



Journeys in the Spirit

inward outward upward downward

Children's work edition December 2011 Issue 58



Three Quaker scientists – flowers, crystals and space

Getting ready

This issue looks at the work of three Quaker scientists – Priscilla Wakefield, Kathleen Lonsdale and Jocelyn Burnell. Priscilla wrote books for children and young people and was also a botanist. Kathleen was an expert in crystallography. Jocelyn is an astronomer renowned for her part in the discovery of pulsars.

As Quakers we are used to talking about 'that of God in everyone'. This issue suggests some ways that children can, just like the scientists, look for that of God in nature, in the universe. In her book, *'Introduction to Botany, in a series of familiar letters'* published in 1798, Priscilla wrote:

"The design of the following 'Introduction to Botany' is to cultivate a taste in young persons for the study of nature which is the most familiar means of introducing suitable ideas of the attributes of the Divine Being by exemplifying them in the order and harmony of the visible creation"

When looking at some of the pictures of what the scientists found out or looked at and then using questions like - What can you see? What do you notice? Do you have any questions about what you noticed? What does it look like? What does it make you think or imagine? – you can encourage closer looking, thinking and wondering.

This issue also gives opportunities to say, 'Wow! Quakers have done some amazing things – we can be proud of that.'

Journeys in the Spirit offers resources and ideas to Quakers engaging with children and young people.

This children's work edition comes out monthly. It offers resources and ideas to Quakers engaging with 5–12 year olds in a Quaker setting.

It provides opportunities for exploring, creating and learning in an atmosphere of worship in partnership on our shared journey in the spirit.

Gather

Make the children's meeting room as dark or dim as you can. Have a selection of candles spread out on a dark cloth. Remember matches. Have a vase of flowers, small branches and leaves ready to bring into the circle.

Welcome children and other helpers as they arrive. Ask everybody to get comfortable on the floor. After a moment or two light the candles. Ask everybody to gaze at them. After a couple of minutes place the vase of flowers somewhere on the cloth. After a further couple of minutes say thank you to bring people back to paying attention in the group. Extinguish the candles. Let more light back in.

Ask questions like:

- What did you see?
- Was there anything else that you noticed?
- Do you have any questions about what you saw?
- What did looking at the candles feel like?



Underpinning references

'To see a world in a grain of sand,

And a heaven in a wild flower,

Hold infinity in the palm of your hand,

And eternity in an hour.

A robin redbreast in a cage

Puts all heaven in a rage.'

William Blake

Engage

Three Quaker scientists.

Begin by asking a question like, 'what is a scientist?', 'what do scientists do?' Talk about this if necessary or move on to focus one of the scientists from below.

Priscilla Wakefield. Say that Priscilla was alive more than 200 years ago. Show the pictures of her that are on *Additional Resource 58.A*. Say that she wrote books for children. One book was about botany – the study of flowers and plants. It was called '*Introduction to Botany, in a series of familiar letters*'. It was made in 1798. It is in the Quaker Library in Friends House. It is smaller than a paperback book and just fits in a grown up hand. It is beautiful. (See sidebar for details of how to arrange a visit to the Library to see this and other books). Priscilla wanted children to know lots and lots about plants. Put out copies of the pictures of Priscilla's drawings that are on *Additional Resource 58.B*. The third picture shows a later copy of the book with coloured pages. Have enough for everyone. Ask children what they like or don't like about the pictures. After time for people to speak who want to move on. If your Meeting House has a garden take everybody outside – each with a plastic or paper bag. Ask everybody to collect 2 or 3 things that they like, that catch their eye or they find interesting. Go back inside. If you don't have a garden you can either ask children at an earlier Meeting to bring some things in or you can bring a selection of flowers, plants, branches, leaves, seeds and cones yourself. Move to a Priscilla Wakefield Respond activity.

Kathleen Lonsdale. Kathleen was a scientist. Show the pictures of her on *Additional Resource 58. C*. She loved crystals. She was born 1903 in Ireland. She came to England in 1908. Ask a question like, 'Has anybody here or someone you know had an X-ray on part of their body?' or 'does anybody know what an X-ray machine is used for?' Have a brief chat about what it is – a special kind of light that we can't see but that can help doctors and scientists see inside things like bodies and rocks. Wow! How clever is that! Kathleen did this.

Pass around a bowl of rock salt crystals. Ask everybody to pick one up and hold it. Also pass round a larger piece of crystal – maybe quartz or a geode with crystal inside. If you haven't got any just ask people in Meeting. Also see sidebar for other suggestions. Ask everybody to feel the crystals and look at them.

Kathleen was famous for finding out what was inside all sorts of crystals and rocks – she used special X-rays to do this. Whilst everybody is feeling the different crystals say that people liked what she did so much that a special diamond was named after her – it was called *Lonsdaleite*. This is found in rocks that fly round space and sometimes crash on earth – the rocks are called meteorites. Ask everybody to put the crystal they are holding onto a tray in the middle of the group. Ask a question like, 'What do you think the inside of crystals is like?' After listening to any comments say something like, that scientists like Kathleen think the inside of crystals looks like this – lay down copies of the pictures of models of crystal on *Additional Resource 58.D*. Point out what the inside of *Lonsdaleite* might look like – it looks really strong; ready for flying through space! Ask what people think about the pictures. What do they look like? Next put down copies of *Additional Resource 58.E* with pictures of snow crystals and a real piece of *Lonsdaleite*. Say something about every snow crystal or flake being different. Let everybody look – ask what they see or notice, if anything, about the crystals. Move to a Kathleen Lonsdale Respond activity.

Jocelyn Burnell. Jocelyn was born in 1943. She is still works as a scientist. She is an astronomer. She finds out all about stars. Show the pictures of Jocelyn on *Additional Resource 58.F* but don't go into any conversation about them.

Say that there will be talk about what she did in a little while but first everybody is going to go on an imaginary journey into space. See *Additional Resource 58.G* for a description of what to say to take children on an imaginary space journey.

After the 'journey' ask the question, 'does anybody know what a telescope is?' If necessary say something about telescopes being used to see things a long way away. Jocelyn's telescope was different – it was used to listen - ..continued.....

References & other resources

Quaker Library.

To arrange a visit contact the library on: 020 7663 1035

When Kathleen heard that the diamond had been named after her she said,

"It makes me feel both proud and rather humble that it shall be called lonsdaleite.

Certainly the name seems appropriate since the mineral only occurs in very small quantities (perhaps rare would be too flattering) and is generally rather mixed up!"

Kathleen was quite small!

Crystals can often be bought from 'new age' style shops. There are also lots of online suppliers.



Additional Resources on this page are at: <http://www.quaker.org.uk/resources-children>

References & other resources

Jodrell Bank website

www.jodrellbank.manchester.ac.uk/research/pulsar/Education/Sounds/

On *Additional Resource 58.H* the last photo of the four is of a group of pulsars where sounds came from – it is called:

'47 Tucanae':



Three other websites with information about pulsars:

<http://outreach.atnf.csiro.au/education/everyone/pulsars/>

<http://tinyurl.com/6x5yfjh>

www.bbc.co.uk/news/science-environment-15572628

Additional Resources on this page are at: www.quaker.org.uk/resources-children

..continued:

to sounds from a long way away, from space. Her telescopes didn't have glass in them they were made of wire and metal. One time she was listening and she, and people she worked with, heard a strange sound. It was a sound they had never heard before. For a little bit they thought it might be a message from other creatures or beings living on another planet and they called the sound L.G.M – this stands for 'Little Green Men'. Jocelyn and people she worked with then realised something almost as exciting. The sound was coming from something they started to call a pulsar – this stands for 'pulsating star'. This is a big idea. Try to explain it like this:

'Stars are suns. After a long, long, long time they run out of the stuff that keeps them hot and shining – they sort of get empty in the middle. Then they collapse or fold up and sometimes they explode in a huge bang. There is stuff left that is very, very heavy. It also makes a sound that goes all the way through space – the sound can be a bleeping or a ticking or a whoo-whooh sort of sound. These are the sounds that Jocelyn heard. She was the first person ever to hear these'.

See the sidebar on this page for details of a Jodrell Bank website where you can listen to sounds from pulsars. On *Additional Resource 58.H* there are pictures of pulsars. Show these to the children. The first of the four is an artist's picture of what might a star might look like after it has exploded and become a pulsar – it is surrounded by broken bits of star. There is also a picture of the Fermi space telescope that takes pictures out in space. Move onto a Jocelyn Burnell Respond activity.

Respond

Priscilla Wakefield.

You will need good quality drawing paper – like cartridge paper – and a good selection of drawing and colouring equipment. Have some soft music to play. If children have collected things from the garden these can be used in this activity. Otherwise, around the room, have ready a selection of flowers, leaves, twigs and branches, fruit, pods and seeds. Have different kinds of display – from very simple with just one or two things to more complicated and varied arrangements. Also lay out copies of the drawings by Priscilla. See *Additional Resource 58.B*. Quietly, with music playing, children can then make drawings or copies of the displays, their objects or of Priscilla's pictures.

Kathleen Lonsdale.

Making crystals. Children can grow crystals. Here are instructions for making salt crystals. They can take several days to grow so it might be an idea for children to start some in Children's Meeting and also to take instructions home to make some there as well.

Salt crystals. You will need: *Salt. Warm water. Jars. Pencils. Pieces of string* Fill a jar half full with warm water. Stir salt into the water until no more salt will dissolve. Attach a thread or string to a pencil and hang it above the solution. Do not let the thread touch the bottom of the jar.

Have sets of *Octons* and *Sticklebricks* for children to make their own crystal shapes - available from toyshops and online at www.amazon.co.uk



Octons



Stickle bricks

Jocelyn Burnell. You will need: *black or dark blue drawing paper; drawing and colouring things – paints; brushes; oil pastels; coloured chalks; copies of the pulsar pictures on Additional Resource 58.H and any other star books and pictures you can find.* Lay these out alongside the drawing materials. Play soft, quiet music. Say that children can make pictures or patterns of stars or pulsars or maybe of what they saw on their imaginary space journey.

Reflect

Gather back together on the floor or around a table.

On the floor or table place a variety of the pictures about whichever scientist or scientists Children's Meeting has focussed on. Children can, if they wish, also bring and place their pictures, crystal jars, crystal models and the big crystals touched earlier.

Say that we can all feel really, really happy and proud about the special things that the Quaker scientists found out and did.

You could also say that all around each of us – everywhere we look, and even when we are not looking, there are beautiful and interesting things. Some are huge like the sky; some are very, very small like shells or even a drop of water or a grain of sand.

Ask everybody to join together in worship. In the stillness and quiet children can look at the pictures and crystals; they can think about something beautiful they like to look at or just feel very good and smile about what some Quakers found out and told everybody about.



Review

Reviewing can happen at the time or later, and may be particularly helpful where a series of activities is planned around the same themes. Some useful questions to consider are:

- What went well, and why?
- What didn't go so well, and why?
- How well did the children understand the ideas that the scientists were exploring?
- What might you do differently another time?

This issue was written by Chris Nickolay and edited by Howard Nurden. The Topical activity was written by Chris Nickolay.

The next children's issue of *Journeys in the Spirit* is also the start of Series 7 will begin in January 2012. The theme is going to be, '**Some Bible stories**'. There will be seven issues. The first, **Issue 59** is an introduction to the theme and will include some history and thoughts and activities about how to talk about and explore these things with children. This will be available on January 4th 2012.

Issue 60 is about a range of ways to look at and explore the Creation story. This will be available on February 1st 2012.

Issue 61 explores the story of David and Goliath – how the smallest can challenge what appears to be very powerful. This will be available on March 1st 2012.

Materials available online are:

Current issue additional Resources Sheets

An easy to use plan for a Children's Meeting

A simple plan for an all age Meeting for Worship

A topical activity about planting trees

Also a 'How to use *Journeys in the Spirit*' guide; a link to special issues; an archive of previous issues; a discussion forum and a link to the *Journeys in the Spirit* Youth edition.

All these are available at: <http://www.quaker.org.uk/journeyschildren>

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Journeys in the Spirit

Children's work

Additional Resource 58.A



Engage

Pictures of Priscilla Wakefield



Priscilla with her husband and sister



Journeys in the Spirit

Children's work

Additional Resource 58.B

Engage Pictures by Priscilla Wakefield from 1798

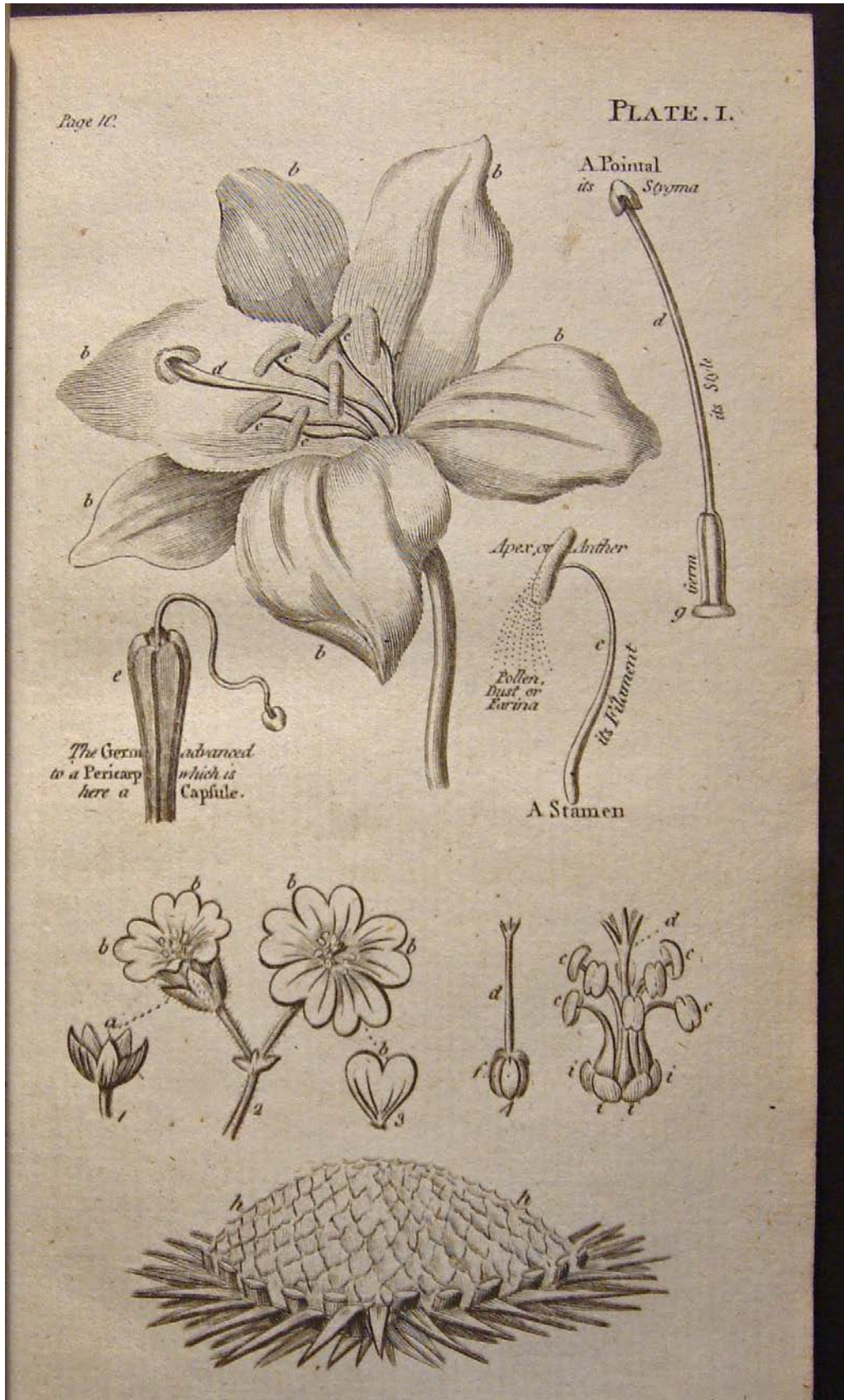
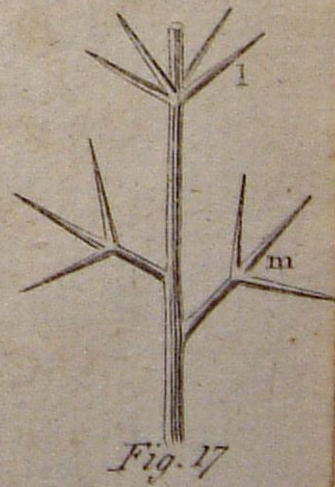
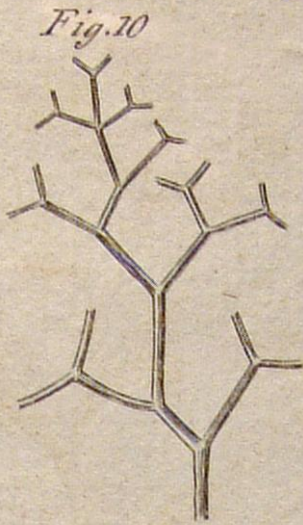
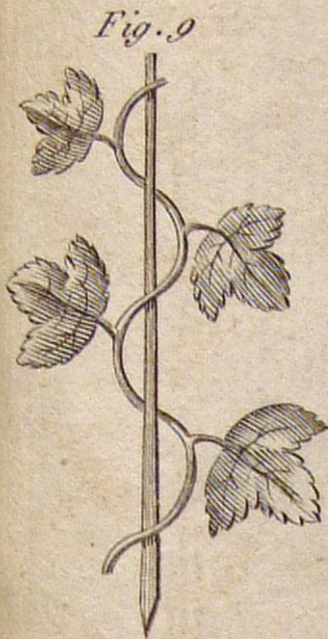


PLATE XI.



PROTISTISBICE



INTRODUCTION TO BOTANY.

ILLUSTRATIVE ENGRAVINGS.

PRISCILLA WAKEFIELD.

THE TWELFTH EDITION.

WITH CORRECTIBLE IMPROVEMENTS.

AS SPECIALLY CONSULTED & UNDER SUPERVISION BY HER
MAGNIFICENT MAJESTY THE QUEEN IN PARLIAMENT ASSEMBLED,
BY ORDER OF HER MAJESTY'S COMMISSIONERS OF THE
SCHOOLS OF ARTS AND MANUFACTURES.

LONDON:

HENRY D. JOHN, YORK STREET, COVENT GARDEN,
SUCCESSORS.



Journeys in the Spirit

Children's work

Additional Resource 58.C

Engage

Pictures of Kathleen Lonsdale





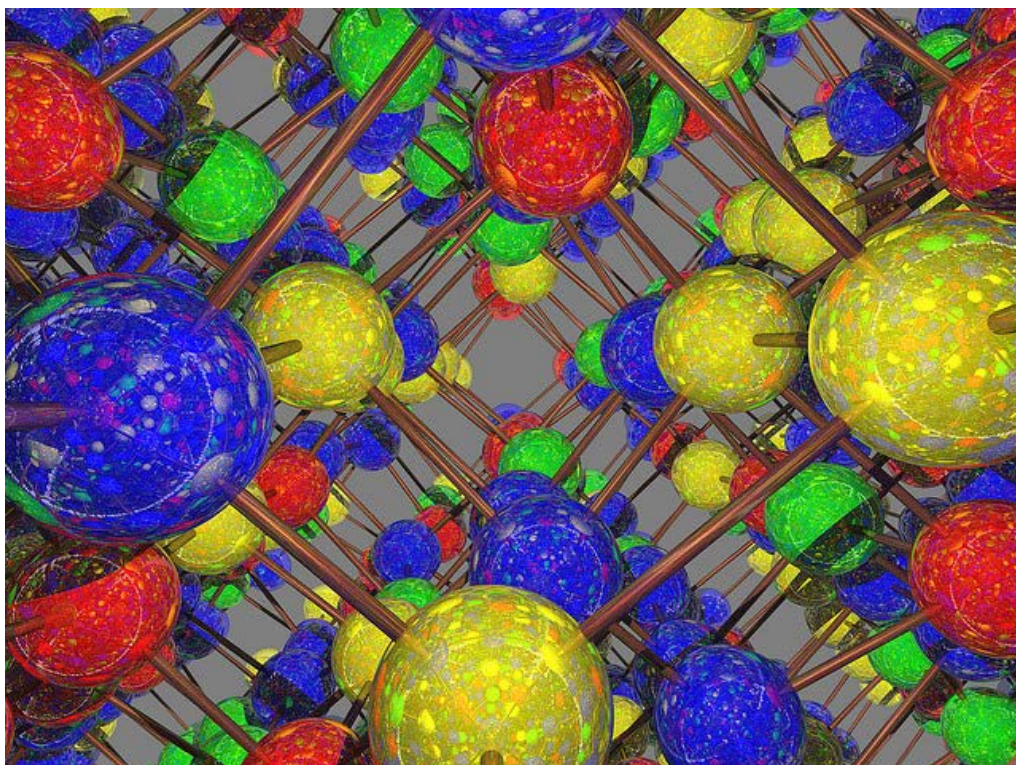
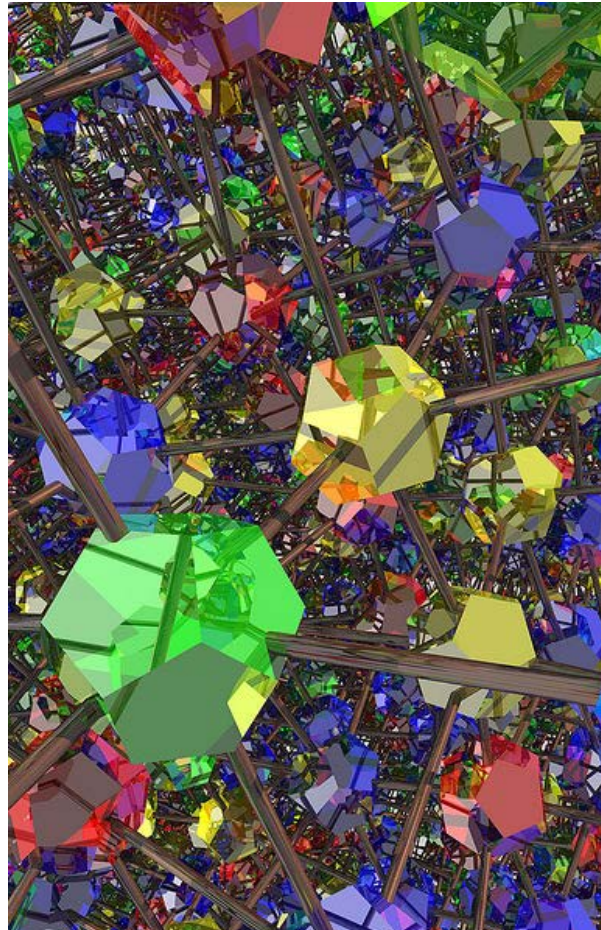
Journeys in the Spirit

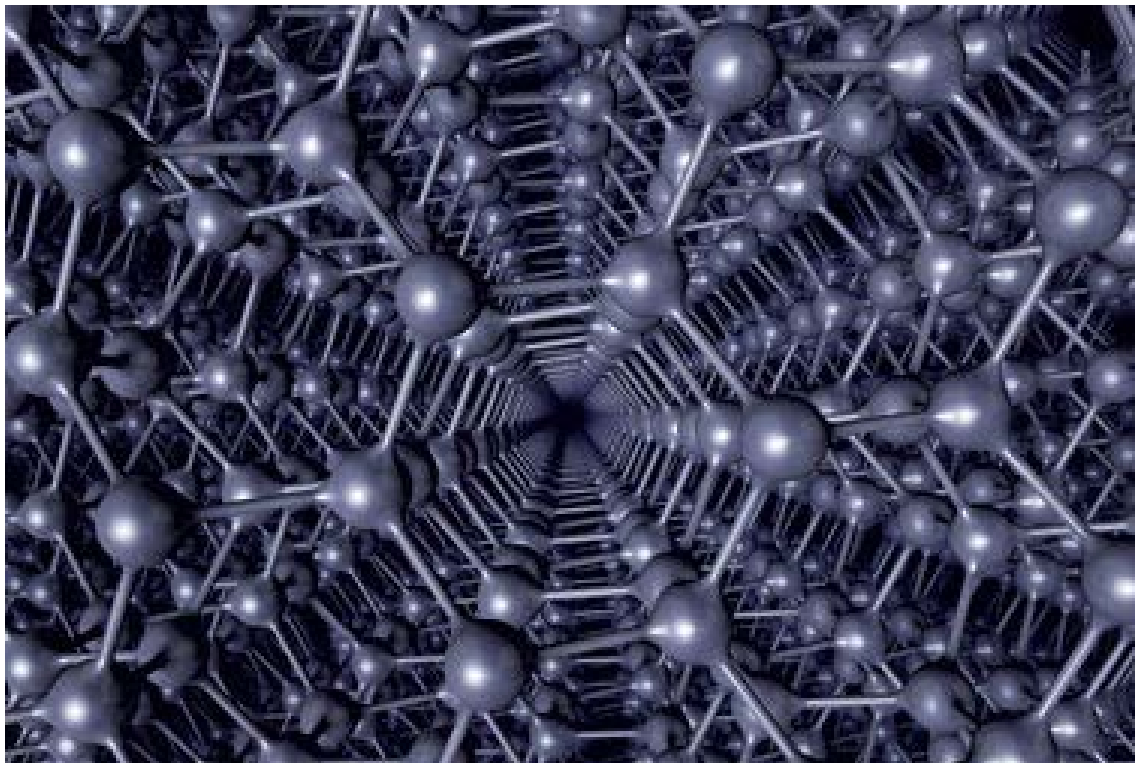
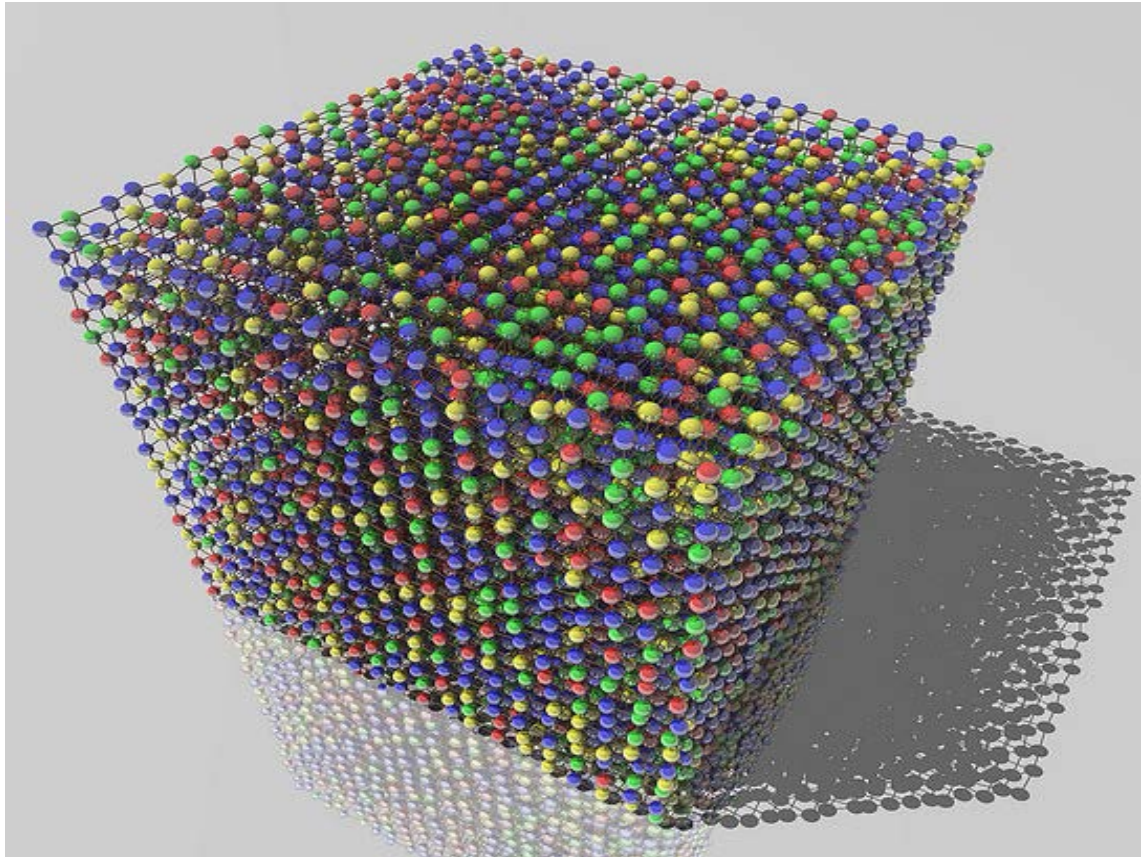
Children's work

Additional Resource 58.D

Engage

Inside crystals





A model of Lonsdaleite



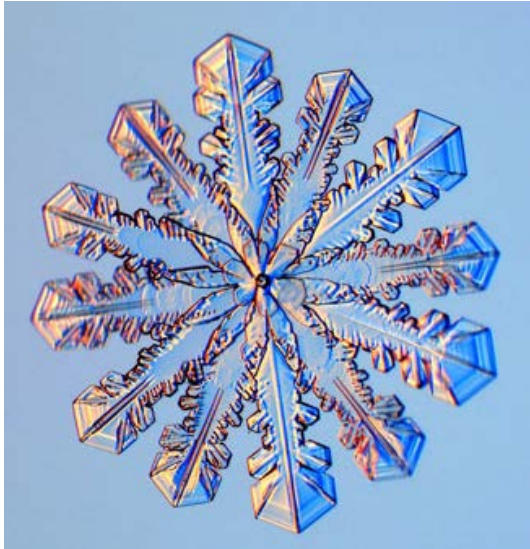
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Children's work

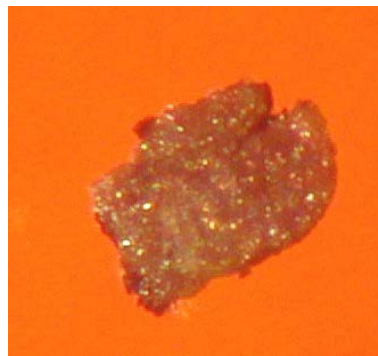
Additional Resource 58.E

Engage

Snowflake crystals and Lonsdaleite



Snow crystal pictures guardian 2009



Lonsdaleite crystals





Journeys in the Spirit

Children's work

Additional Resource 58.F

Engage

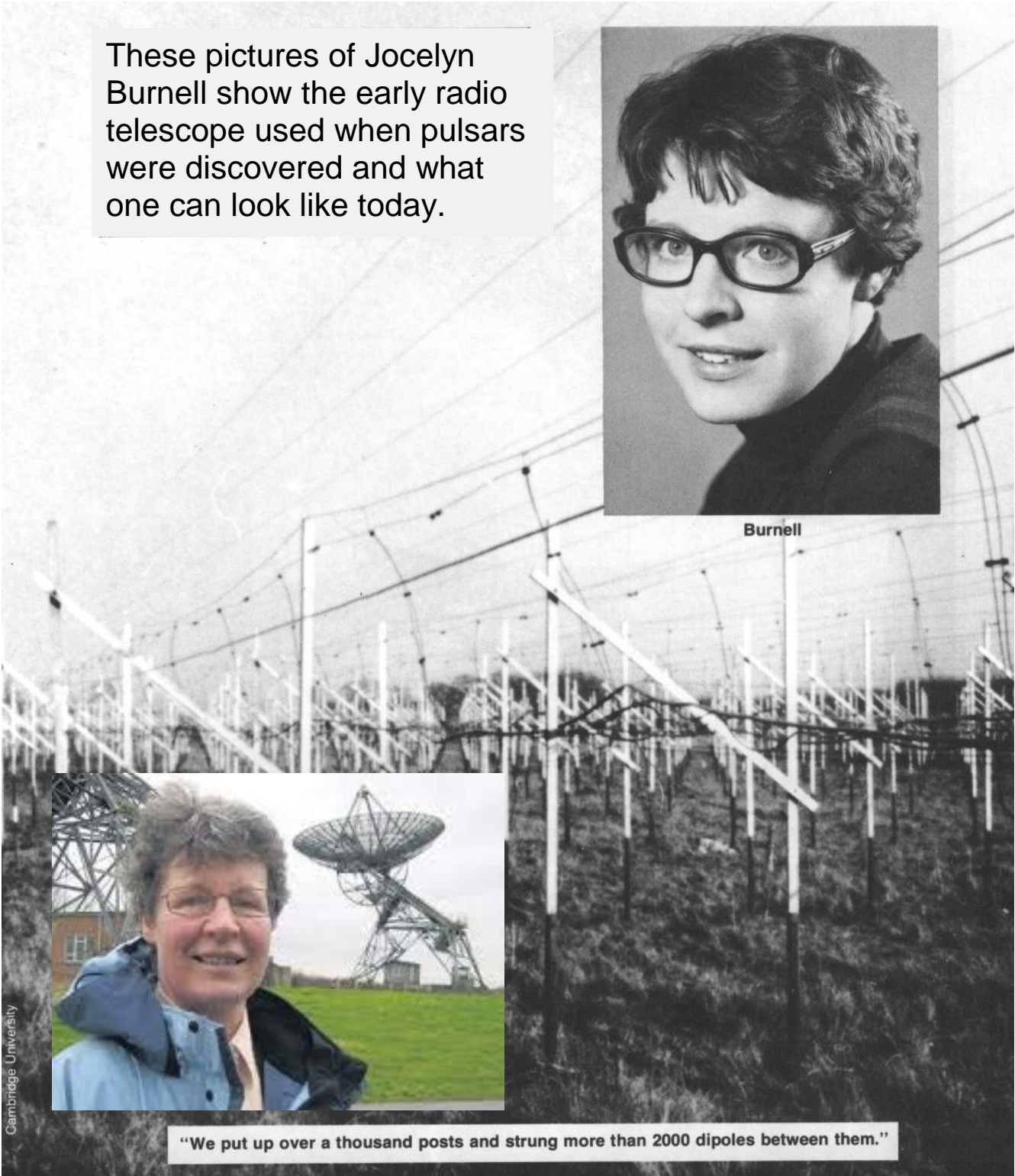
Pictures of Jocelyn Burnell



These pictures of Jocelyn Burnell show the early radio telescope used when pulsars were discovered and what one can look like today.



Burnell



"We put up over a thousand posts and strung more than 2000 dipoles between them."



Journeys in the Spirit

Children's work

Additional Resource 58.G

Engage

An imaginary journey into space



This is a guided visualisation but I wouldn't call it that to children. It is simply a 'journey into space and back again'.

This is what you say:

'Everybody find a space to lie down where you are not touching anybody else. Get comfortable – breathe slowly in and out a few times. Close your eyes. Relax.

Imagine that you are in your bedroom, safe. It is night time.

You discover that you have a secret power – you can float off the ground up into the air and you can control where you go.

Slowly you float off your bed and out of the window. Nobody sees you. When you are just outside your window you look down and you see a very thin but strong thread joining you to your house.

You float higher. Your house looks small.

You float even higher. You look down and you can see your town (village, city...) all lit by lights below you.

You go higher. It's a bit cold but you feel quite safe and you remembered your coat.

Now, when you look down, you can see a big shape below with bits that sparkle with light and bits that are dark. That's the country where you live.

You float even higher – you are quite safe – your thread is still going all the way down to your home.

Now when you look down you see the most beautiful thing. It is our Earth. Round. Shining. Blue and green and white and brown. It's lovely.

You float slowly higher. Now you are far out in space. When you look down again you see the Earth but, also, on the other side of the Earth, you see a silver shining ball covered in a bobbly pattern. It's the moon.

Now, for the last time you float further and further out from Earth. You are in space and Earth is almost invisible. Look all around you. There are stars everywhere, more than you can count. Some sparkle, some seem to have different colours. They are everywhere. Each one is a sun just like ours, shining. Just float and look.

Then you remember something. You are hungry and it must be nearly breakfast time at home. You begin to float back home. Away from the stars, you see the moon, you see Earth getting closer – blue, green, brown and white.

You can see the shape of the country where you live. Now the town (village, city...). Closer, slowly.

You can see your home. Your window. You float in and land softly on your bed. You fall asleep. Slowly you wake up because someone has called out, 'Breakfast is ready'.

Ask everybody to slowly open their eyes, sit up and look around the room. Have some drink and biscuits ready. After a moment ask if anybody has anything they would like to say about what they just did.

Now go back to page 2 of *Journeys in the Spirit* Children's work edition to continue with the Engage activity.



Journeys in the Spirit

Children's work

Additional Resource 58.H

Engage

Pictures of pulsars and a satellite

