginnings in Ancient Roman times, although the exact derivation of the name is open to question. The Latin verb 'to open' is *aperire,* which is plausible as April is the spring month when the flowers and trees start to open and blossom.

An alternative theory is that, since months are often named after gods or goddesses, April may be derived from the Greek goddess of beauty, *Aphrodite*. Or.....

It could have been the Anglo-Saxons who, around the 5th century AD, referred to the fourth month of the year as *ēastre-monaþ* after the goddess *Eostre,* whose month it was.

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LIFE IN THE OCEANS

Charles Bushell 7NOX (Humanitas)

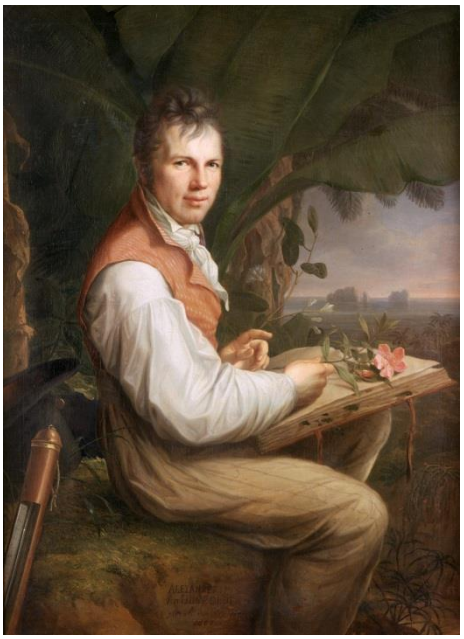
This spider crab sheds its exoskeleton every year in the same spot as all of the other spider crabs, but gathering in such big groups like this, attracts predators. One of these predators is the Stingray. Once they have finished their gathering they all return to the depths to feed.

Many mistake this for being a plant when actually it is a living, breathing animal. During the day they catch algae on polyps. At night they grow but if two corals meet they have to fight to the death. When these fights occur the winner is the one that can digest their opponent the fastest. Each other's polyps extrude their guts on top of their opponent and all the evidence that this fight took place is two white skeletons one small, one big.

This is a perfect example of a deep sea fish. With its massive eyes that can see up to 3-4 metres in the twilight-midnight zone. Another brilliant use of the eyes is to spot prey/predators.

Some other deep sea creatures use camouflage: the colours they use are, well, none because they are transparent all the way through! But some animals do use colours, eg., navy and dark blue, sometimes black.

The Humboldt squid cannot live in captivity. They flash red to communicate with each other. It is newly discovered that they are cannibals, due to a camera investigation run by Brady Barr. He discovered that the squid saw the camera's light as a threat so he and his crew turned the light off; but the Humboldts still attacked.



Charles Bushell's paper (previous page) describes a sea creature called the **Humboldt squid**. It happens to be named after one of the world's most famous explorers – **ALEXANDER von HUMBOLDT** – and this year also happens to be the **250th anniversary of his birth**.

His full name is actually **Friedrich Wilhelm Heinrich Alexander von Humboldt**.

Born in Berlin on the 14th September 1769, he became a true polymath – naturalist, geographer, geologist, botanist, meteorologist, explorer and a proponent of the modern philosophy of science.

In 1799, at the age of 30, he set out on a monumental expedition to the Americas. Together with the botanist, Aimé Bonpland, Humboldt spent five years touring Venezuela, Cuba, an area of the Andes, Mexico, finally ending up in the United States.

After returning home to Europe he spent the next 20 years or so writing up his observations in what would become a multi-volume treatise he called ***KOSMOS***.

Humboldt saw the need for an approach to science that could account for the harmony of nature among the diversity of the physical world. Humboldt proposed that there is a "unity of nature", ie., an interrelation between the physical and natural sciences that determines the myriad of habitats and landscapes that he encountered on his travels. He viewed the whole of nature holistically and attempted to explain natural phenomena without appealing to religious dogma.

One result of Humboldt's holistic outlook on the natural world was the fact that he was able to see things that other people didn't; a typical example being his observation of severe soil erosion in European colonies and linking it to the practice of deforestation in order to maximise crop yields. He even went some way towards predicting human-induced climate change.

IF I WERE PRIME MINISTER:
A speech about the future of energy production

Ciaran Adams 7CKD (Caritas)

What the future for energy generation should be is a very hard decision to make because of a number of things, including other people's ideas – but I have to come up with my own idea and I am happy to share it with you.

"Okay, so I am focused on wind turbines and offshore wind farms – for example, like the one off the coast at Cromer. They started to build wind farms offshore after people started saying they looked ugly onshore. They will also ensure new jobs for people in the UK.

I am not too sure about fossil fuels because them polluting the air; so fossil fuels are not a choice for me.

Solar farms can be anywhere, although they do take up a lot of valuable space. The farms need to be near major cities in the UK, but the problem is that normally these cities are full of houses and buildings and there is not enough space. The solar farms would be good in assisting the power network.

Nuclear energy is very expensive and costly to decommission at the end, but it may be needed until solar and wind can produce more energy for the UK."

What about NUCLEAR ENERGY – is it the future, or not?

Nuclear technology using the energy released by splitting the atoms of certain elements (nuclear FISSION) originated in the 1940s and led, initially, to the production of atomic bombs, two of which were used in 1945 against the Japanese cities Hiroshima and Nagasaki.

In the 1950s attention turned to the peaceful use of nuclear fission by controlling it for the generation of electricity. The first nuclear reactor to produce electricity (albeit a trivial amount) was the small Experimental Breeder Reactor (EBR-1) designed and operated by Argonne National Laboratory and sited in Idaho, USA. The reactor started up in December 1951. In 1957 the US Atomic Energy Commission completed a 60MW reactor at Shippingport, Pennsylvania.

The first fully commercial reactor generating 250MW was designed by Westinghouse and built at Yankee Rowe, Massachusetts – it started online in 1960. The Russians, in competition with the USA, were also at the forefront of nuclear technology and the nations of Western Europe, especially France, also built up significant electricity generation from nuclear fission reactors.

In the mid-1970s it seemed that the future for electricity generation lay in the nuclear option; but then, in the late 1970s, the nuclear power industry worldwide began to suffer decline and stagnation. This was due to a number of factors, eg., inefficient reactors, expensive building and generating costs, environmental impact of radioactive waste. However, the industry began to recover after 2000 when it became clear that the world's demand for electricity was outpacing abilities to produce it and, crucially, there was an acceptance that the burning of fossil fuels had to be reduced in order to bring carbon emissions under control for the sake of global warming.

Whilst not on its own providing a solution to the world's future energy requirements, there is a view that nuclear does have an important role to play.

ALFRED WEGENER

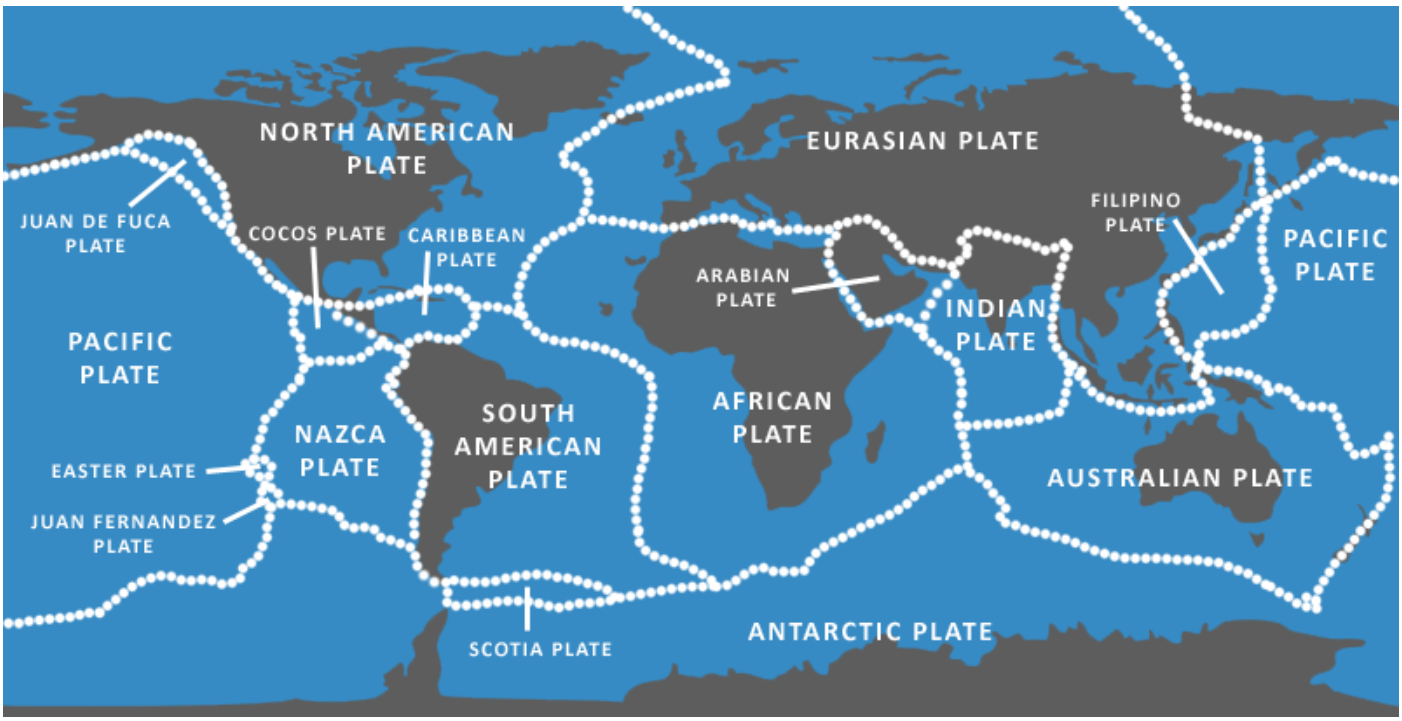
Oliver Hill 7NOX (Industria)

Alfred Wegener was a German polar researcher and geophysicist (he studied the physical properties of the Earth). In 1912 Wegener suggested that the Earth's continents were once joined together. He thought that about 335 million years ago there was a supercontinent called Pangea. Wegener believed that Pangea began to break up 175 million years ago forming the continents as we know them now. This is called the Theory of Continental Drift.

Wegener did a lot of research to try to prove his theory because he knew people wouldn't believe him. He looked at the shape of the continents their rock types and their features for example valleys and river channels. Wegener found that the west coast of Africa matched with the east coast of South America. He said they fitted together "like the two halves of a torn newspaper".

Wegener suggested that the continents ploughed through the floor of the ocean like a ship cutting through ice. This idea was not believed by other scientists because there was no evidence of the floor breaking up. When Wegener died in 1930 most scientists still did not believe his theory.

In the 1950's and 60's scientists invented new technology which proved Wegener's theory was mostly true. There was a supercontinent that broke up to form modern earth as it is now. However Wegener was wrong about the way the continents moved. They did not plough through the ocean floor but instead the earth broke up into large tectonic plates including the ocean and continental crust which move together.



A map showing tectonic plates

ALFRED WEGENER

Clotilde D'Mello 7WRB (Patientia)

Alfred Wegener was a German scientist who was the first to have the theory about continental drift in 1912.

What was his theory?

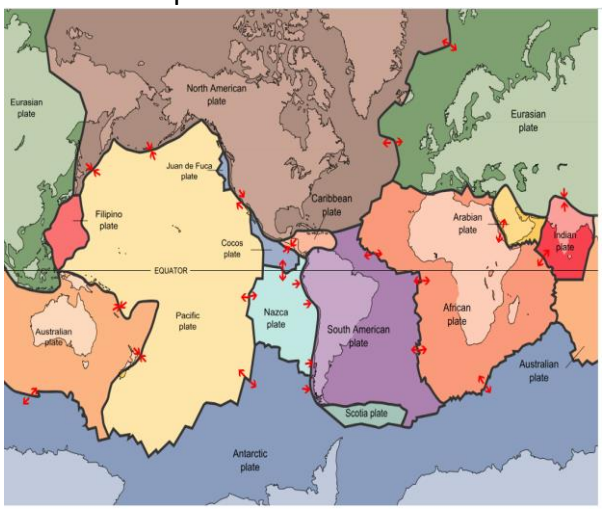
His theory was that once upon a time the whole world was on super continent and that over millions of years they separated to where they are right now.

Continental Drift:

Alfred Wegener first proposed his theory of the **continental drift** in the beginning of the 20th century. Before Wegener developed his theory, it was thought that mountains formed because the Earth was cooling down, and, as it cooled down, it contracted. This process formed wrinkles, or mountains, on the Earth's crust. If this was his theory, there would be mountains evenly spread across the planet; however, his theory of the continental drift changed this view.

He also thought that mountains were the border of the plates. This was true when India came in contact with Asia but otherwise it did not work.

The tectonic plates…



A lot of close examination of the planet often results in the observation that most of the coast of South America and that of the continents seemed to fit together like a puzzle (a supercontinent): the west African coastline seemed to fit into the east Caribbean Sea; a similar fit appears across the Pacific.

EDITOR'S NOTE: As is so often the case with radical new theories, the proposer is often disbelieved, or even downright ridiculed – so it was with Alfred Wegener. He perished in a blizzard during an expedition to Greenland in 1930 and it would be another 30 years before his theory would become accepted. His main problem was that he could not explain exactly how the continents could drift; however, by the mid-1960s, from a variety of sources the theory of PLATE TECTONICS was developed that would fully explain how Wegener's theory would work!

META – a personal tale

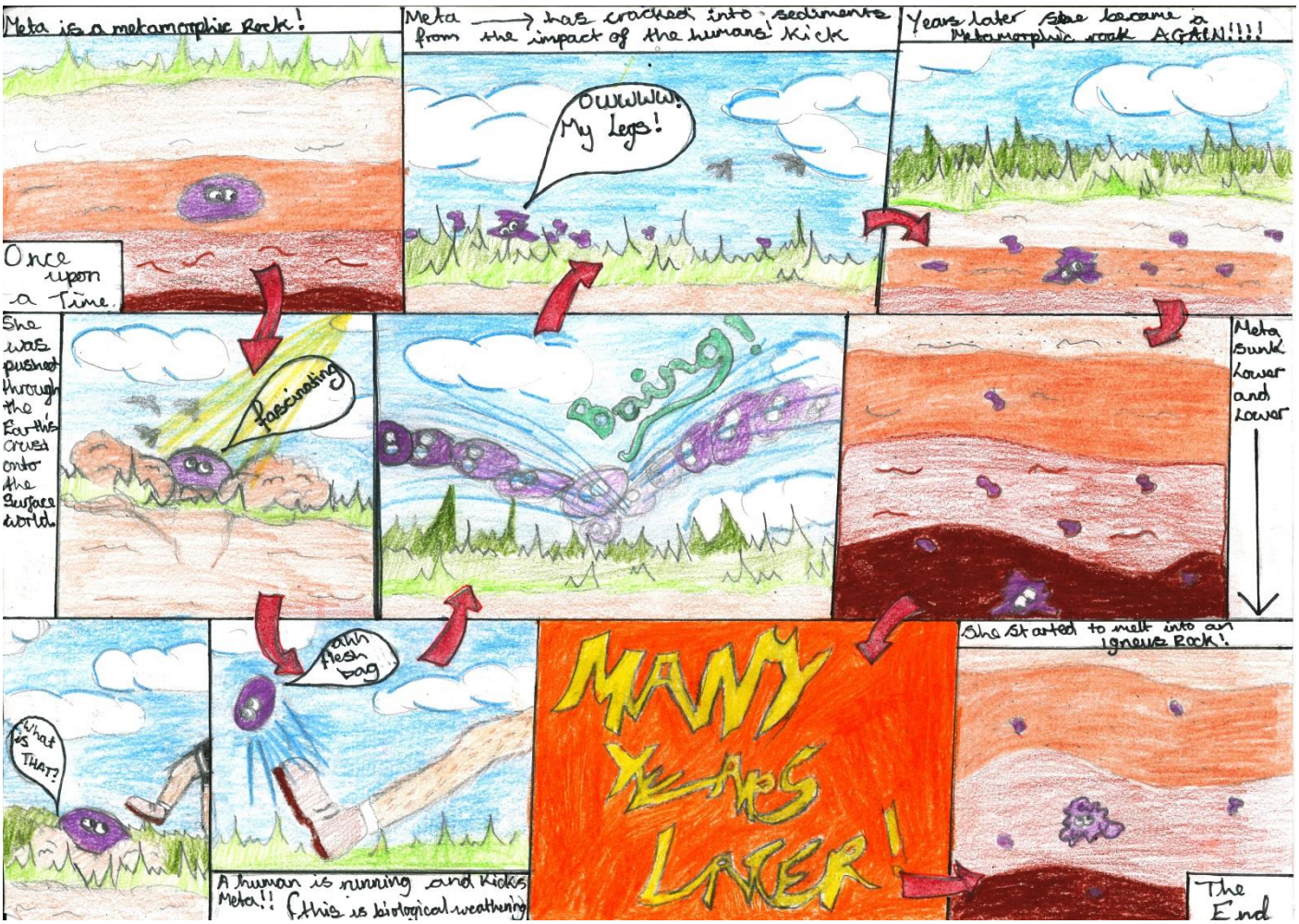
Jagoda Napieraj 7CPR (Caritas)

Once upon a time there was a tiny metamorphic rock called Meta. I am Meta!

One day I was pushed through the Earth's crust towards the surface world. It was fascinating. I slowly started to get used to the surface world, but then a monstrous, fleshy monster came hurtling towards me and sent me flying across the beautiful landscape I was surrounded by; however, the impact from this flesh bag caused my body to crack and chip, giving me uneven edges.

After many years had gone by and I still lay there, nothing interesting had happened during this period of time. I laid there……I just laid there until an immense amount of pressure hit me and began changing me!

It was a strange experience because I had started out as a metamorphic rock but, now, it feels like I'm slowly melting away. I have the feeling that I might become an igneous rock next!



The oldest rocks on Earth are metamorphic rocks

Although there are many candidates for the title *"the oldest rock on Earth"*, it is widely reported that the winner is the **ACASTA GNEISS** from the Canadian Northwest Territories at just over 4 billion years old.

Gneiss (pronounced 'nice') is a common type of metamorphic rock formed by high temperature and high-pressure metamorphic processes acting on formations composed of igneous or sedimentary rocks.

A HOLIDAY TO MARS (courtesy of NSTC)

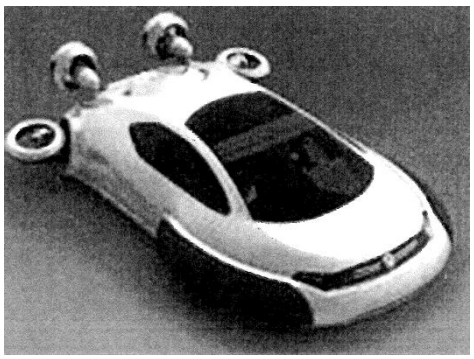
Nathan White, Sam Sablevicius, Taylor Stephenson, Christopher Cummins

WHAT IS THERE?

On behalf of NSTC (the National Space Transportation Council) we invite you to take a brief moment to imagine Mars, a great big planet with dangers such as acidic poisoning and carbon dioxide contamination – scary, isn't it?

Don't worry, NTSC has made it acid proof and safe for your stay, so suggest to yourself what you and your family will do on Mars: swim?; stay in a hotel?. Our holiday resorts will include these and much more for your limitless dreams and endless activities.

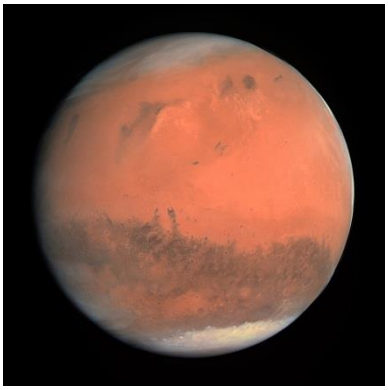
TRANSPORT ON MARS



Your transport on Mars will be supplied to you as hover cars. These cars will allow you to drive all over the planet as they are designed to drive smoothly and steadily over the Martian ground.

THE PRICE!

This holiday will cost a lot of money - £100,000 for just one night. This includes meals, water, shelter and a hotel room. If you want to stay more than a fortnight, prices will steadily increase.



HOW ARE WE GETTING THERE?

Normally it takes two years to travel to Mars, but our state-of-the-art rocket only takes one day. You will be given food and water for the transportation to the planet.

To send a spacecraft all the way to Mars, you first need a fast rocket to escape the pull of earth's gravity. The heavier your spacecraft, the more powerful your rocket needs to be to be able to lift off. Secondly, you have to make sure that you launch at the right time because Mars and Earth orbit the Sun at different speeds and distances.

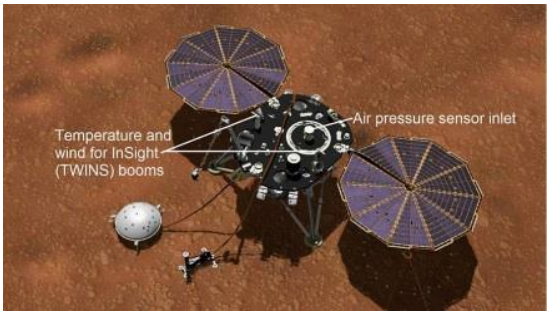
WHY ARE WE GOING THERE?

We want to go there mainly because of a holiday that will be breath taking and heart stopping. We also want to go there to find out about new resources, backgrounds and lifestyles that will help create a new population as, on earth, our current numbers are overfilling the world.

PLANNING A HOLIDAY TO MARS? DON'T FORGET TO CHECK THE WEATHER!

NASA has recently announced that it will be providing a daily weather report from Mars. The data for the report is being collated and transmitted to earth via NASA's **InSight** lander.

The lander is located at **Elysium Planitia**, a flat, smooth plain near Mars' equator. Weather reports will give the temperatures, winds and atmospheric pressures, just like here on Earth.



A HOLIDAY TO MARS (courtesy of ISA)

Patryk Jasinski, Keith Gamboa, Julian Blady and Oscar Mulligan

Cost Of The Flight

As this event is sponsored by SpaceX, we have all agreed on making this flight significantly cheaper.

We have a variety of packages that will be displayed on the next page for everyone to view. These will be separated from cheapest to most expensive. However, certain packages offer more security and luxury than others, thus, making your stay at Mars a whole different experience

Transportation

Explained ,In Detail, By Head Scientist Of ISA

"We have tried our best to make our ships as comfortable as possible, with a lot of leg space and a food bar, the flight is short and is only 10 days. We have provided all of the necessary food and beverages for the flight. However it comes with a charge. Do not worry as it is only a bit more priced compared to food from earth. We have made each ship to hold 200 people. In the 10 day period we will be making a short stop at our nearby space station, located near the moon, to refuel our transport. In the moon we will be staying there for 10 hours and you will be able to go out and explore the moon. We would have to reach 300,000 KPH to get to mars in 10 days. We have developed a simulation capsule, that you will require to be in for the majority of the flight. This simulation capsule makes you feel like you are on earth."

Introduction To ISA

ISA

Future Is Held With Us

ISA Director: Patryk Musk

ISA Head Scientist: Kieth Gamboa

ISA Assitant Manager: Julian Blady

ISA Head Engineer: Oscar Mulligan

Common Questions

1. Is Your Space Shuttle As Safe As You Assure It To Be?:

Yes!, Our Space Shuttles Have Underwent 2 Flight Test. They Passed With An A*. After each test, we refurbish them and renew the components. Customer Safety Is Our Top Priority!.

2. What If We Crash Land On A Different Planet?:

That Is Very Unlikely When Flying With ISA. However, in the emergency we have a space station with Multiple Search & Rescue ships ready to be launched. All full of First Aid Kits and MRE's

3. How Long Is The Flight To Mars?:

The Flight To Mars Is 10 Days With The Top Tier Technology, As Ours, However, We will need to stop along the way to refuel our convoy and rest the flight crew.

Sales Packages

Poor Peoples Package - $500: Comfortable Seats, Limited Food Bar Card, Simulation Capsule, Suite At ISA's Mars Hotel.

Average Peoples Package - $1500: Comfortable Seats, Unlimited Food Bar Card, Simulation Capsule, Reserved Seats For Emergency Shuttle, Suite At ISA's Mars Hotel

Celebrity Package - $2500: Comortable Seats, Unlimited Food Bar Card, Simulation Capsule, Reserved Seats For Emergency Shuttle, Luxurious Penthouse Suite At ISA's Mars Hotel, ISA's Mars Automobile.

Airpod Users Package - FREE, Only If You Own Authentic Apple Airpods: Comfortable Seats, Simulation Capsule, Unlimited Food Bar Card, Reserved Seats For Emergency Shuttle, Luxurious Suite At ISA's Hotel, A Personal Butler, ISA's Mars Automobile, Personally Meet ISA's Director, Patryk Musk.

HIRING NOW

Are You Fascinated By Our Projects And Work?. Would You Love To Study Space And Space Travel?. Would You Love To Earn An Average Of $25,000 A Month?. Would You Love To Help Build And Present Future Projects?. Do You Want To Be The Respected Colleague Of Patryk Musk?, The Master Mind Behind ISA And Space Travel?

Give Us A Call To Discuss An Interview Date!.

If You Are Interested, Please Call

Tel: 666 666 666 666

CURRENT PLANS FOR A MANNED TRIP TO MARS

Isabelle Gammon 8SOA (Caritas)

NASA[1]

NASA continues to work with companies to address the challenges of living in space, such as using existing resources, options for disposing of waste, and more. Missions to the Moon are about 1,000 times farther from earth than missions to the International Space Station, requiring systems that can reliably operate far from home, support the needs of human life, and still be light enough to launch. These technologies will become increasingly more important for the 34 million mile trip to Mars.

Exploration of the Moon and Mars is intertwined. The Moon provides an opportunity to test new tools, instruments and equipment that could be used on Mars, including human habitats, life support systems, and technologies and practices that could help us build self-sustaining outposts away from earth. Living on the Gateway (a planned orbital outpost in the vicinity of the Moon) for months at a time will also allow researchers to understand how the human body responds in a true deep space environment before committing to the years-long journey to Mars.

UAE[2]

In the first Arab mission to another planet, the UAE Space Agency's Hope spacecraft is to launch in July 2020. The probe, which will study the Martian atmosphere, should land in early 2021, coinciding with the 50th anniversary of the founding of the UAE.

EUROPEAN SPACE AGENCY[3]

The European Space agency and its Russian counterpart, Roscosmos, have joined forces on NASA's InSight Lander, planned for summer 2020. Using a European rover and a Russian surface platform, the project aims to study the planet's atmospheric gases for evidence of biological or geological activity.

CNSA[4]

Landing tests are currently under way for China's first independent mission to Mars in August 2020. It is one of four deep space exploration missions planned by China's National Space Administration (CNSA), with an asteroid probe expected in 2022 and a mission to the Jupiter system set for 2029.

SPACE X[5]

With high hopes for humanity's future on Mars, Elon Musk's space exploration company is developing a fully reusable space-launch system, set for its first cargo mission in 2022. A crewed mission is intended to follow in 2024, creating a base from which Musk hopes to develop a thriving city and, eventually, a self-sustaining civilisation.

1 https://www.nasa.gov/topics/moon-to-mars/overview

2,3,4,5 https://www.theguardian.com/technology/2018/dec/02/five-planned-missions-to-mars

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Don't forget that we've already got a permanently manned location in space: the **INTERNATIONAL SPACE STATION (ISS)**. With a clear night sky you can easily observe it as it orbits overhead the UK. However, you will need to know the exact dates and times when it will be observable. For this information, go to the NASA website:

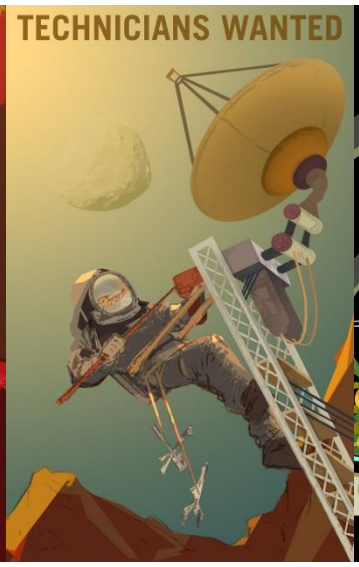
https://spotthestation.nasa.gov/

Have you started to think about what career you would like to have when you leave school or university? Or maybe you are reading this and you already have a career – perhaps you fancy a change.

When we do go to Mars, we are going to need all sorts of people with good education and a whole load of different skills.

Perhaps you could help?

Could you do any of the following....



You could teach things that are really out of this world!
You could use your skills to build our future on Mars.
All the equipment would need highly skilled technicians to keep it in service.
You could test your farming skills to grow all the food needed in the Martian soil.
You could mine the mineral resources on Mars' small moon, Phobos.
Above all, you could explore!

MANNED MISSIONS TO MARS

Maximilian Ledgerton 8SOA (Industria)

WHO IS TRYING TO GET TO MARS?

At one point there were a number of groups with the aim to get people to Mars; however, it seems that most failed and went bankrupt. I found it quite difficult to find very up to date information on some and had to rely on old reports.

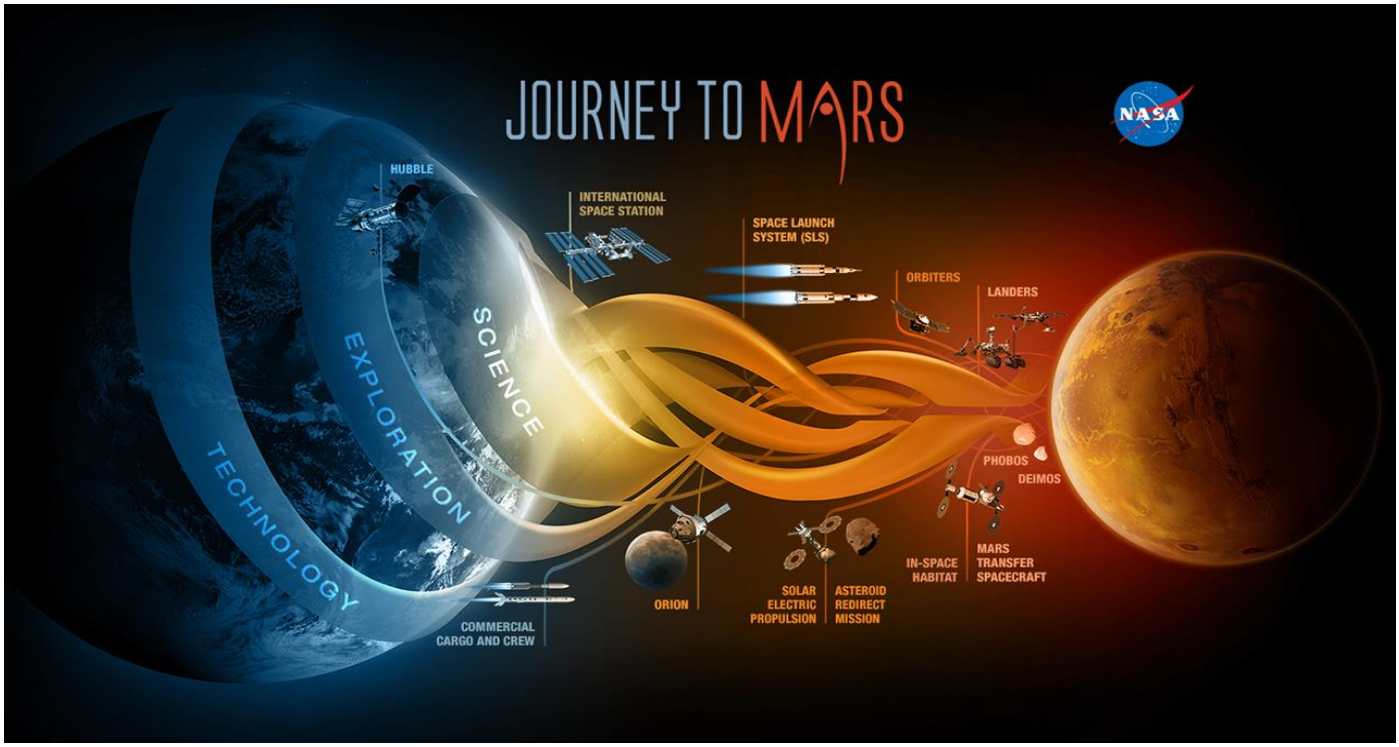
NASA

Getting astronauts to Mars is the main long-term goal of NASA's human spaceflight program. The agency is currently working to send humans to a near-Earth asteroid by 2025, and then to the vicinity of the Red Planet by the 2030s, as instructed by the then President, Barack Obama, in 2010. The current President seems to also support the project. NASA has estimated that the total cost of missions to Mars will be hundreds of billions of dollars.

Depending on launch timing, it could take as long as three years to reach Mars from Earth and return, and NASA has to adjust its rockets and spacecraft for such a long mission. The agency plans to send a crewed mission into deep space in the 2020s as a 'readiness' gauge – a test of whether it has technology for a long-term space habitat, protected against the effects of radiation and microgravity, which over time weakens bones, muscles and eyesight. Lockheed Martin, NASA's partner for the project, is working towards a 'main base camp' spacecraft for 2028.

The agency is currently building the most powerful rocket it has ever designed, called the Space Launch System (SLS), and are planning a test flight in 2019.

NASA has landed increasingly sophisticated robots on Mars over the last 15 years, with the most recent being the 1-ton Curiosity rover, whose observations indicate that Mars could have supported microbial life billions of years ago. Unfortunately, the robot sent its final picture in March 2019.



ELON MUSK'S MARS COLONY

Billionaire entrepreneur Elon Musk, founder of the private spaceflight firm SpaceX and CEO of electric car company TESLA, said that he established SpaceX in 2002 primarily to help humans become a multiplanet species.

Musk envisions launching colonists to the Red Planet aboard a huge, reusable rocket powered by liquid oxygen and methane, for about $500,000 per seat. The Mars colony would begin with a small group of pioneers but would eventually grow into a self-sustaining settlement perhaps 80,000 strong, he said.

FAILED ATTEMPTS

INSPIRATION MARS

Inspiration Mars Foundation is an American non-profit organisation founded by Dennis Tito that in 2013 proposed to launch a crewed mission to flyby Mars in January 2018, or 2021 if they missed the first synodic opportunity in 2018. Their website became defunct by late 2015 but it is archived by the Internet archive. The Foundation's future plans are unclear.

Dennis Tito became the world's first space tourist when he visited the International Space Station in 2001.

MARS ONE

Mars one was a small, private Dutch organisation that received money from investors by claiming it would use it to land the first humans on Mars and leave them there to establish a permanent human colony. From its announcement in 2012 to its bankruptcy in 2019, it is estimated to have received tens of millions of dollars. The organisation was not an aerospace company and did not manufacture hardware.

MARS DIRECT

Their plan, first developed in the 1990s by Mars Society head Robert Zubrin, urges a live-off-the-land approach in order to keep the costs of a Red Planet colonisation effort reasonable. But the estimated project's cost determined that long-term expenditure would total approximately 450 billion dollars spread over 20-30 years. Congressional reaction in the US was negative, given that it would have required the largest single government expenditure since World War II and within a short time all funding requests had been denied.

From the two organisations that still seem to be in the running to get a manned mission to Mars, I think NASA has the best chance, resources and support to get there.

HOW ARE NASA PLANNING TO GET TO MARS?

A workshop group of more than 60 individuals representing more than 30 government, industry, academic and other organisations has found that a NASA-led manned mission to Mars is feasible if the space agency's budget is adequate. Putting the first humans on Mars would also require international cooperation and private industry support.

According to Chris Carberry, the executive director of Explore Mars Inc., the organisation that hosted the workshop with the American Astronautical Society, *"To be able to make it feasible and affordable, you need a sustainable budget"*, he said in an article for SPACE.COM. *"You need a budget that is consistent, that you can predict from year to year and that doesn't get cancelled in the next administration. That said, major disruptive technology gains could always occur that could make it viable – we just can't count on that happening."*

Attendees associated with NASA, Boeing, Orbital Sciences Corp., and many others at the Affording Mars Workshop arrived at six agreements that could frame the way that space agencies work toward a manned mission to Mars. They are:

- The goal of sending humans to Mars is affordable with the right partnerships (international, commercial/industrial, intergovernmental, etc), commitment to efficiency, constancy of purpose and policy/budget consistency.
- Human exploration of Mars is technologically feasible by the 2030s.
- Mars should be the priority for human spaceflight over the next two to three decades.
- Between now and 2030, investments and activities in the human exploration of space must be prioritised in a manner that advances the objective of initial human missions to Mars beginning in the 2030s.
- Utilising the International Space Station, including international partnerships, is essential for human missions to deep space.
- Continuation of robotic precursor missions to Mars throughout the 2020s is essential for the success of human missions to Mars.

GETTING TO MARS

As a model of international collaboration and a huge undertaking in space, the International Space Station (ISS) could provide vital lessons about getting humans to Mars. *"The only reason the ISS has survived the years is because it's an international mission,"* Carberry said. *"It is held together by international treaties and strong agreements…if we were to follow that model and maybe even move on with the partnership to the next step, that perhaps could be the greatest legacy of ISS because that's a proven model of sustainability, because you have more holding it together than just an annual cycle."*

The $100 billion orbiting outpost could also be used to mimic parts of a mission to Mars. Engineers could use the orbiting laboratory to demonstrate and test telerobotics and new spacesuits, and to work out possible problems that could arise on a trip to Mars.

BRIDGE MISSION

The workshop group also explored the idea of a mission that would bridge the space station and a manned mission to Mars. The Bridge Mission could be anything from NASA's plan to capture an asteroid and bring it into lunar orbit where astronauts could explore it, to a small temporary station where astronauts could learn more.

It all seems a long way to go but hopefully, with the collaboration of many and the right funding, I will get to experience the first manned mission to Mars in my lifetime.

The following two papers are in poster form and deal with the topic of sound and sound pollution.
This got the Editor thinking about **where is the quietest place on Earth?**

Could it be in the middle of a vast desert, miles from anywhere? Or perhaps deep under the ocean?
The answer is no – the quietest place on Earth is actually **Building 87** in the city of **Redmond**, Washington, US. Described as "where sound goes to die", this Microsoft research lab is officially the quietest place on Earth, according to Guinness World Records.

It is so quiet that, when closed in the room, the only sounds you can hear are the sounds within your own body!

NOISE POLLUTION

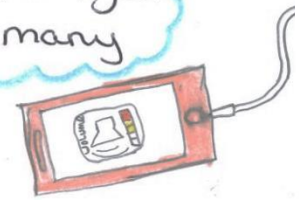
Rose Ashen 7TAY (Caritas)

Rose · Ashen

Noise Pollution

Loudness of Sound is measured in decibals (Db). This is a measure of intensity, wich shows how much energy the pressure wave has. Decibals are a relative measurement. They show the intensity of a pressure wave to a normal or standard pressure.

There are many Sounds that are able to damage your hearing, for example having ear plugs in with the volume on full. This will effect your hearing because the music comes directly to your ear, the Sound has nowhere to go and can only travel down your ear. It then makes it's way to the ear drum wich can damage it by the pressure of the Sound.
There are many other object's that can cause damage to your ears, for example working with loud machinery (factorys), Demolition ~~hamer~~ hammer and many other things.



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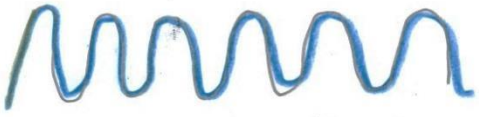
How Sound travels

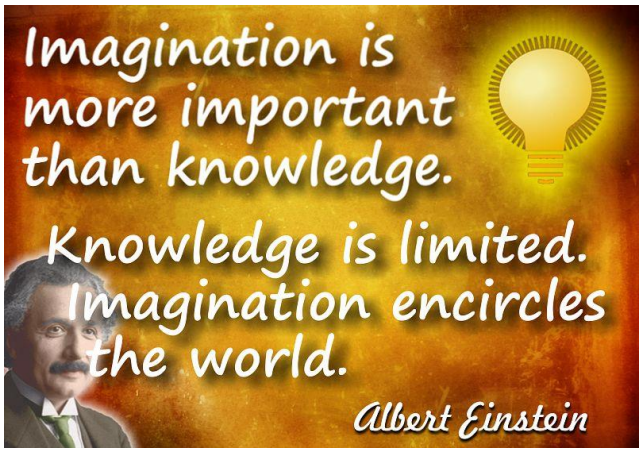


However, there are ways to to prevent hearing damage. for example you can wear ear defendors when in a factory or at a building site, you can also Keep the Volume below the red bar on earplugs.

SOUND – a warning!

Bea Price 7TAY (Caritas)

EDITOR'S NOTE: Science Journals do not normally publish narrative pieces, poetry or musical lyrics; however, the Editor is making an exception in the following three pieces of work: one a hip-hop/rap lyric; one a poem; and one a personal story by two students of their lives as a fictitious flowering plant called a *PELENDRONEIA plant*.



In order to render science as interesting as possible, especially in the formative years of the young students, the Editor welcomes pieces of work that require the author to use their imagination, but at the same time maintaining a basis in scientific fact.

One as great as Albert Einstein treated imagination with a particular reverence.

MY PLANT RAP

Tilly-Ann Crotty 7NOX (Industria)

I am a plant and this is ma story
You gotta stand back and take inventory
It all started off with germination
Get ready to take this equation
I need more water, sun and soil to grow
Before u see what's goin' on below
As my roots grow down below
My stem starts to show

Next up fresh outta da soil
My leaves start to uncoil
Facin' the sun is the way they go yu'know
To get that light in order to grow
Yo now ma flower is startin' to blossom
Ma honies tell me it's awesome

Last but not least it's pollination
This keeps up the flower population
Pollen goes from the stigma to the stamen
In order for a flower to grow

Peace.

POEM OF A SCIENTIFIC PLANT

Kieran Fernandes 7CPR (Industria)

As pollination occurs,
A pollen grain dispers,
Then it goes to the female stigma, As I waited for the wind to come by,
Seed dispersal occurred and I could fly.
As I landed on the ground, germination was around.
As I grew tall,
As big as a ball, The sun shone upon me.
Then I sensed a bee,
The pollination started again,
My pollen stuck onto the bee,
Mostly because of me.
Then it began to rain.
It was raining too much and I could feel some pain.
Then a rabbit came by
And I had to say goodbye.

EDITOR'S NOTE: the following two papers, by Ava Denyer-Peach and Hannah Wilkinson, are a collaborative effort. The two authors present their individual stories as twin plants, both very personal and moving.

(And they say that plants do not have emotions!)

They then jointly describe, in more formal terms, the nature of their very rare and special plant.....

MY LITERAL LIFE

Ava Denyer-Peach 7TAY (Patientia)

In my lifetime I was a rare mutation of *Pellen* and *Droneia*. I started life as a tiny seed in my mother's ovary, the next thing you know I was fertilised by my dad the *Droneia* plant. I had been pollinated by an insect.

Three months later I exploded out of my mother for seed dispersal, I think it was because of my twin and she couldn't cope with both of us. I know two kids doesn't sound like a lot but we are really rare. I think mum could have coped with me but my twin, Hannah, made mum's world hell. The *Pellen* plant normally has only one seed in its shell, but in our case there were two.

After being dispersed I then grew for two and a half months with not a worry in sight; but when I reached above the surface I saw my wretched twin, Hannah, lurking. I thought I had been free, but not anymore.

As we got bigger the race for the sunlight and water got harder and, because Hannah is bigger than me, she always seemed to get more than me. Her roots are deeper than mine and her petals are larger than mine.

After a year of racing against Hannah for the largest flower head, I won. We finally saw each other's true colours:

Me = a beautiful pastel yellow with hints of deep purple

My ugly sister = a horrifying hot pink with hints of useless dark orange

So where am I now, you ask? Well, that is the problem. These weird, massive things walked up to me and Han and stated shouting *"We've found it, we've found two types of Pellendroneians!"* Then they got a big, sharp, metal thing and squashed all the earth around us. Then they locked us in these big, dark boxes, After that, they moved us somewhere, I don't know where...I felt ill...I felt sick…… .I wanted Hannah.

Please read on for Hannah's version of our life……

MY AMAZING LIFE AS A PINK PELLENDRONEIA (kind of)

Hannah Wilkinson 7CKD (Humanitas)

Ugghhh, the worst day of my life was when 'HER THE BEAST' (a.k.a Ava, my twin) exploded out of our mum at the same time as me. At first it was great because I had brighter colours, so more insects landed on me. I also had a deeper root and larger petals so, hahaha Ava, I won the battle for sunlight.

Wait, let me backtrack…I started off stuck in my mum's ovary for 3 months. Luckily, I didn't have to see the beast for 3 whole months, then, when I don't think our mum could handle us any longer (by us, I mean Ava, as I was a perfect seed/child, of course) she split open and we busted out.

When our petals had finally fully formed, we found out our colours…mine were a beautiful raspberry pink with an amazing bright, burnt orange. Ava's were purple and disgusting, with a useless yellow.

Just like that we are back to this part in the amazing story of my life. Well, it was then…but it's not any more.

After hearing that you are probably wondering where I am right now, well you see I lied about the fact that seeing Ava when we exploded out of mum being the worst…because this day was the worst, actually.

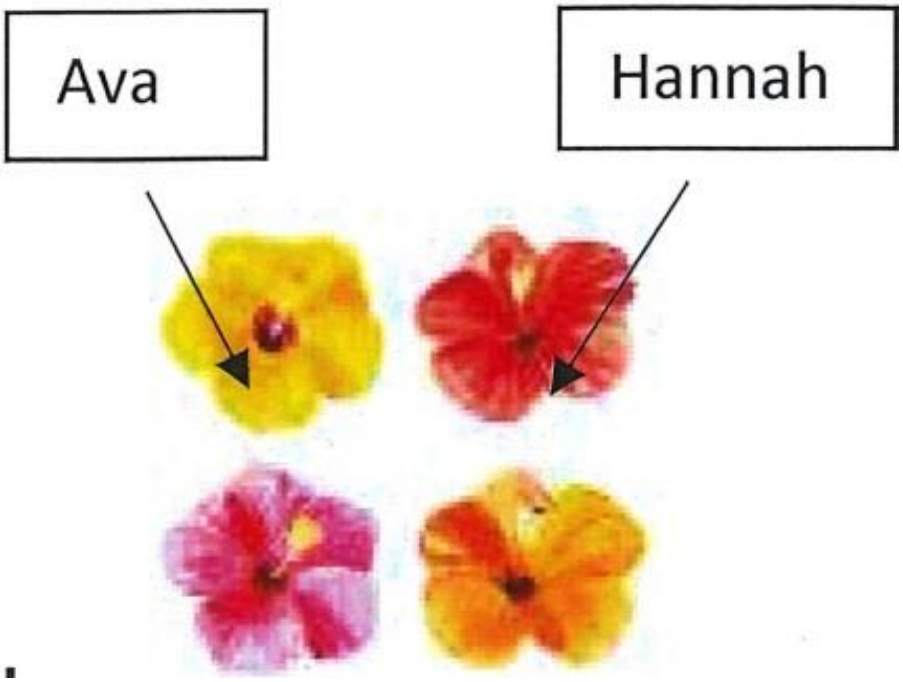
The day started off fine as Ava and Y were having a long conversation but then. All of a sudden, these big, weird black figures walked up to me and Ava shouting *"We've found it, we've found two types of Pellendroneians!"* Then they got a big, metal sharp thing and squashed the earth around us. Then they locked us in these big, dark cages (Ava thinks they were boxes). After that they moved us somewhere, I don't know where…I felt lost…I felt nervous…I just wanted Ava……

THE PELLENDRONEIAN PLANT

This is a rare species of plant, which is a mixture of Pellen's plant (female) and the Droneian plant (male). This plant can only reproduce with a separate male and female plant. It is pollinated by insects. The Pellendroneia mutation contains both male and female gametes.

The Pellen's plant	The Droneian plant
The female plant is predominantly a raspberry pink or a golden yellow. This plant is called an 'imperfect plant' as it only has female gametes.	The male plant is predominantly a bright purple or a burnt orange. This plant is called an 'imperfect plant' as it only has male gametes.

The Pellendroneia petals are above the ground, yet the style and other female parts as well as the stem are below the ground. After being fertilised, the seed is then kept in the ovary for 3 months before going through explosive seed dispersal. In the plant's stem there are 3 new buds meaning, each time the plant goes through seed dispersal, it will grow through the other petals, then carry on growing until it is a fully formed Pellendroneia and the other petals wilt.



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When it comes to weird and wonderful plants, the most remarkable (and deadly!) are

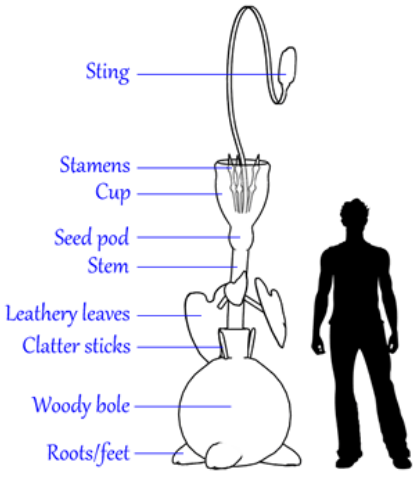
TRIFFIDS.

The triffid is a tall, prolific and highly venomous plant species that is capable of locomotion using its three, leg-like protrusions. Triffids are also carnivorous!

Triffids have a straight stem, springing from a woody bole which is shaggy with little rootlet hairs. This bole is roughly spherical with three bluntly-tapered projections extending from the lower part. These can dig into the soil to function as temporary roots or can be moved in such a way as to give the plant the ability to actually walk.

At the top of the stem is a funnel-like formation which has a tightly-wrapped green whorl within resembling a rolled fern frond. This whorl is sticky and can lash out at passing animals. It carries a sting which can kill a full-grown man; the poison is carried in sacs at the base of the sting.

Triffids have three small, bare sticks which grow straight up beside the stem. These "clatter sticks" create a rapping noise which is considered to be some form of communication. It is clear from experiments that they can hear or, at least, sense vibrations in the air. There are also short sprays of leathery green leaves.



At the age of one year, they reach a height of approximately half their full growth which averages a little over 2 meters/7 feet in Europe, reaching a maximum of about 2.4 meters/8 feet. In the tropics, they grow taller and quicker with a maximum height of 3 meters/10 feet.

Triffids propagate by expanding the dark green seed pod until it bursts, sending millions of white seeds into the air which float for many kilometres. The usual season for this in Europe is late August.

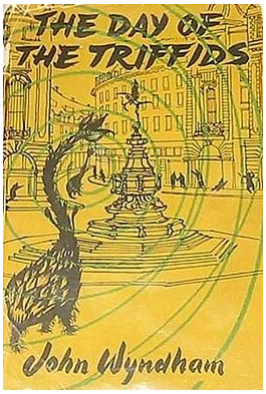
Triffids are primarily carnivorous, digesting any insects that become caught in the sticky area within the cups. But they are also capable of assimilating larger animals by killing them with their stings and absorbing them as they decompose with the sting, tearing off pieces of flesh and dropping them into the cup like an elephant's trunk.

THEY HAVE ALSO BEEN KNOWN TO ATTACK AND DEVOUR HUMANS!

EDITOR'S NOTE: if the above description of the Triffid plant sounds a bit too fantastic to be true, well ..... it isn't true!

Triffids are the fictitious creation of the author JOHN WYNDHAM and featured as the deadly antagonists in his famous 1951 novel *THE DAY OF THE TRIFFIDS*.

So please don't have nightmares!



Now that we have passed the SPRING EQUINOX we can look forward to longer and, hopefully, warmer days ahead.

Jack Frost might still be lurking to make an occasional appearance but, with the May Beltane fast approaching, another Jack will come to the fore: *Jack 'o the Green*. Also known as *Jack in the Green*, he heralds the true re-birth of the year and signals the start of the new growth cycle.

NEXT ISSUE: JULY