

Y creigiau sydd i'w gweld yn Nyffryn Dyfrdwy Rocks you may see in the Dee Valley

Creigiau gwaddod

Yn wreiddiol, roedd y creigiau hyn yn haenau o dywod, llaid neu weddillion creaduriaid môr a gafodd eu claddu a'u cywasgu a'u troi'n dywodfaen, yn garreg laid neu'n galchfaen.

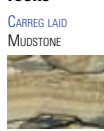
Sedimentary Rocks

These rocks were originally sand, mud or the remains of sea creatures that have been buried, compacted and formed sandstone, mudstone and limestone respectively.

Creigiau gwaddod

Sedimentary rocks

CARRIG LAID
MUDSTONE



TYWODFAEN
SANDSTONE



MEINI DYFOD
ERRATICS



Meini dyfod

Cafodd y meini hyn eu cludo gan iâ ac maent yn estron i'r mannau lle y gorweddant heddiw. Fe'u gwasgarwyd dros y tir wrth i'r iâ ddamer tua 17,000 o flynyddoedd yn ôl, ar ddiwedd yr Oes Iâ ddiwethaf. Maent yn ddefnyddiol gan eu bod yn dynodi cyfeiriad llif yr iâ.

Erratics

These rocks were transported by ice and are foreign to the places in which they are found today. They were dropped when the ice melted about 17,000 years ago at the end of the last Ice Age. Erratics are useful for indicating the direction of ice flow.

Creigiau metamorffig

Yn wreiddiol, creigiau gwaddod neu igneaidd oedd y rhain ond cawsant eu newid neu eu metamorfforeiddio gan wres a/neu wasgedd. Dros gyfnod o filiynau o flynyddoedd trodd llaid, a ddyddodwyd yn wreiddiol ar wely cefnfor dwfn, yn garreg laid ac yn a'n llechfaen dan ddylanwad cywasgiad dwys.

Creigiau metamorffig

Metamorphic rocks

LECH A SĒL BLWIM
SLATE WITH LEAD
FLASHING



Metamorphic Rocks

These rocks were originally sedimentary or igneous rocks that have been changed, or metamorphosed, by heat or pressure. Slate, originally laid down as mud in deep oceans, compacted over millions of years into mudstone was then compressed into slate.

Creigiau artiffisial o wneuthuriad dyn

Pan nad oedd cerrig parod neu addas ar gael, aeth pobl ati i gynhyrchu cerrig gwneud ar ffurf briciau neu goncrit. Defnyddiwyd clai Rhiwabon, ger Wrecsam, i gynhyrchu briciau coch adnabyddus Rhiwabon. Defnyddid clai Sir Amwythig i gynhyrchu'r briciau glas cadarn.

Craig artiffisial

o wneuthuriad dyn

Man-made artificial rock

BRICIAU COCH
RHWABON A BRICIAU
GLAS SIR AMWYTHIG
RUABON RED BRICK
AND BLUE
SHROPSHIRE BRICK



Man-made or Artificial Rocks

When natural rock is not suitable or available, humans made rock in the form of bricks or concrete. Here, Ruabon clay from near Wrexham, has been used to make typical Ruabon Red bricks and the blue bricks are made from Shropshire clay which makes particularly strong bricks.

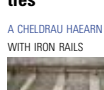
Metel

Gwneir defnydd helaeth o fetelau megis plwm a haearn ar Reilffordd Llangollen. Mae mwyn plwm, galena, sydd i'w gael yng nghalchfaen gogledd-ddwyrain Cymru, wedi cael ei gloddio ers yr Oes Efydd. Câi haearn, a ddefnyddir i gynhyrchu cleddrau, ei smeltio ym Mrymbo, ger Wrecsam. Defnyddir plwm i selio toeau.

Sliperi concrit

Concrete rail ties

A CHELDRAU HAEARN
WITH IRON RAILS



Metal

Metals such as lead and iron are used extensively on this railway. Lead ore, galena, was mined from the limestone of north-east Wales since the Bronze Age. Iron is used for the rails and was smelted at Brymbo near Wrexham. Lead is used to seal the roofs.

Beth yw RIGS?

Gall Safleoedd Geoamrywiaeth o Bwysigrwydd Rhanbarthol (Regionally Important Geodiversity Sites) fod yn unrhyw safleoedd a gaiff eu gwarchod oherwydd eu pwysigrwydd addysgol, ymchwil, hanesyddol neu esthetig.

What are RIGS?

Regionally Important Geodiversity Sites (RIGS) are any sites that are protected for their educational, scientific historical or aesthetic value.

Beth ydy geoamrywiaeth?

Geoamrywiaeth yw'r amrywiaeth o greigiau, ffosilau, mwynau a phridoedd, ynghyd â'r prosesau naturiol sy'n llunio'r dirwedd.

What is Geodiversity?

Geodiversity is the variety of rocks, fossils, minerals landforms and soils together with natural processes that shape the landscape.

Grŵpiau RIGS?

Gall unrhyw aelod o'r cyhoedd a chanddo ddiddordeb mewn cadwraeth treftadaeth y ddaear ymuno â grŵp RIGS. Mae'r grŵp yn dewis y safleoedd sydd wedyn yn cael eu gwarchod gan awdurdodau lleol. Gyd â chydweithrediad perchenogion, datblygir rhai safleoedd at ddefnydd addysgol neu gan y cyhoedd.

RIGS groups

Any member of the public with an interest in Earth heritage conservation may join a RIGS group. The groups identify sites that are then protected by the local authority. With the co-operation of the landowners, some sites are developed for educational or public use.

Os hoffech ymuno â grŵp RIGS yn yr ardal hon, cysyllter â:

If you would like to join a RIGS-group in north east Wales, please contact:

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www.ukrigs.org.uk

www.newrigs.org

www.geologists.org.uk

www.llangollen-railway.co.uk

Mae Cyngor Cefn Gwlad Cymru yn cefnogi sefydlu Safleoedd Geoamrywiaeth o Bwysigrwydd Rhanbarthol

The Countryside Council for Wales supports the establishment of Regionally Important Geodiversity Sites

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Lluniau: J. Malpas a R. Roberts Photography J. Malpas & R. Roberts



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Gwibdaith trwy'r gorffennol

Taith ddaearegol ar y trên
trwy Ddyffryn Dyfrdwy, Llangollen

Steaming through the past

A geological rail trail
of the Dee Valley, Llangollen



Golygfa o'r awyr o Ddyffryn Dyfrdwy yng nghyffiniau Llangollen - Awyrlun © Pixaerial
Aerial view of the Dee Valley at Llangollen - Aerial photograph © Pixaerial

Tirwedd a luniwyd gan ddaeareg

Rhwng Corwen a Llangollen mae creigiau'r fro, sef tywodfeini a cherrig llaid Silwraidd, i'w gweld yn aml yng ngwely'r afon. Yn ddiweddarach yn eu hanes, cafodd y creigiau hyn eu gogwyddo a'u ffawtio gan symudiadau daear. Wrth gael eu cywasgu, cawsant eu plygu ar ffurf y llythyren U.

Mewn rhai mannau cafodd y cerrig llaid eu cywasgu'n enbyd, gan ffurfio llechfaen o ansawdd da a gaiff ei gloddio hyd heddiw. Gellir gweld y chwareli hyn yn uchel ar lechweddau'r dyffryn. Mae dyffryn afon Dyfrdwy, y gellir ei olrhain o'r gorllewin tua'r dwyrain, wedi'i reoli'n rhannol gan ffawtio Llangollen a Llandysilio (gweler y croestoriad).

Yn ystod yr Oes Iâ ddiwethaf roedd y dyffryn yn llawn iâ a gâi ei fwydo gan rewlifau a oedd yn llifo o flynyddoedd Eryri a'r ucheldiroedd amgylchynol cyfagos ac yn creu dyffryn ar ffurf y llythyren U. Yn ogystal ag erydu'r tir, byddai'r iâ wedi cludo meini o Eryri tua'r dwyrain. Mae'r deunydd a adawyd ar y tir wedi i'r iâ ddadmer yn cynnwys til (cerrig a chreigiau mâl), tywod a graean, a meini dyfod.

Landscape shaped by geology

Between Corwen and Llangollen the underlying geology is Silurian sandstones and mudstones, which are often seen in the river bed. Later mountain building events have compressed these rocks, faulting and tilting them (see cross-section). This compression folded the rocks into a U-shape.

In some areas the mudstones have been compressed so much, forming good quality slate, which is still quarried locally. The remains of these slate workings can be seen high up on the sides of the valley. The west-east flow of the River Dee here is partly controlled by two of faults in the rocks, namely the Llangollen and Llandysilio faults (see cross section).

During the last Ice Age the valley was filled by ice fed from the mountains of Snowdonia and the surrounding higher ground, scraping away at the sides of the valley to form a U-shape. As well as its erosive action, the ice would have carried material eastwards from Snowdonia. The material left behind when the ice melted is made up of till (ground-up rock), sand, gravel and erratics.

Datblygiad a luniwyd gan ddaeareg

Mae daeareg Dyffryn Dyfrdwy wedi dylanwadu'n fawr iawn ar sut mae pobl wedi datblygu'r ardal. Cafodd llechi o chwareli Dyffryn Dyfrdwy eu hallforio i bedwar ban byd ac maent yn cael eu cloddio hyd heddiw ym Mwlich yr Oernant. Câi calchfaen Eglwyseg ei gloddio hefyd ac erbyn hyn defnyddir yr hen chwareli ar gyfer gweithgareddau hamdden megis dringo a cherdded. Cafodd y gamlas, y rheilffordd ac, yn ddiweddarach, ffordd yr A5 eu hadeiladu ar lawr lled wastad y dyffryn er mwyn cludo nwyddau a phobl i'r ardal ac allan ohoni. Mae modd gwerthfawrogi treftadaeth ddaearegol yr ardal drwy ddilyn nifer o lwybrau cerdded hir – Llwybr Dyffryn Dyfrdwy, Llwybr Gogledd y Berwyn a Llwybr Clawdd Offa.

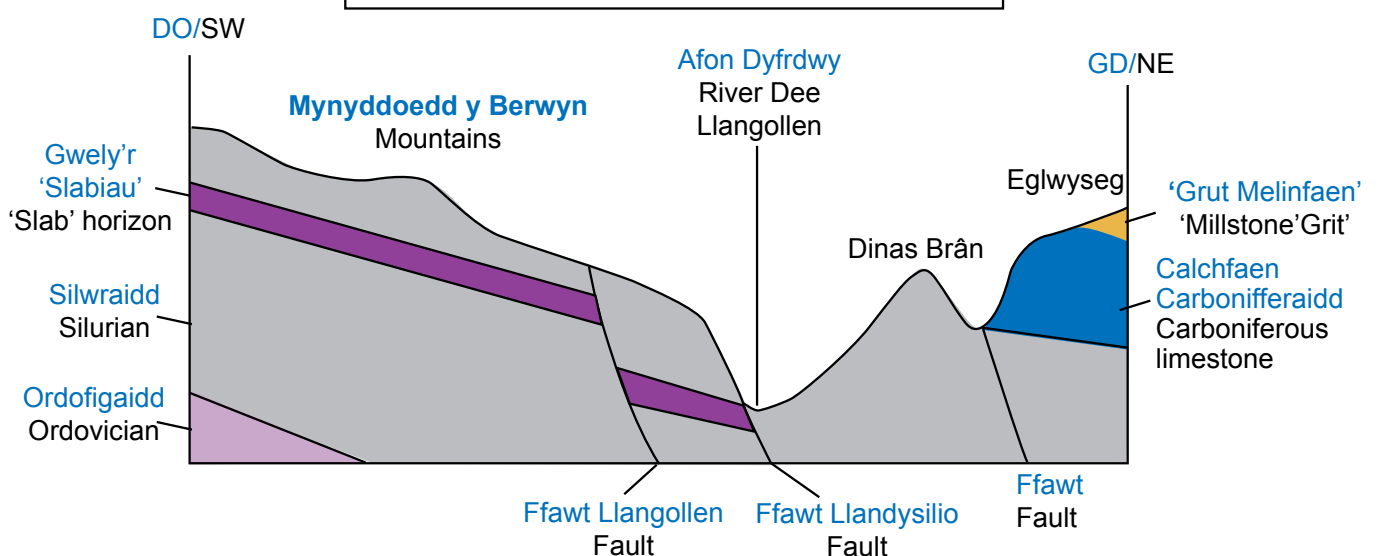
Development shaped by geology

The geology of the Dee Valley has had a strong influence on how humans have used the area. Local slate from the quarries in the Dee Valley has been exported around the world and is still being quarried at the Horseshoe Pass. The limestone of the Eglwyseg was also quarried and the disused quarries are now used for leisure activities such as walking and climbing. The canal, the railway and later the A5 were built on the relatively flat valley floor to move goods and people to and from the area. The geological heritage of the area is well served by several long distance walks - the Dee Valley Way, the North Berwyn Way and Offa's Dyke Path.

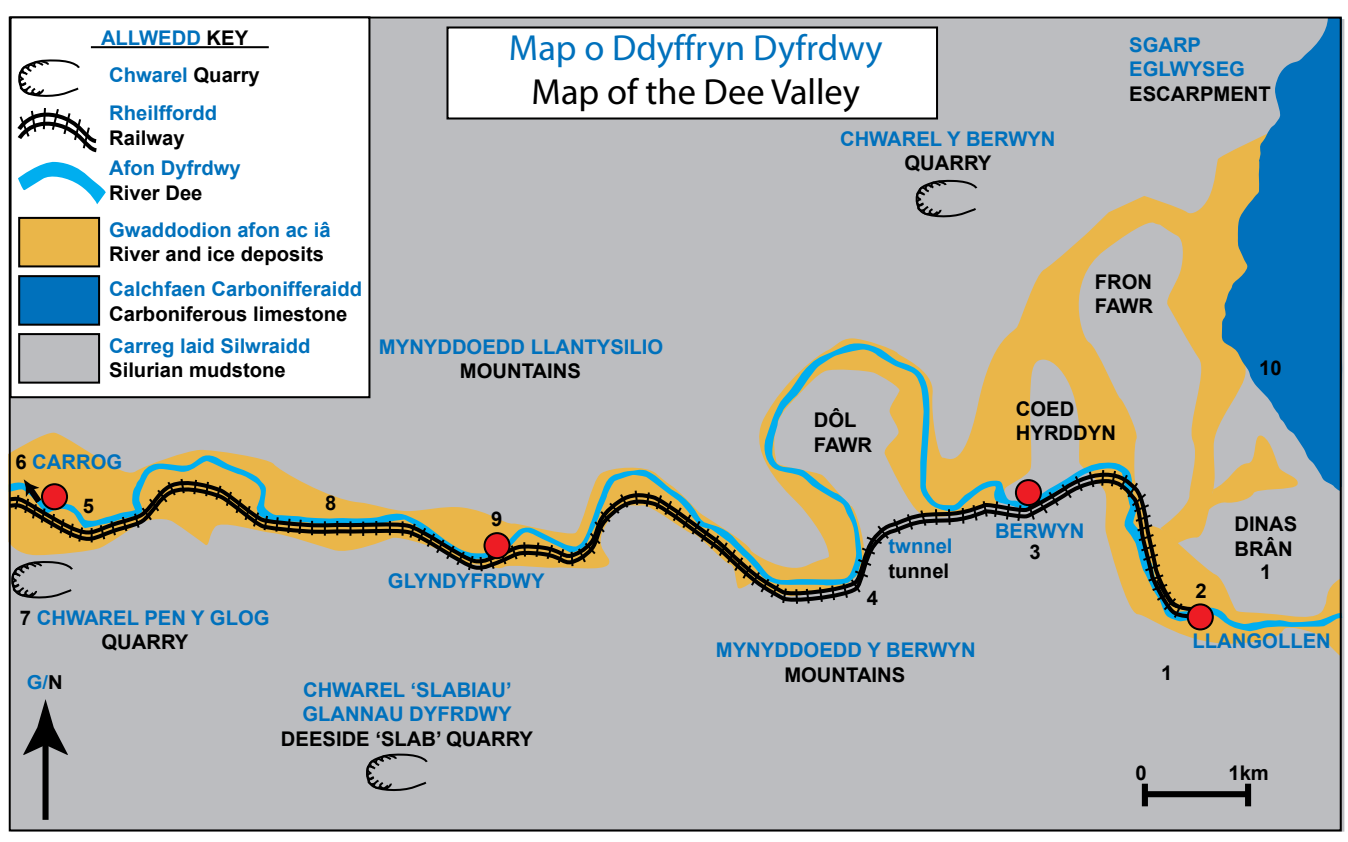


Arhosfa Glannau Dyfrdwy
Deeside Halt

Croestoriad daearegol ar draws Ddyffryn Dyfrdwy Geological cross-section across the Dee Valley



Yr Oes Iâ Diwethaf
Cwaternaid
2
Miliwn o flynyddoedd yn ôl
Y Cyfnod Trydyddol
Y Cyfnod Trydyddol
CAINOSŪG
Y Cyfnod Trydyddol
Marwolaeth y Deinosoriaid
65
Cretasig
Adar Cyntaf
MESOSŪG
Jwrasig
Triasig
248
Permaidd
Carbonifferaidd
Coedwigoedd Cyntaf
PALEOSŪG
Defonaidd
Silwraidd
Ordofigaidd
Cambriaidd
545
Cyn - Cambriaidd
3400
Creigiâu Hynaf Prydain
4600
Flurfiad y Byd



1 Yr olygfa o'r orsaf
Yr ochr draw i'r afon, i'r de o Llangollen, cwyt mynyddoedd y Berwyn. Dyddodwyd y cerrig llaid silwraidd y naddwyd y mynyddoedd hyn ohonynt mewn basn cefnforol dwfn iawn tua 420 miliwn o flynyddoedd yn ôl pan orweddai Cymru yn hemisffer y de. Cawsai llechfeini'r ardal eu cloddio ers blynnyddoedd lawer. Mae modd gweld y chwareli ar lechweddau'r brynau uwchlaw Dyffryn Dyfrdwy. Tua'r gogledd, mae Castell Dinas Brân, safle bryngaer o'r Oes Haearn a chastell dafieilidig yn dyddio o'r 13g., yn bwrw ei drem dros Llangollen. Saif y castell, hen gadarnle tywysogion Powys Fadog, ar frig cerrig llaid silwraidd a gloddiwyd i godi'r bryngaer, y castell a'i ragfuria.



1 View from station
Across the River Dee to the south, above Llangollen, are the Berwyn Mountains. These are Silurian mudstones deposited in a very deep ocean about 420 million years ago when Wales lay in the southern hemisphere. These rocks have been quarried for slate for many years. The quarries can be seen in the hills up above the Dee Valley. Overlooking Llangollen, to the north, is Castell Dinas Brân, the prominent ruined Iron Age hillfort and 13th Century castle of the princes of Powys Fadog. The castle occupies an outcrop of Silurian mudstone which was quarried to build the hillfort, castle and ramparts.

2 Gorsaf Llangollen
Codwyd yr orsaf a'i muriau cynhaliol o Dywodfaen Cefn a gloddiwyd yn ardal Wrecsam. Dyddodwyd y tywodfaen Carbonifferaidd hwn ar ffurf traeth pan oedd Cymru yn y trofannau, tua 320 miliwn o flynyddoedd yn ôl. Ar y to ceir llechi porffor, o Lanberis yn ôl pob tebyg. Codwyd y caban signalau o friciau coch Rhiwabon, a gâi eu cynhyrchu ger Wrecsam, a'r manylion o friciau peirianyddol glas Sir Amwythig. Câr briciau eu cludo i'r ardal ar y rheilffordd.



2 Llangollen Station:
The station and retaining walls are built of Cefn Sandstone quarried from the Wrexham area. The Cefn Sandstone is Carboniferous in age and was deposited in a beach setting when Wales was in the tropics some 320 million years ago. The roof is purple slate, probably from Llanberis. The signal box was built from Ruabon Red bricks, made near Wrexham, and the detail is Shropshire Blue engineering brick. These materials would have been brought to Llangollen by the railway.

3 Gorsaf y Berwyn
Codwyd yr orsaf hon o friciau melyn a gynhyrchwyd yng ngogledd-ddwyrain Cymru, yn ôl pob tebyg, ond adeiladwyd pontydd y ffordd a'r rheilffordd o'r un garreg â gorsaf Llangollen. Saif gorsaf y Berwyn ym mhen gorllewinol y ceunant y mae afon Dyfrdwy yn llifo drwyddo. Dyma'r drydedd bont i'w chodi yma. Sgubwyd ymaith y ddwy bont flaenorol adeg llifogydd mawr 1870 a 1928.



3 Berwyn Station
The station is built of yellow brick probably from north east Wales but the road and rail bridges are built of the same stone as Llangollen Station. Berwyn Station is at the head of the Dee Gorge where the valley narrows. This is the third bridge here as the previous two were washed away during violent flooding in 1870 and 1928.

4 Pen draw'r twnnel
Y tu hwnt i'r twnnel cawn ein hunain yn rhan o Safle o Ddiddordeb Gwyddonol Arbennig (SoDdGA) Afon Dyfrdwy. Hysbyswyd y rhan hon o afon Dyfrdwy am ei diddordeb daearegol a biolegol. Dyma un o'r manau gorau yng ngwledydd Prydain i astudio'r modd y mae afon yn datblygu. Awgryma presenoldeb hen lannau a cherlannau uwchlaw lefel bresennol afon Dyfrdwy fod iddi hanes hir a chymhleth ac ei bod hi, ar adegau, wedi tyrchu'r tir yn rymus iawn. Yma, mae'r afon wedi erydu ystum mawr ac iddo ochr allanol serth ac ochr fewnol mwy graddol a nodweddir gan hen gerlannau a glannau.



4 Exit of Tunnel
At the end of the tunnel we enter part of the River Dee Site of Special Scientific Interest (SSSI). This length of the River Dee is notified for its geological and biological interest. This section is one of the best places in Great Britain to study how a river develops. The presence of banks and terraces above the current river level suggests that the history of the river is long and complex and that, at times, it cut down with greater vigour. The river has eroded a large meander (loop) with a steep outer bend and a more gradual inner bend with old terraces and fossil river banks.

5 Gorsaf Carrog
Yn wahanol i'r gorsafedd eraill, codwyd gorsaf Carrog o gerrig llaid silwraidd tywyll, lleol. Tywodfaen Cefn, carreg a oedd yn haws i'w naddu, yw'r congffeini a chilbyst y ffenestri. Ar y to, gwnaed defnydd o dri math o lechen, a ddeuai o chwareli gogledd Cymru a rhai lleol. Mae'n bosibl y cafodd y plwm sy'n selio'r toeau, y ffenestri bae a'r sinneai ei gloddio'n lleol oherwydd yr oedd mwynloddio plwm yn ddiwydiant pwysig yng ngogledd Cymru. Ym Mwynglawdd, ger Wrecsam, câi plwm ei gloddio o'r cyfnod cynhanes hyd 1914.



5 Carrog Station
Carrog Station, in contrast to the others we have seen, is built of local, dark Silurian mudstone. The quoins (corner stones) and window frames are pale, Cefn Sandstone which was easier to shape. The decorative roof uses three different slates, from local and North Wales quarries. The lead that seals the roofs, bay windows and chimneys, may have been mined locally as lead mining was an important industry in North Wales. Minera near Wrexham mined lead from prehistoric times until 1914.

6 Mae'r rheilffordd wedi'i hymestyn i arhosfa Bonwyn erbyn hyn
6 Railway now extended to Bonwm Halt



Dychwelyd / Return

7 Chwarel lechi Pen y Glog
Mae tomennydd Chwarel lechi Pen y Glog (Penarth) i'w gweld fry ar ochr ddeheuol y dyffryn. Roedd gwaith cloddio'r llechfaen yn esgor ar bentyrau anferth o gerrig rwbela a gafodd eu gwaredu dros y llechweddau. Yn ystod blynnyddoedd olaf y 19g. a blynnyddoedd cynnar yr 20g. archwiliwyd y chwareli hyn gan dair daearegwraig arloesol, sef Gertrude Elles, Ethel Woods a Margaret Crosfield. Esgorodd eu gwaith ar astudiaeth bwysig yn dwyn y teitl British Silurian Graptolites, a gyhoeddwyd yn 1918. Yn y fan yma y cafodd Gertrude Elles hyd i un o'r planhigion tir cynharaf, sydd tua 420 o filiynau o flynyddoedd oed, ac o'r herwydd dynodwyd Chwarel Pen y Glog yn SoDdGA.

7 Pen y Glôg Slate Quarry
The slate tips of the Pen y Glôg (Penarth) Slate Quarry are above us on the south side of the valley. Slate quarrying produces huge amounts of waste which was tipped over the hillside. During the late 19th and early 20th Century, pioneering women geologists, Gertrude Elles, Ethel Woods and Margaret Crosfield, investigated these quarries. Their efforts resulted in the important work called British Silurian Graptolites, published in 1918. Gertrude Elles found here one of the earliest land plants, it is about 420 million years old, because of this; Pen y Glôg Quarry is protected as a Site of Special Scientific Interest (SSSI).



8 Meini dyfod rhewlifol
Cafodd y clogfeini sydd i'w gweld yn y nentydd a'r afon eu cludo yma gan iâ yn ystod yr Oes Iâ ddiwethaf. Wrth i'r iâ o Eryri symud dros y tir, cludai feini tua'r dwyrain. Yn ystod y symudiad hwn, cafodd y meini eu treulio a'u llyfnhau, cyn cael eu gwasgaru dros y tir wrth i'r iâ ddadmer tua 17,000 o flynyddoedd yn ôl.



8 Glacial Erratics
The boulders seen in the streams and river were transported here by ice during the last Ice Age. As the ice moved over the land from Snowdonia, it carried rocks with it. This movement of ice wore down and rounded the rocks, which were deposited when the ice melted about 17,000 years ago.

9 Gorsaf Glyndyfrdwy
Y maes chwarae (lle ceir maes pêl-droed ac arwydd yn datgan 'Dim gêmâu pêl!') oedd yr iard nwyddau ar gyfer inclein y lein fach, sef tramffordd Nant y Pandy i Foel Fferna a Chwareli Slabiau Glannau Dyfrdwy. O'r fan yma câi llechi eu hallforio i bedwar ban byd. Mae llwybr hyfryd yn dilyn Nant y Pandy ac yn ymuno â Llwybr Gogledd y Berwyn.



9 Glyndyfrdwy Station
The playground (football pitch with sign saying 'No ball games!') was the goods yard for the narrow gauge railway incline, the Nant y Pandy Tramway to Moel Fferna and Deeside Slab Quarries. Slate from here was exported all around the world. There is a beautiful walk up Nant y Pandy, which joins the North Berwyn Way long distance walk.

10 Golygfeydd o darren Eglwyseg
Ar eich siwrnai cewch sawl cipolwg o darren neu sgarp trawiadol Eglwyseg. Mae'r calchfeini hyn tua 350 miliwn o flynyddoedd oed ac fe'u ffurfiwyd pan orweddai'r tir sydd bellach yn Gymru yn y trofannau. Yn ystod y cyfnod hwn roedd y rhan fwyaf o ogledd Cymru dan ddyfroedd môr trofannol bas a chynnes a oedd yn llawn creaduriaid morol: cwrelau, braciopodau (cregyn môr), crinoidau (lilïau'r môr) a thrilobitau prin iawn. Ers hynny, cafodd y creigiâu eu codi a'u gogwyddo gan symudiadau daear grymus, a'u cerfio gan rewlifau. Mae sgrî wedi ymgasglu wrth odre'r darren, wrth i brosesau rhewi-dadmer ar ddiwedd yr Oes Iâ ddiwethaf chwilfrwio a disodli filiynau o ddarnau onglog o'r clogwyni calchfaen.



10 Views of Eglwyseg Escarpment
On your train journey you will see glimpses of the dramatic Eglwyseg Escarpment. These limestones are about 350 million years old and were deposited during the Lower Carboniferous Period when the area that is now Wales lay in the tropics. At this time, much of North Wales was under a warm, shallow tropical sea which was teeming with marine animals; corals, brachiopods (shellfish), crinoids (sea lilies) and rare trilobites. Since then the land has been uplifted and tilted by huge Earth movements and carved by ice. Along much of the escarpment scree has accumulated at the foot of the limestone cliffs. Millions of angular fragments have been dislodged from the escarpment through freeze-thaw processes since the end of the last Ice Age.

Last Ice Age
Quaternary
Tertiary
CENOZOIC
Extinction of Dinosaurs
65
Cretaceous
First Birds
Jurassic
MESOZOIC
Triassic
248
Permian
Carboniferous
First Forests
Devonian
400
Silurian
PALAEOZOIC
Ordovician
Cambrian
545
PRE
CAMBRIAN
3400
Oldest Rocks in Britain
4600
Earth Forms