

WALES

ANGLESEY
BRECKNOCKS.
CARDIGANS
CARMARTHENS.
CARNARVONS.
DENBIGHS.
FLINTS.
GLAMORGANS.
MERIONETHS.
~~MONMOUTH~~
MONTGOMS.
PEMBROKES.
RADNORS.

Bibliog. see MM 28 309

HH Thomas MM 15 241

Detrital andalusite etc
in sands of Wales.
A no. of locs given
on p. 244.

D.E. Bick "The Old Metal Mines
of Mid Wales" 5 parts (1974-78)

GW Hall "Metal Mines of Southern Wales"
(1971) GWH (1971)

FJ North (1962) "Mining for Metals in Wales." Nat Mus
Wales, Cardiff

TMT (1961) = T.M. Thomas "The Mineral Wealth of
Wales & its Exploit'n" Oliver & Boyd.

SRMRGB 2 (1923); 15 (1920); 23 (1922); 30 (1925)

ANGLESEY

OS 1" 106, also parts of 115, 107

MM 24 536 "Glaucophane" rocks (See
Llanfairpwllgwyngyll. = Crossite)

G. Brown & F. Smithson Nature (1953) 172 317 (MA 12 490)
Dickite in sandstones

G. L. (1858) 388 Minium, in veins of clay-slate with
galena. [See Pary's Mine]

Rev. R. Warner, 2nd Walk Through Wales, in 1798 (1800) p 300
Anglesey: - "quartz", mundic, pyrites.

J.R. Foster-Smith (1977) "The Mines of Anglesey and Caernarvonshire". British Mining No. 4. Northern Mine Research Soc.

W. Manning in N-F (1959) 319-333 "The Parys & Mona M's of Ang."

Acanthite

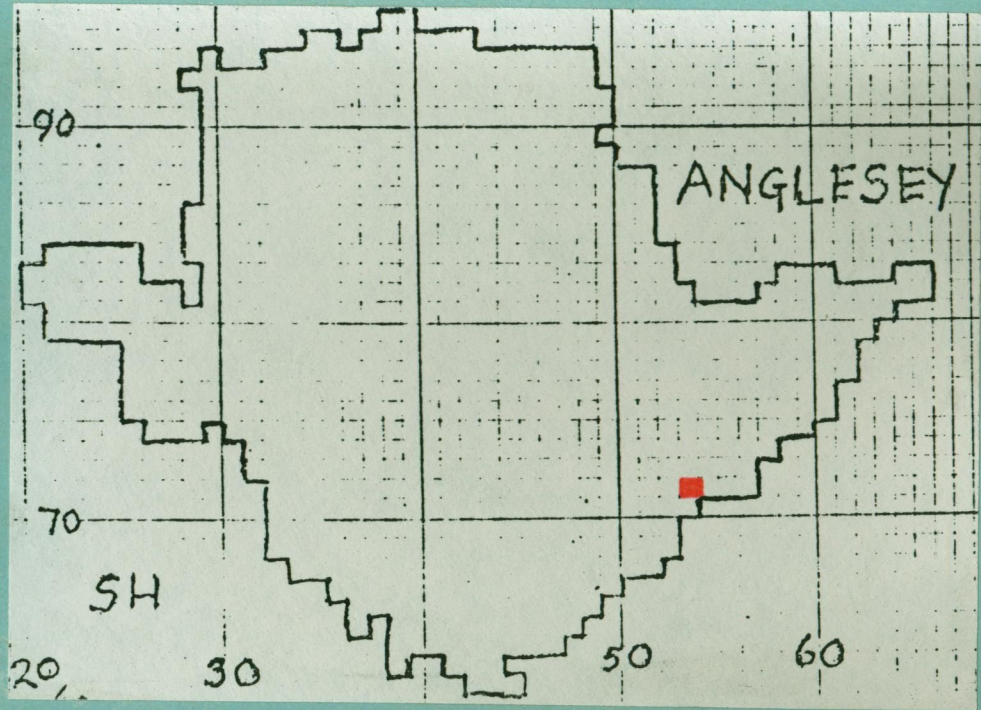
Ang

Poerys ME

Albute

Ang

Llanfair pwll ... 53 71



Allophane

Ang

Parys Mt.

Alunogen

Ang

Parys Mt (?)

Anadase

ANG

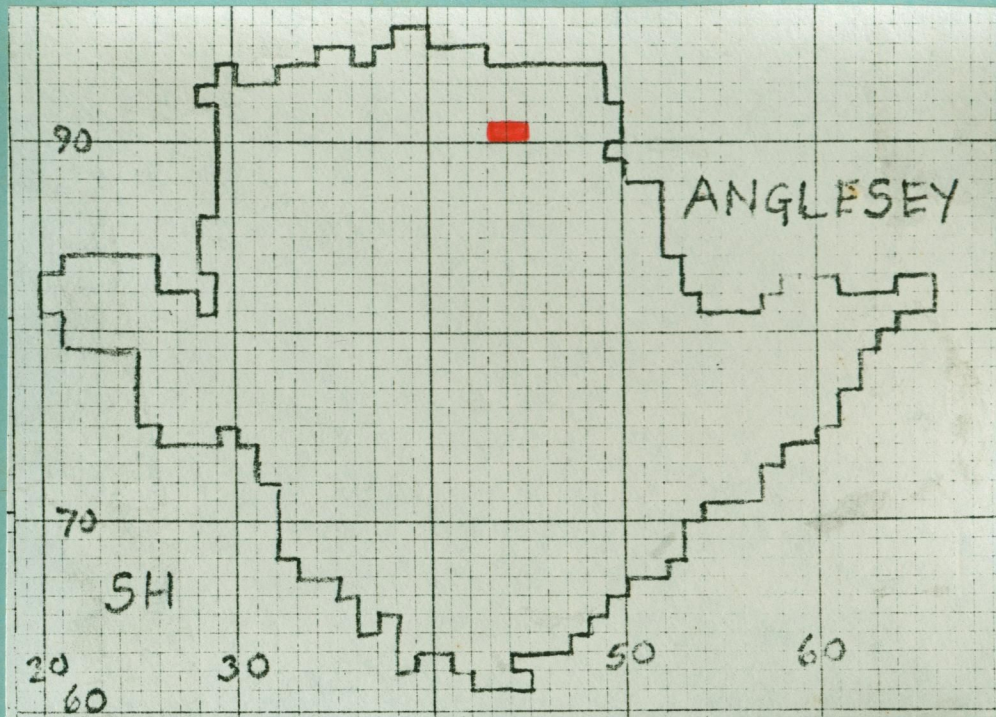
Parys ME

ANGLESITE

ANG

Mona M. 4390 4490

Parys M. 4390 4490



Anhydrite

ANG

Panyp ME

Ankerite

ANG

Pump ME

ANTIGORITE [cf serpentine]

Ang.

Rhoscelyn 2677 2777

Antlerite

Ang.

Pamp ME [??]

Aragonite

Ang

Parys Mt.

Arsenopyrite

Ang

Parys Mt

"ASBESTOS" [See also CHRYSOTILE]

ANG

Rhôscolyn 27 77

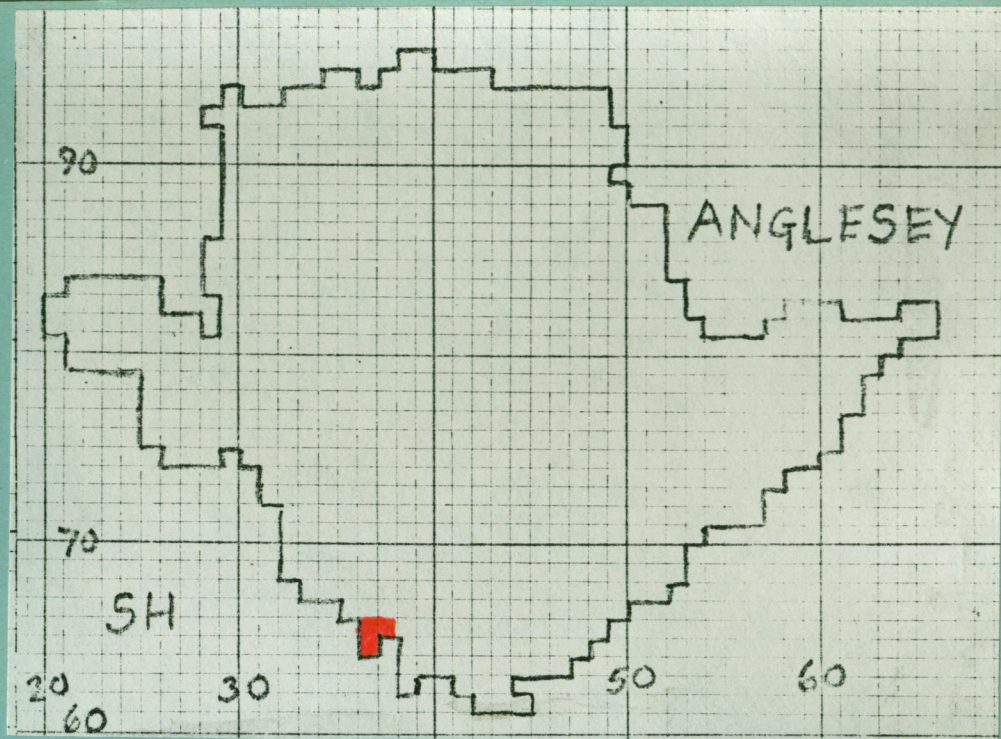
Parys Mt (?)

AXINITE

Anglesey

Llanddwyn Island

3862 3863 3962 3963



Azurite

Ang

Parys Mt(?)

Banyte

ANG

Panys ME

Basaluminite

Aug.

Pamp ME [?]

Beudantite

Arg.

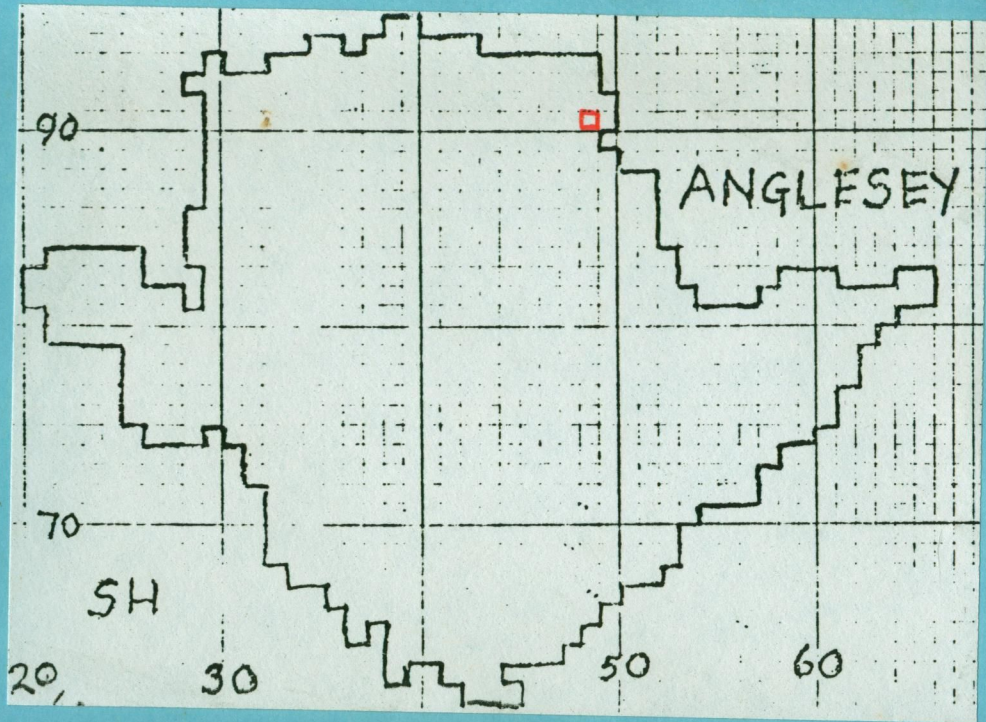
Parys Mt

Bismuth

Ang.

[Rhôs-Mynach Mⁿ in analysis (?)] 4890

Parys Mt



Bismuthinite

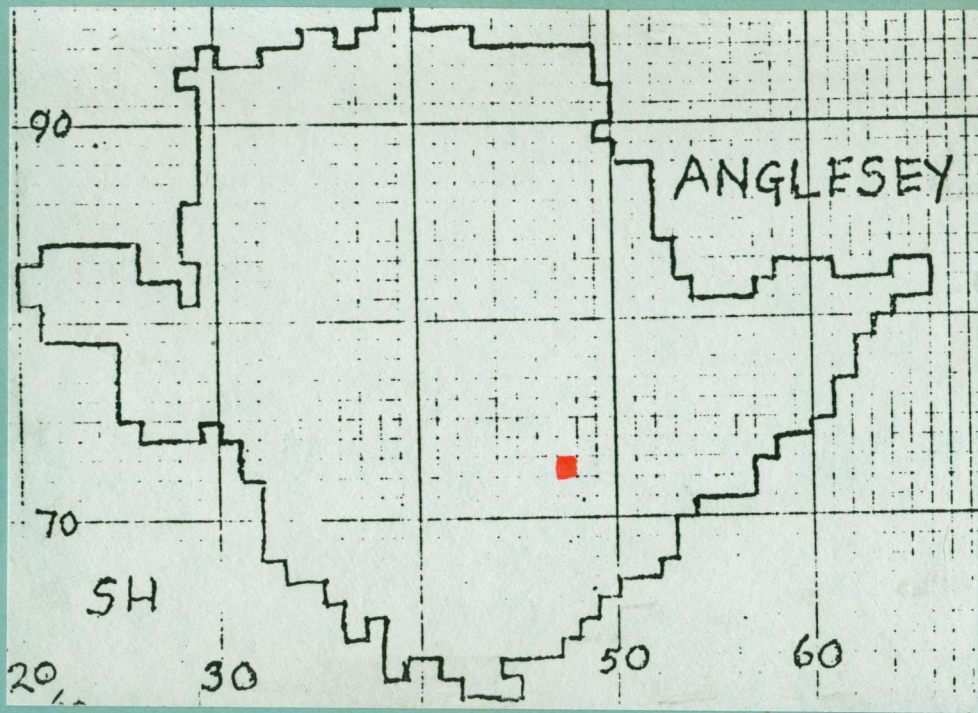
Ang

Panys M

BITUMINOUS MINERALS

Ang

Pentre-Berw (coal) 47 72



Bornite

ANG

Pang's ML

Bourbonide

ANG-

Pais ME

Brochantite

Ang

Parys ME

CALCITE

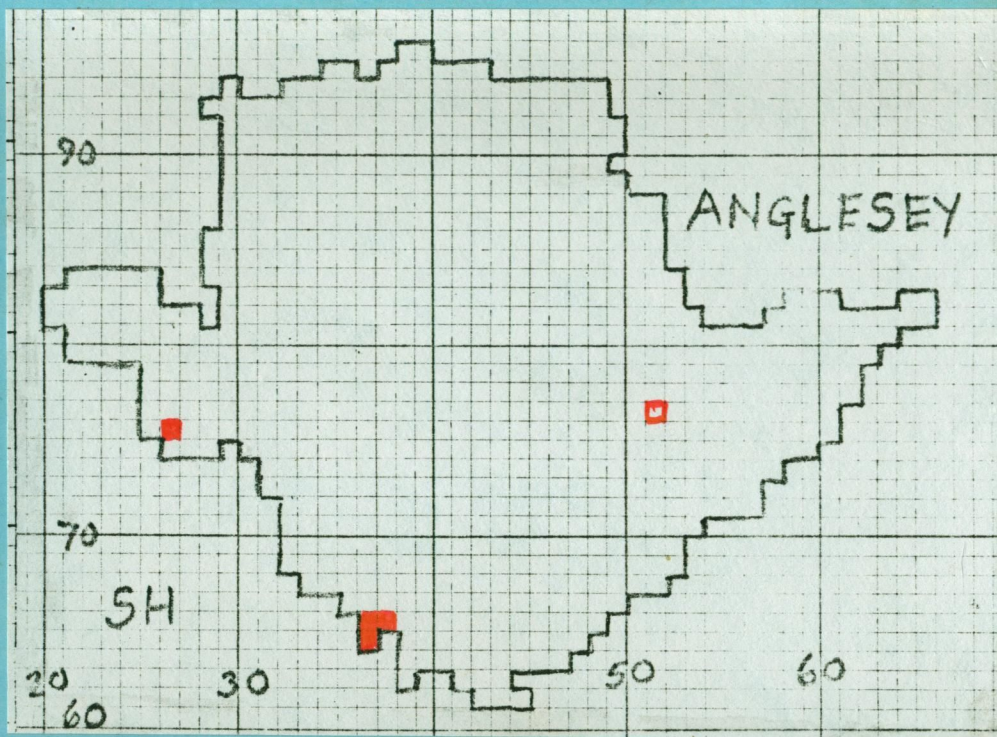
Ang

Rhoscolyn 2675

Llanddwyn Island 3862 3863 3962 3963

Tŷ-Fry (?) 5176

Parys Mt



CHALCANTHITE

ANG

Parys M. 4390 4490

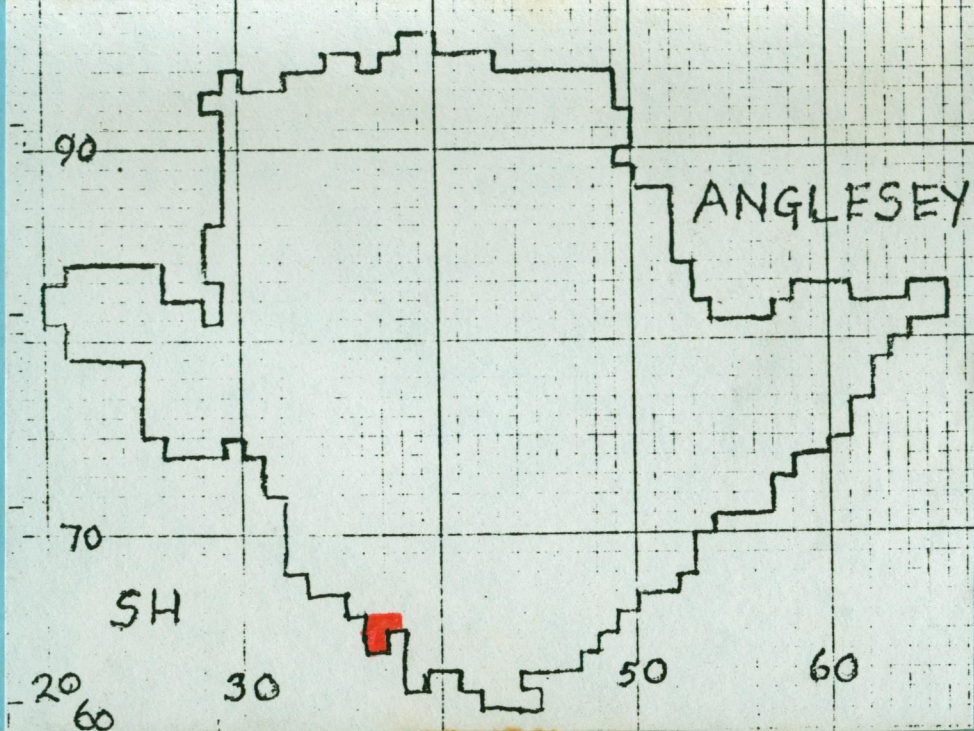
Mona M 4390 4490

Chalcedony silica

Ang.

Llanddwyn Is. (Jasper)

3862 3863 3962 3963



Chalcocite

ANG

Pomps Mt

CHALCOPYRITE

"Copper ore" (Cu)

ANG

Carmel Point 29 92

Mona M. 4390 4490

Parys M. 4390 4490

Morfa Ddu 43 90

Amwlwch 41 94

Rhôs-Mynach M 48 90

gwredog 41 90

Mynydd Pant-y-gaseg 41 94

Rhôscolyn 26 76

Copper mine creek 22 79 (Cu)

Bull Bay 4294 4293 4393 4493
(Cu)

Porth Helygen (Cu) 49 90

S. Parys M (Cu) 4 8 (2)

Gaddair M (Cu) (?) 4 9 (2)

Holyhead (Cu) 22 79 (?)

Porth-yr-Aber (Cu) (?) 48 90

Tyllau-Duon (Cu) (?) 48 92

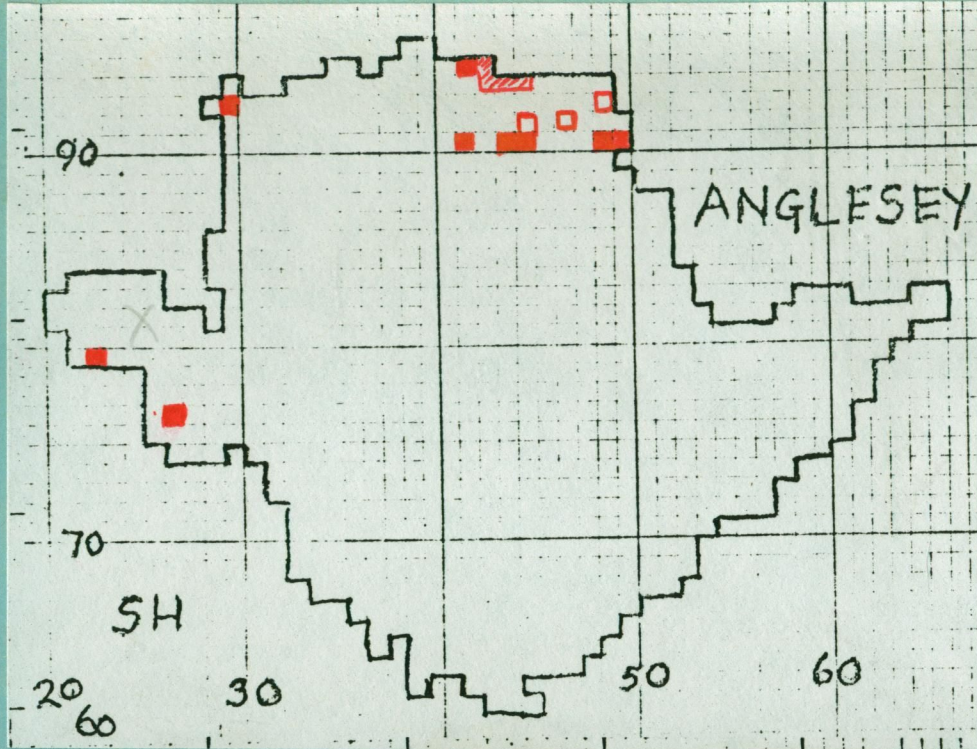
Taldreus (Cu) 29 92

Tyddyn Engaen (Cu) (?)

46 91

Llyn-coch (Cu) (?) 44 91

Ogof Gynfor (Cu) 37 94

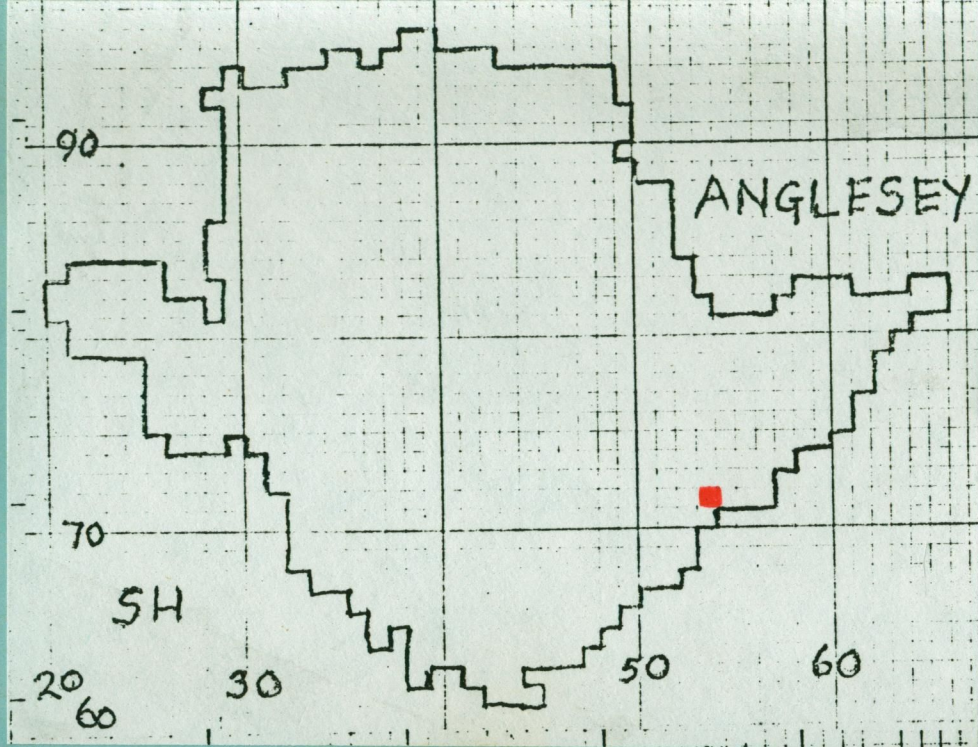


chlonte

Ang

Llanfairpwll ... 5371

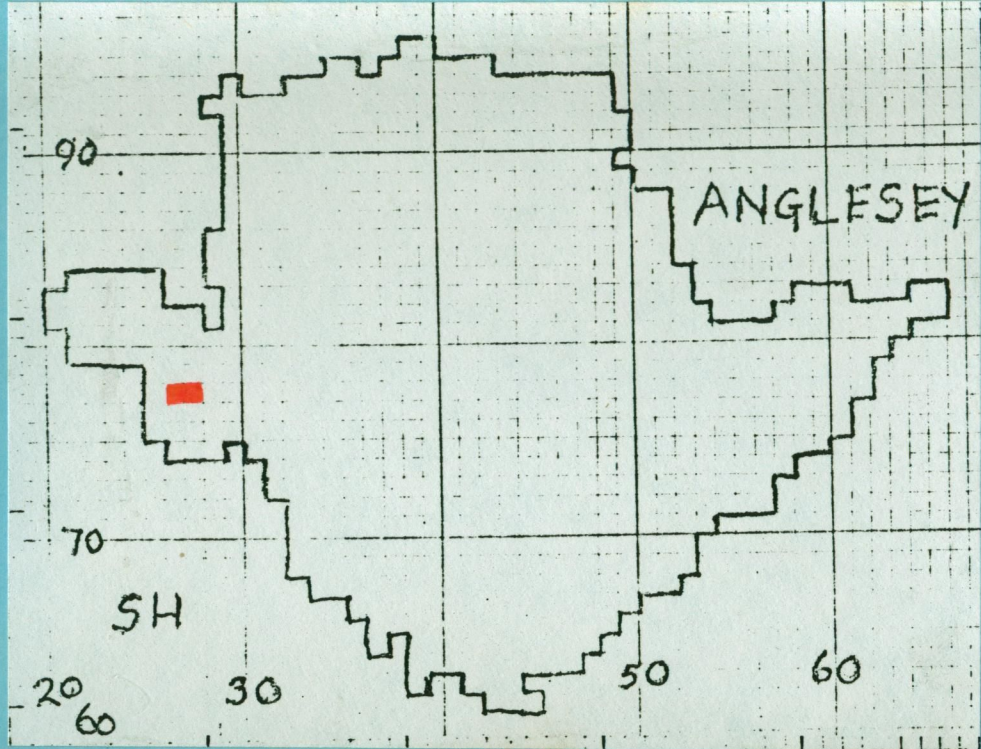
Parys Mt (?)



CHRYOTILE

Ang

Rhoscelyn 2677 2777



Copiapute

Anglesey

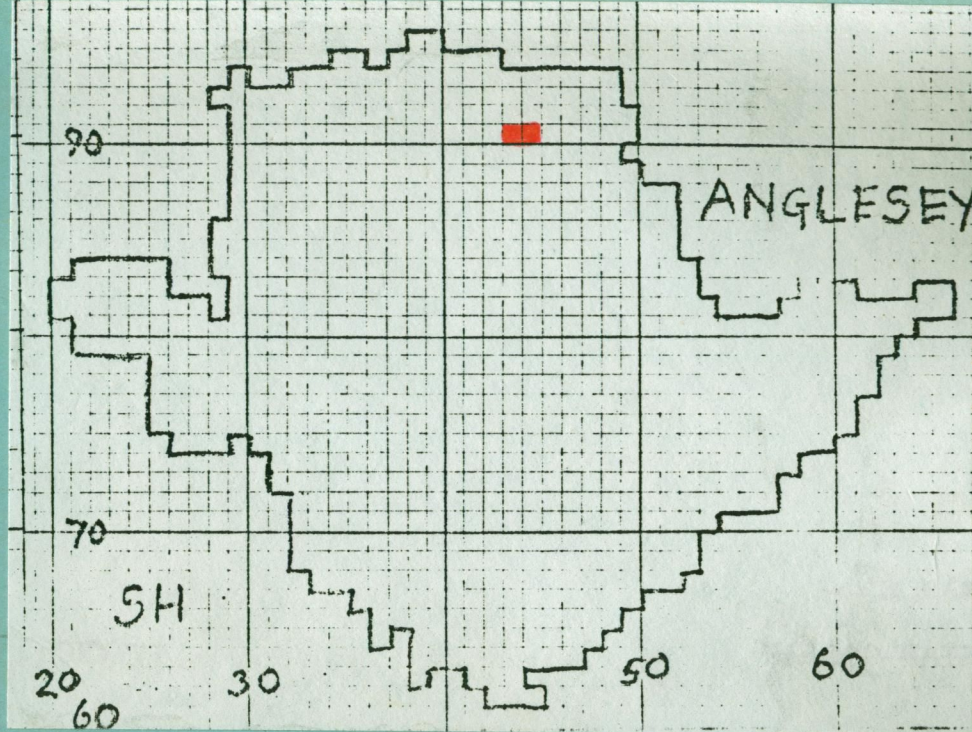
Parys Mt 4390, 4490

COPPER, NATIVE

ANG

Parys M. 4390 4490 (e in slag)

Mona M 4390 4490



Pa
NAN

Coquimbite

Ang

Parys ME

Covelline

ANG

Parys ME

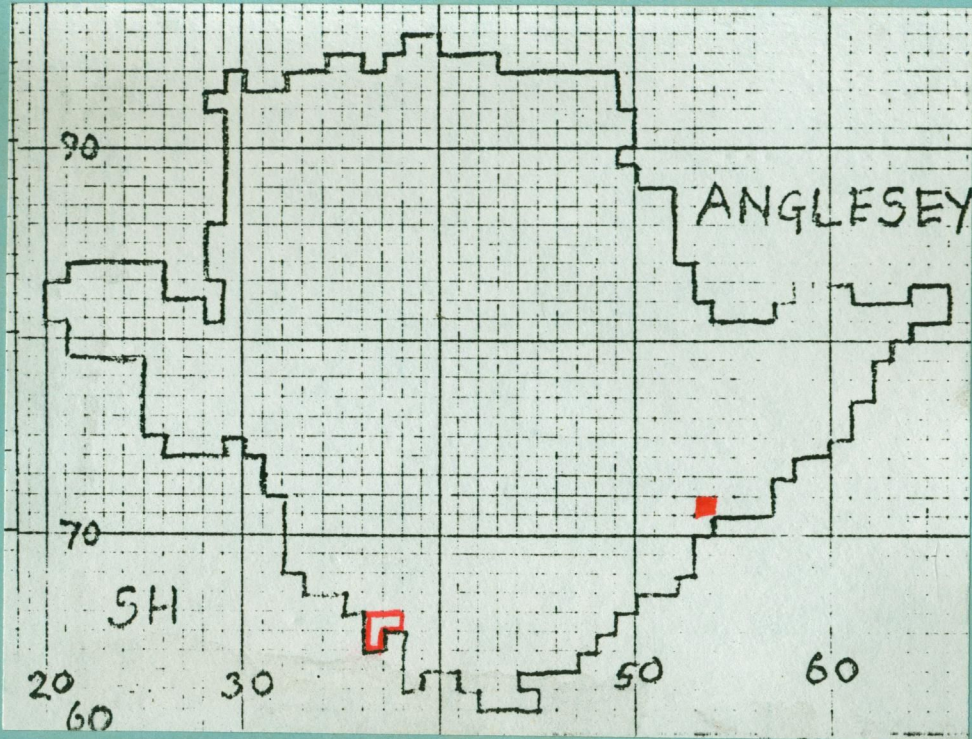
CROSSITE

ANG

Llanfairpwll... 5371

Llanddwyn Island(?)

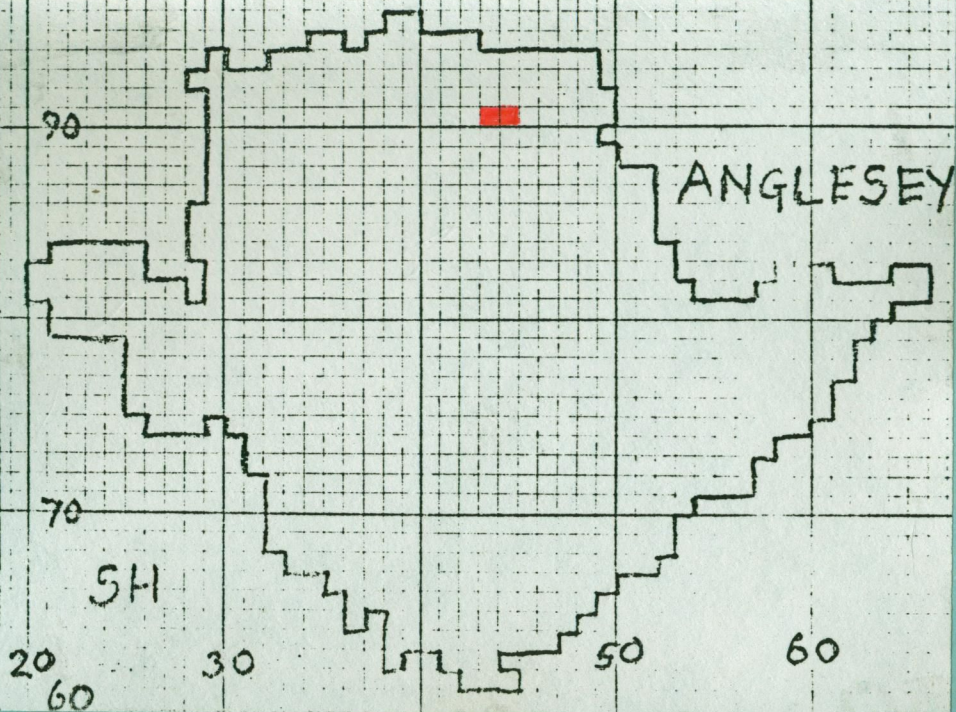
3862 3863 3962 3963



CUPRITE

ANG

Parys M. 4390 4490



Dickirk

Anglesey

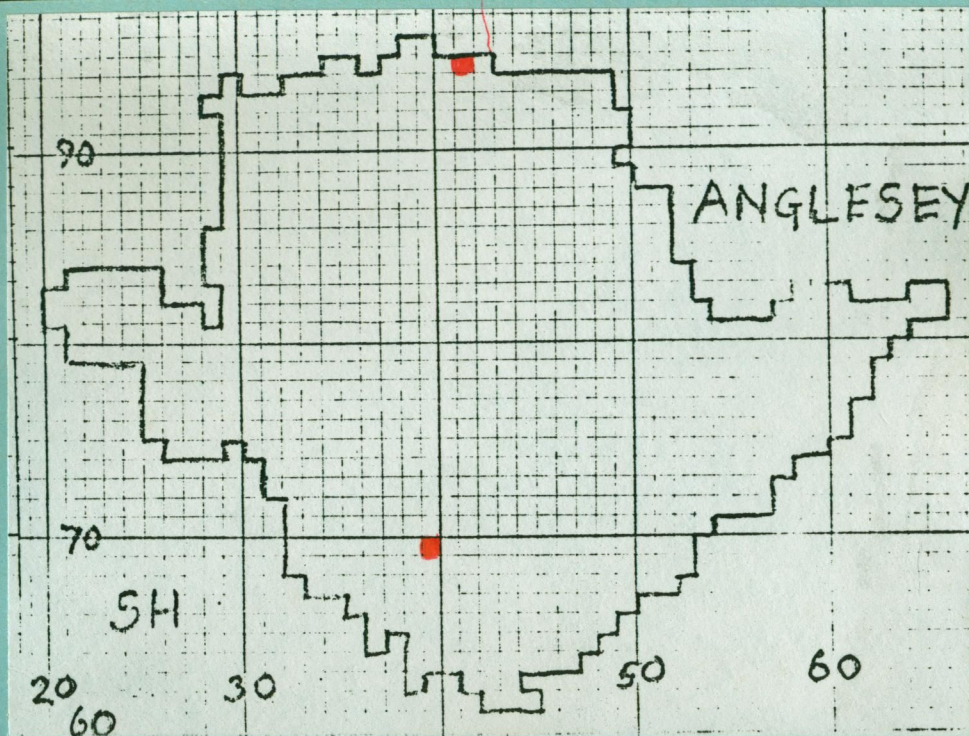
Amlwch 4194

Anglesey

Llangadwaladr 3969

Pant-y-gaseg

Mynydd



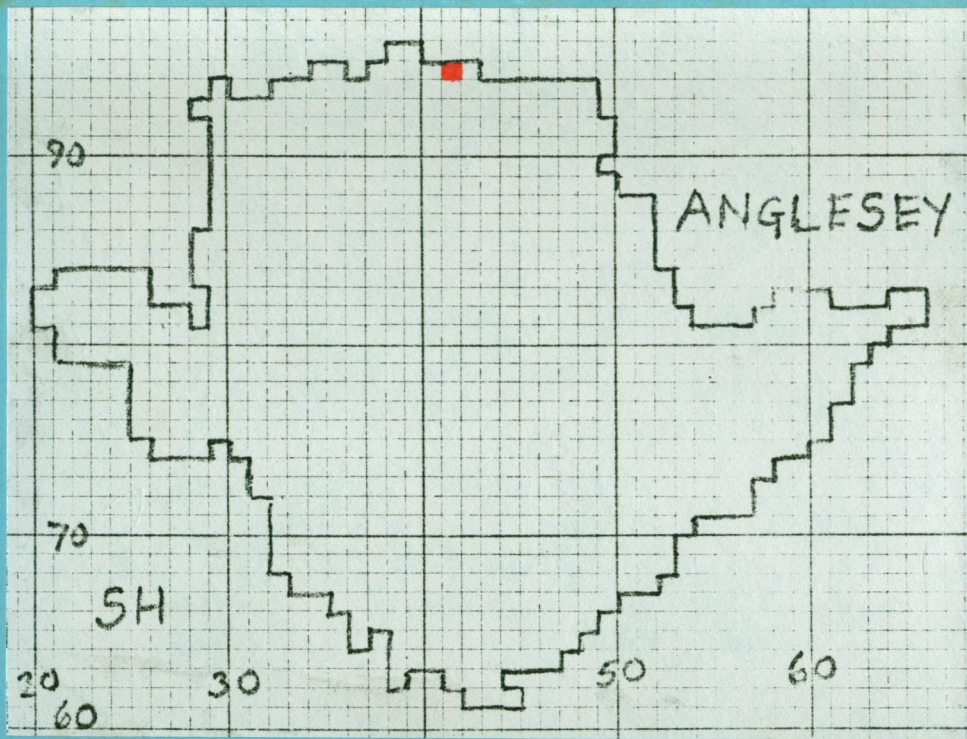
Dolomite

Ang.

Amlwch 4194

Mynydd Pant-y-gaseg 4194

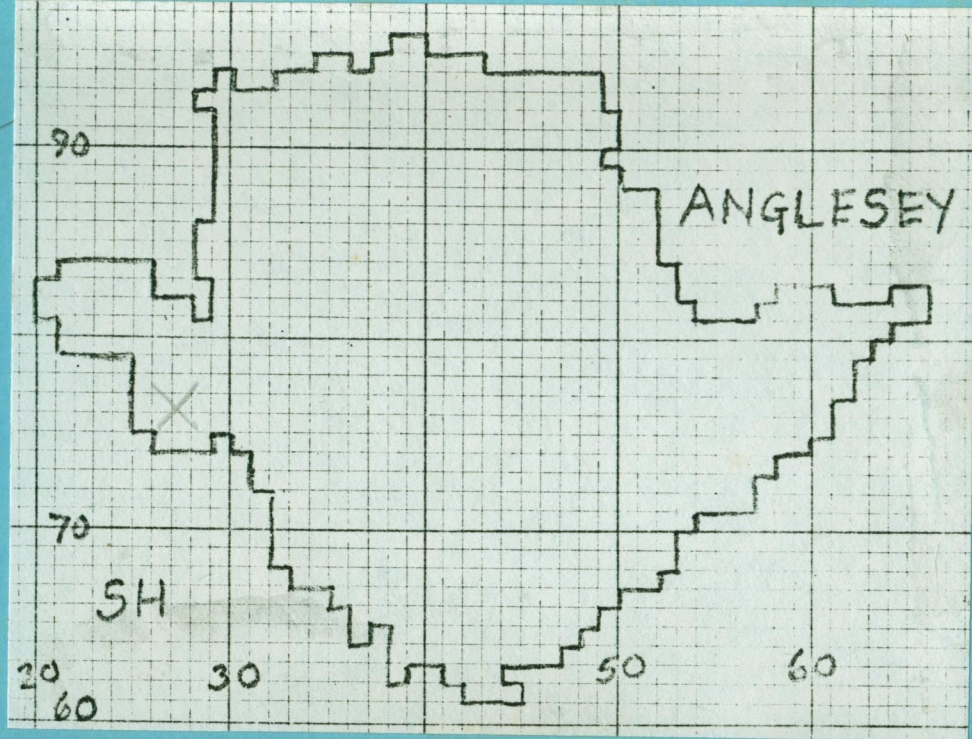
Parys ME



Enstatik

Ang.

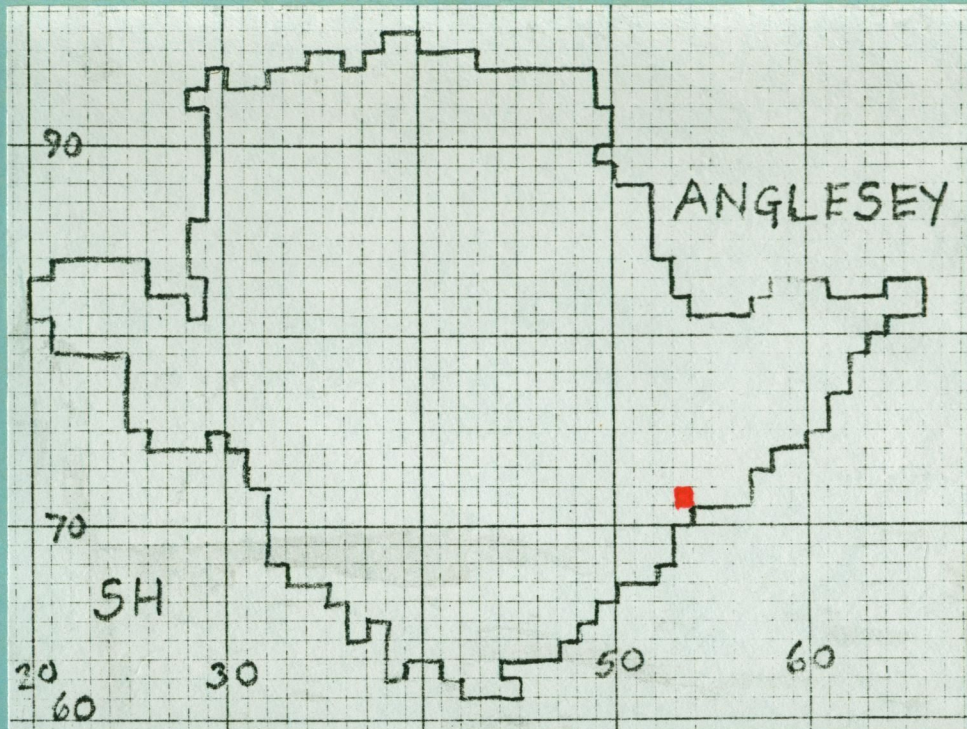
Rhoscolyn 2 7



Epidone

Ang

Llanfairpwll... 5371



Fels'ob'anyaite

Ang

Parys ME

Fibroferrite

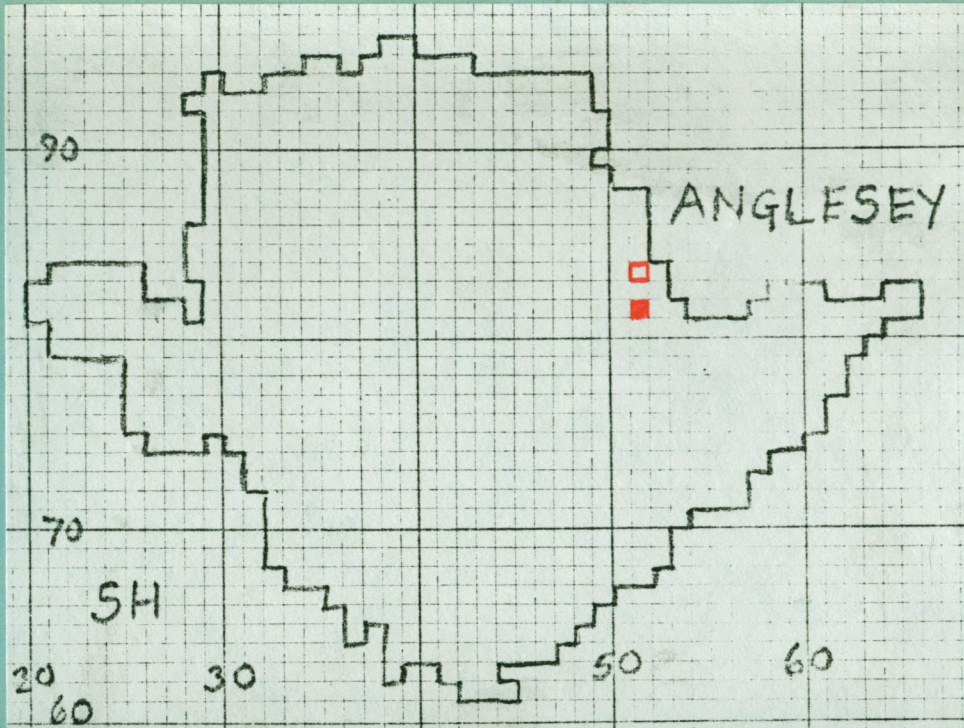
Ang.

Parys Mt

FLUORITE

Anglesey

Benllech 5181, 5183(?)



GALENA, "Lead Ore" (Pb)

ANG

Parys M. 4390 4490

Morfa Ddu 4390 4490

Anglesey

Rhos-Mynach M 4890

Bell Bay (Pb) 4293 4294 4393 4493

Tyllau Duon (Pb)(?) 4892

Llaneuddog (Pb)(?) 4688

galenobismuthite

ANG-

Pamp M

Glaucophane

Anglesey

Anglesey (error for Crossite of Llanfairpwll...)

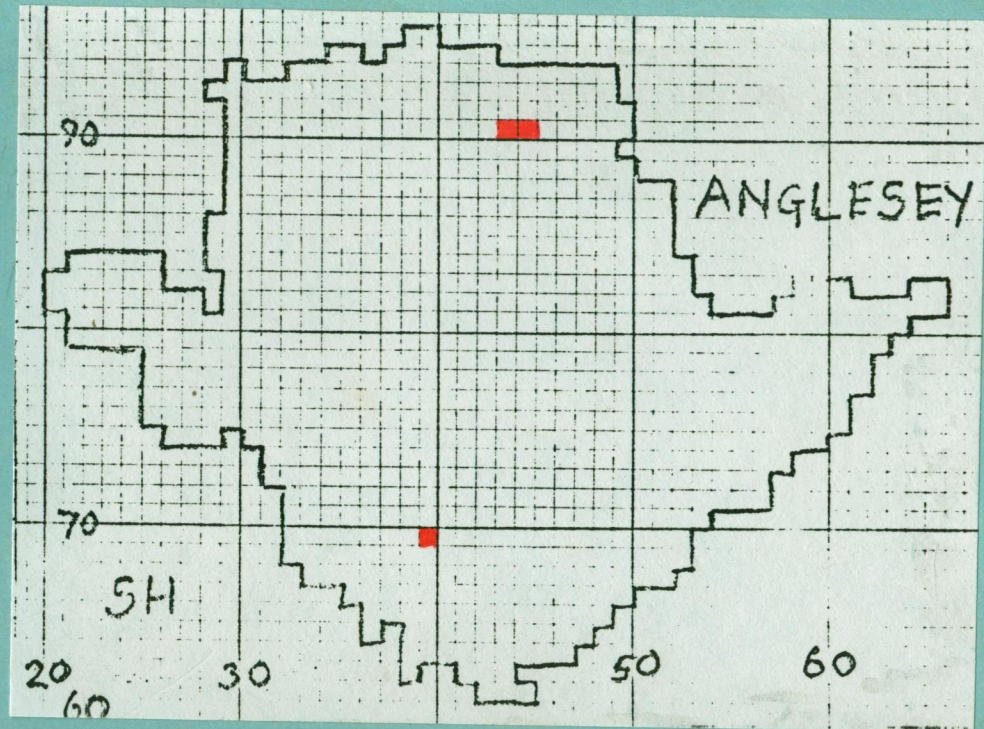
GOETHITE

("LIMONITE", OCHRES~~L~~=L)

ANG

Parys M. (L) 4390 4490

Llangadwaladr (L) 39 69

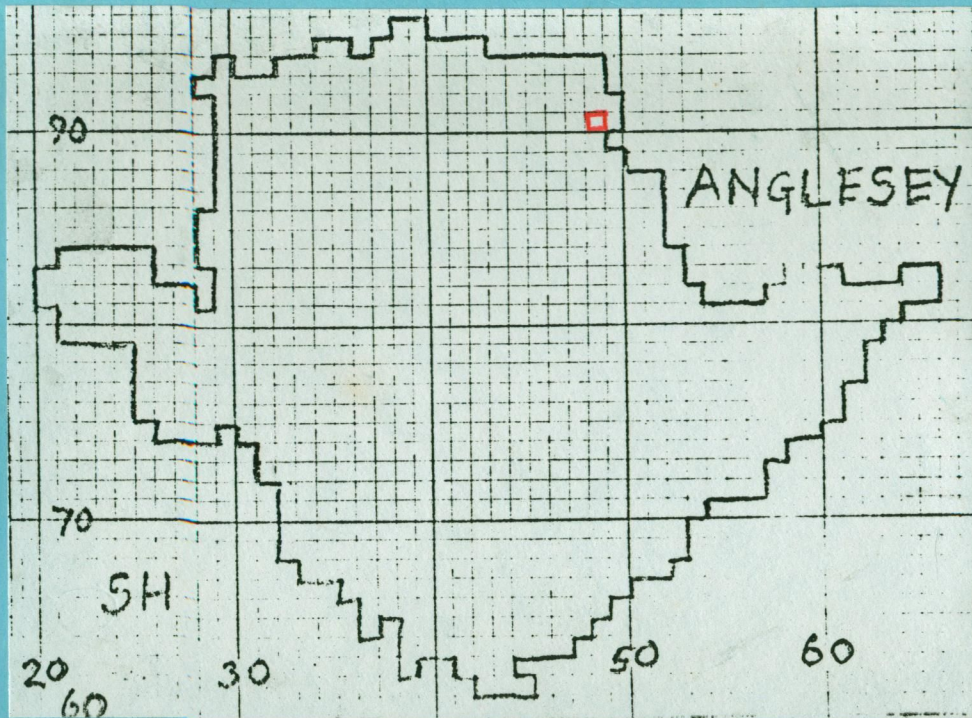


Gold

Ang

[Rhös-mynach M. - in analysis (?)] 4890

Darys M



Gunningite
 $\text{ZnSO}_4 \cdot \text{H}_2\text{O}$

Ang

Parys Mt

Gypsum

Wigwag Bay

Panys ME

Anglorey

HAEMATITE

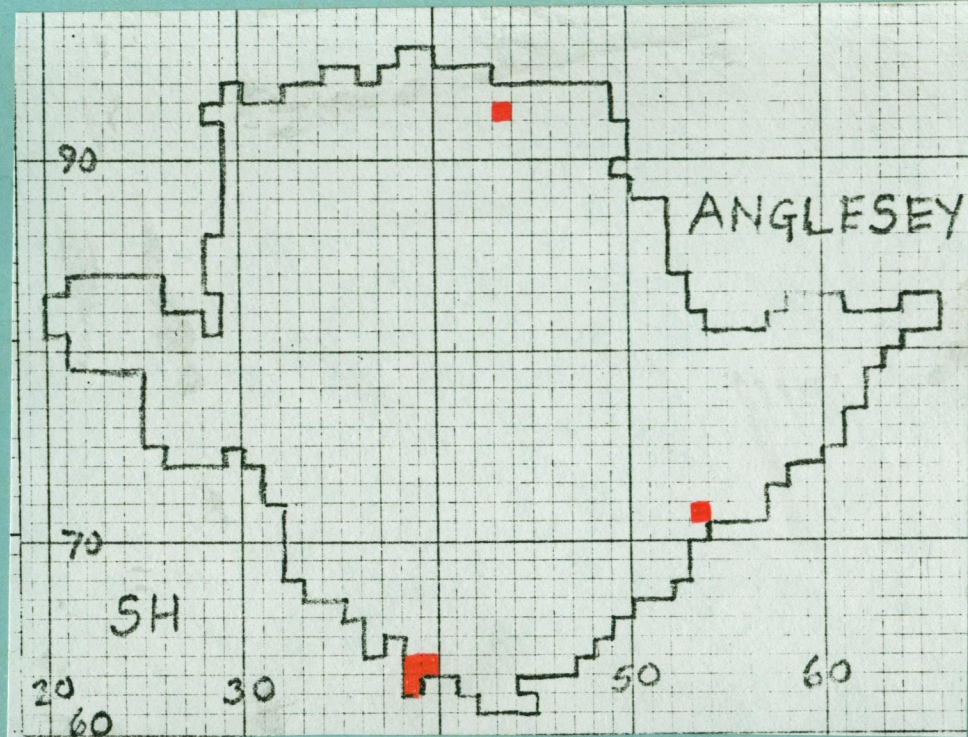
ANG

Amlwch 4392

Llanfairpwllgwyngyll 5371

Llanddwyn Island 3862 3863 3962 3963

Powp MB



Halotrichite

Anglessey

Panys Mt. 4390 4490

Hydronium jarosite

Ang.

Parys Mt.

lemerite

ANG

Panys Mt.

Jarosite

Ang

Pamp ME

Jordanite

ANG

Parg ME

Kaolinite

Ang.

Amlweh (error for dickite)

Kobellite

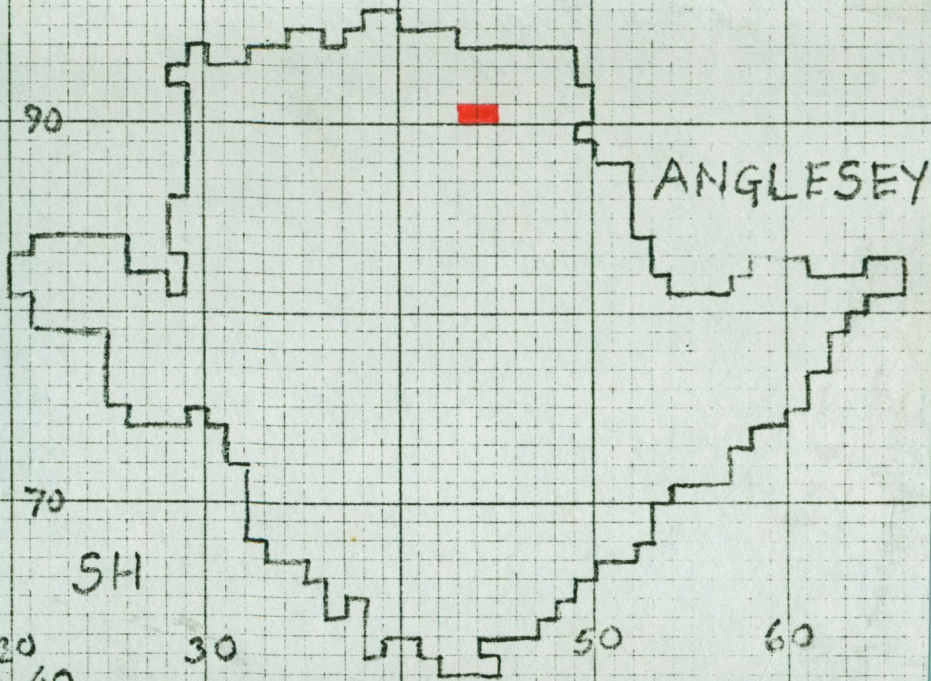
ANG

Pair M

"Hydroglockente"
(= *Leptodermocite*)

Ang. Casey

Painy mine 4390 4490 (?)

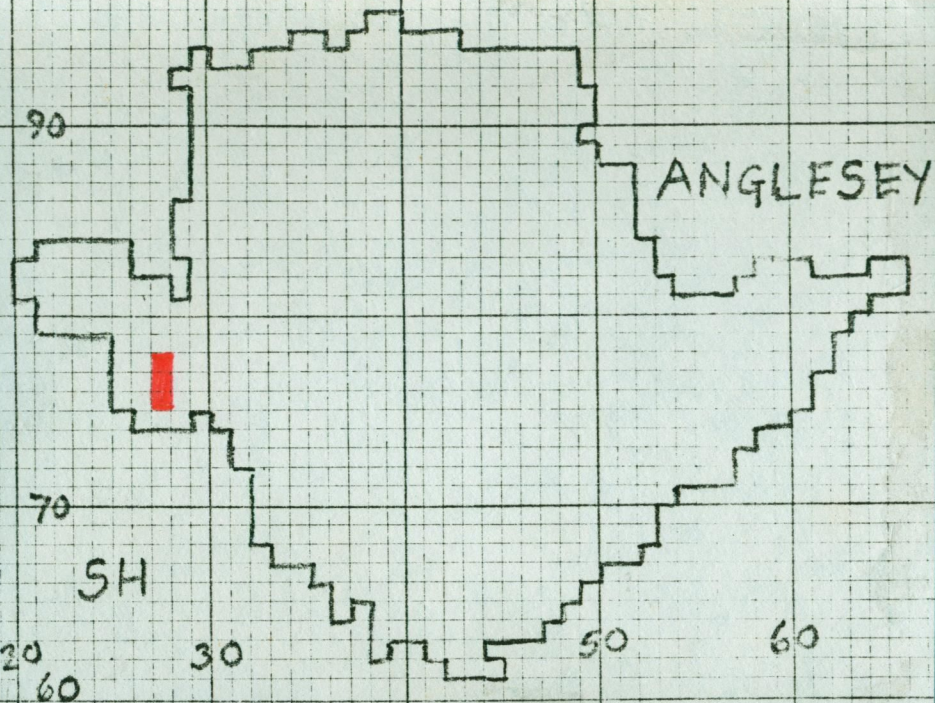


MAGNETITE

Ang

Rhoscelyn 2775 2776 2777

Pamp. Me.

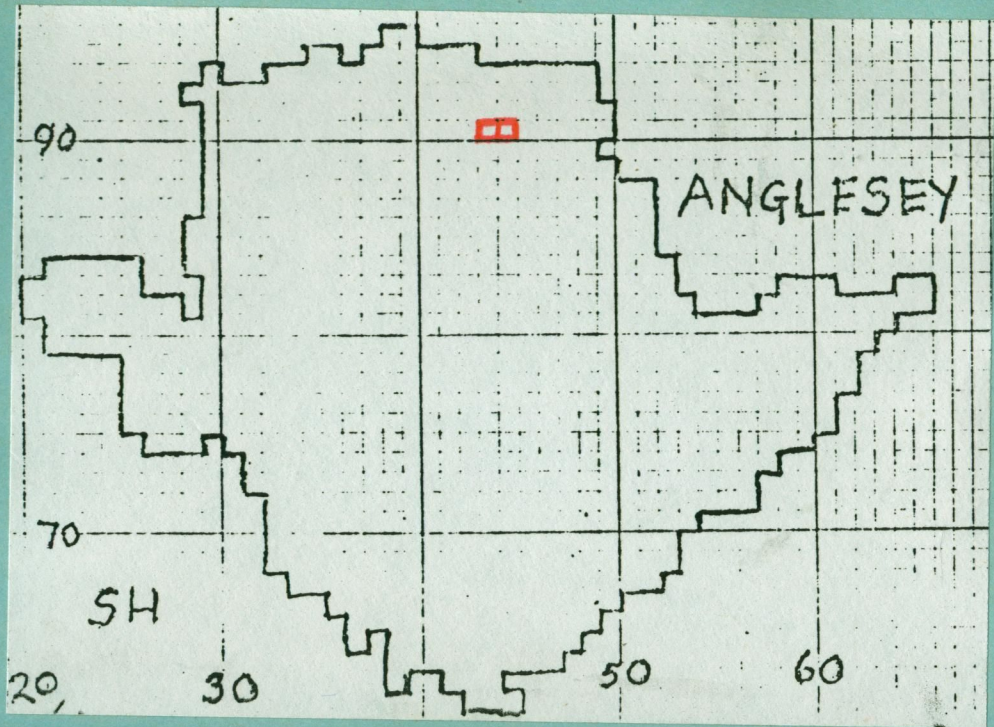


MALACHITE

ANG

Parys M.

4390 4490



Marcasite

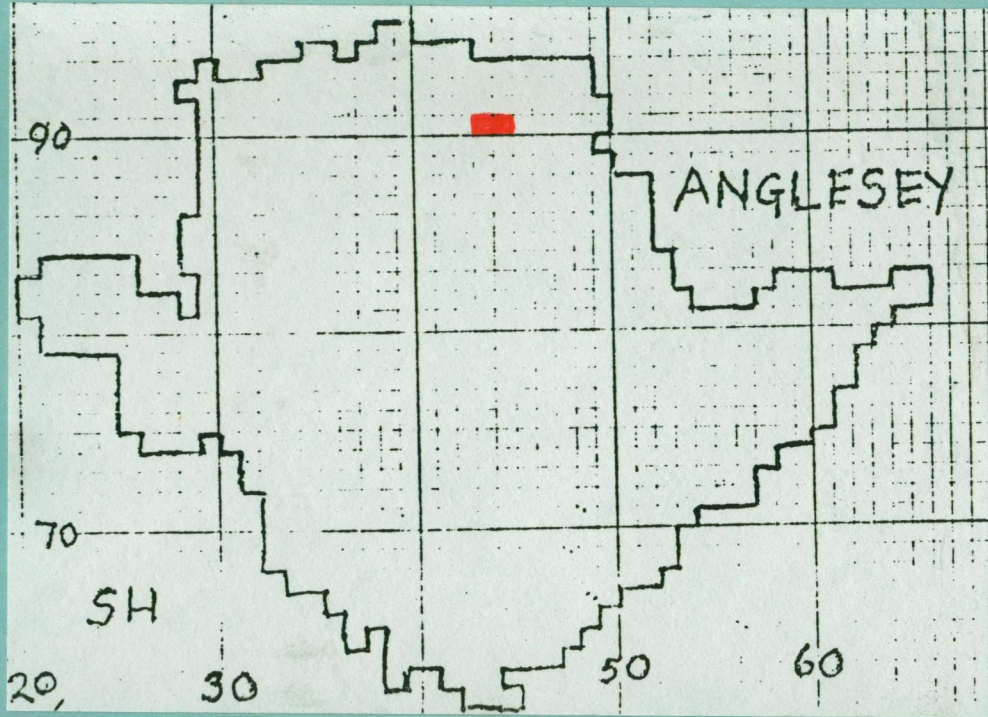
ANG-

Pump Mt

MELANTERITE

ANG

Parys M. ~~4390~~ 4490 (incl. cuprian; "PISANTE")



MINIUM

ANG

Parys M^E 4390 4490

Anglesey

Phosgenite

Pearys Mt

Ang
✓

Pickeringite

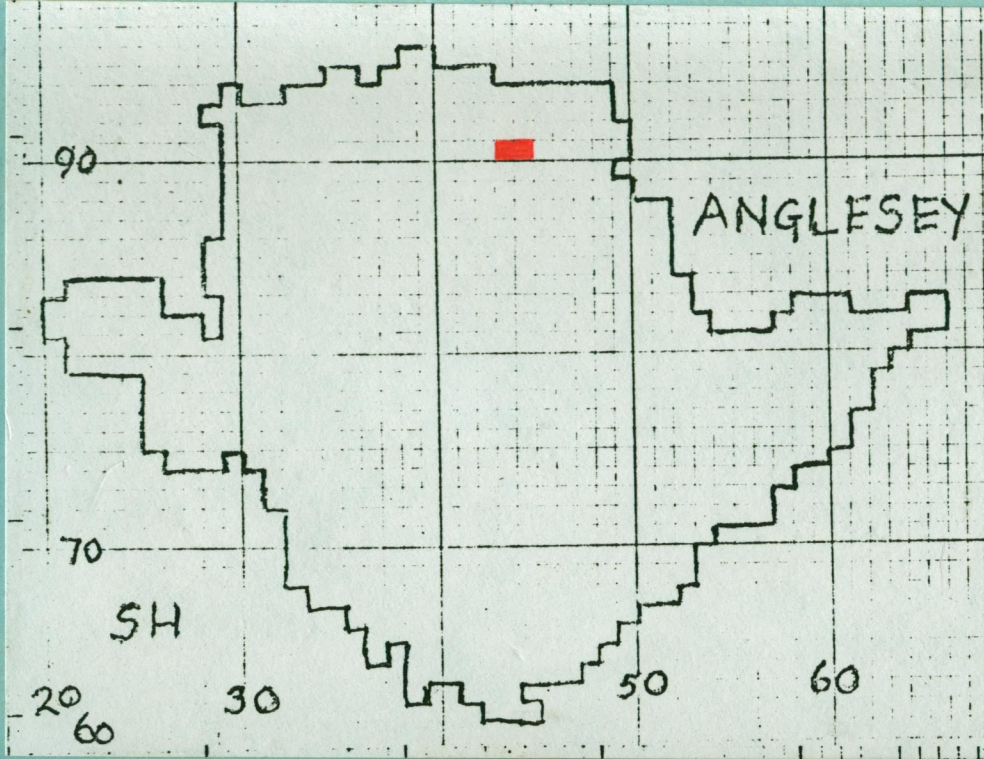
ANS-

Panp Mt ? [= halotrichite]

"PISANITE" (See McBratene)

ANG

Parys M.



PYRITE

ANG

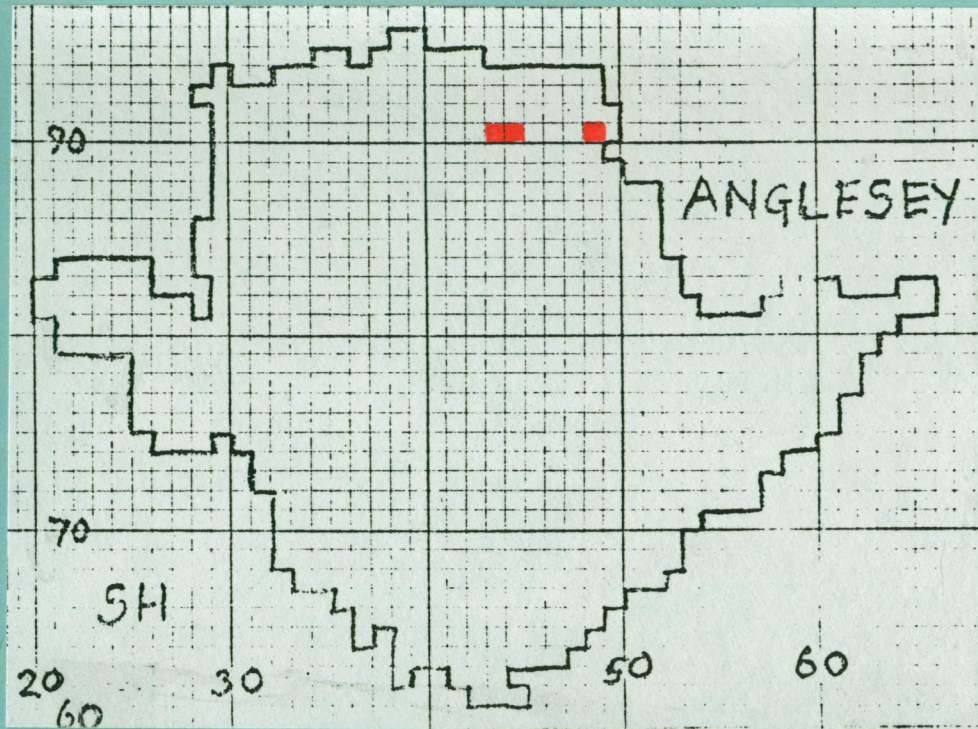
Parys M^{ts} 4390 4490

Anglesey

Monfa Ddu 4390

Monia M 4390 4490

Rhôs-Mynach M. 4890



Pyromorphite

ANG

Panys ME(?)

Pyrrhotite

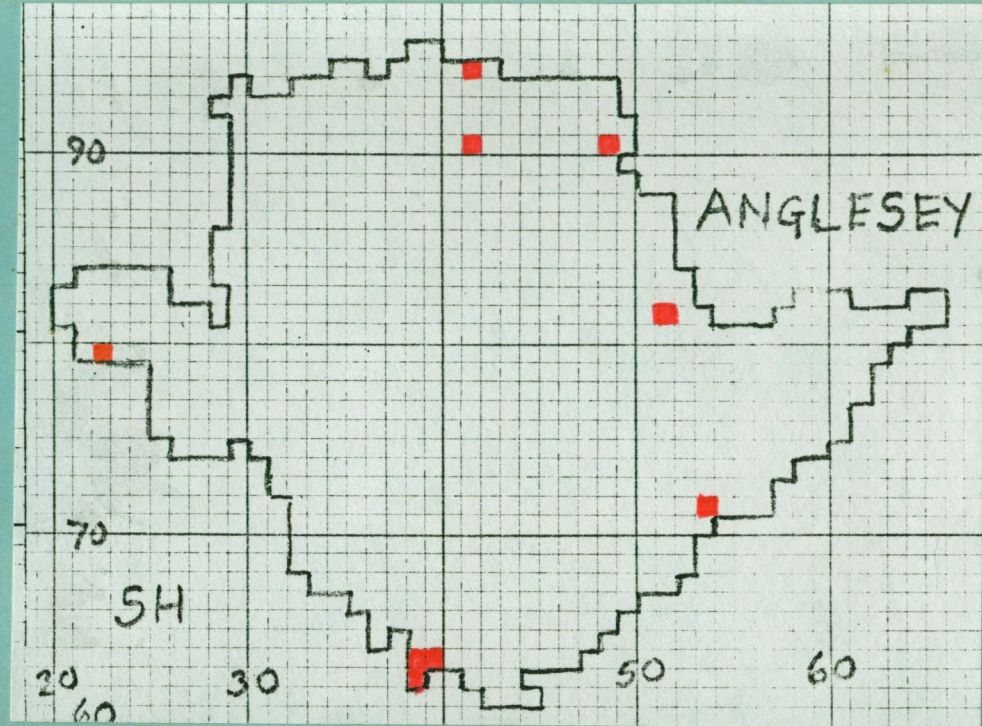
ANG

Panys ME

QUARTZ

Anglesey

Benllech 5181 Pant-y-gaseg
Llanfairpwllgwyngyll 5371 Parys ME
Anglesey
Rhos-Mynach M 4890
Gwredog 4190
Amloch 4194
Llanddwyn Island 3862 3863 3962 3963
Mynydd Pant-y-gaseg 4194
Copper Mine Creek 2279



Rancieite

Ang

Parys. Mt.

Rhodochrosite

Ang.

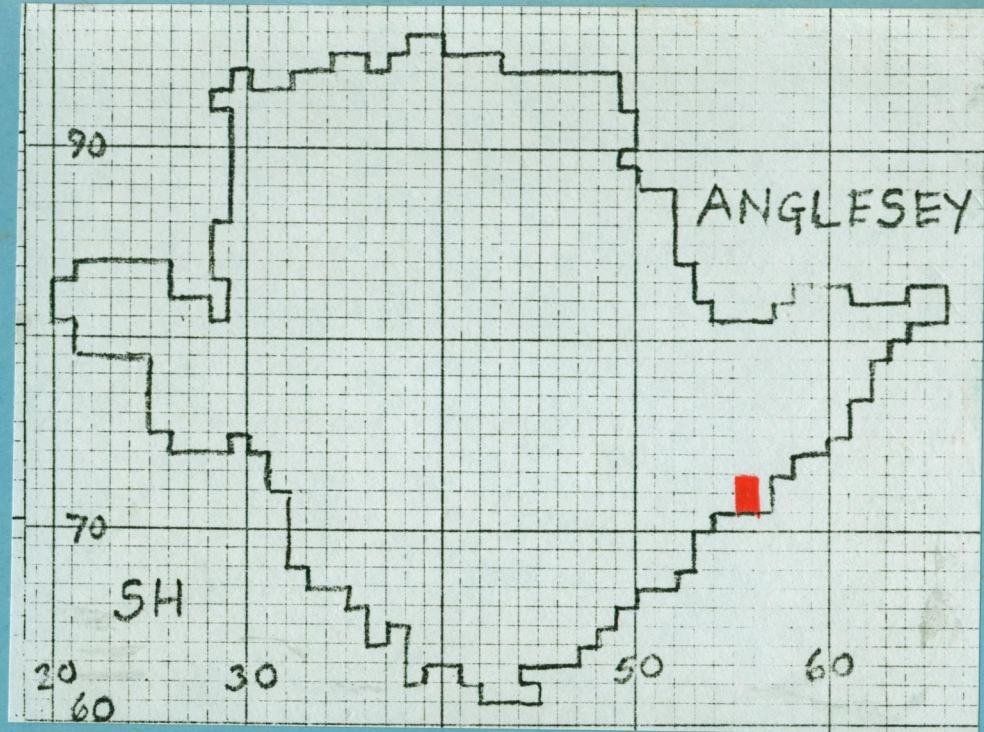
Llanddwyn Island (error?)

Ty-Fry (error?)

Rhodonite

Ang

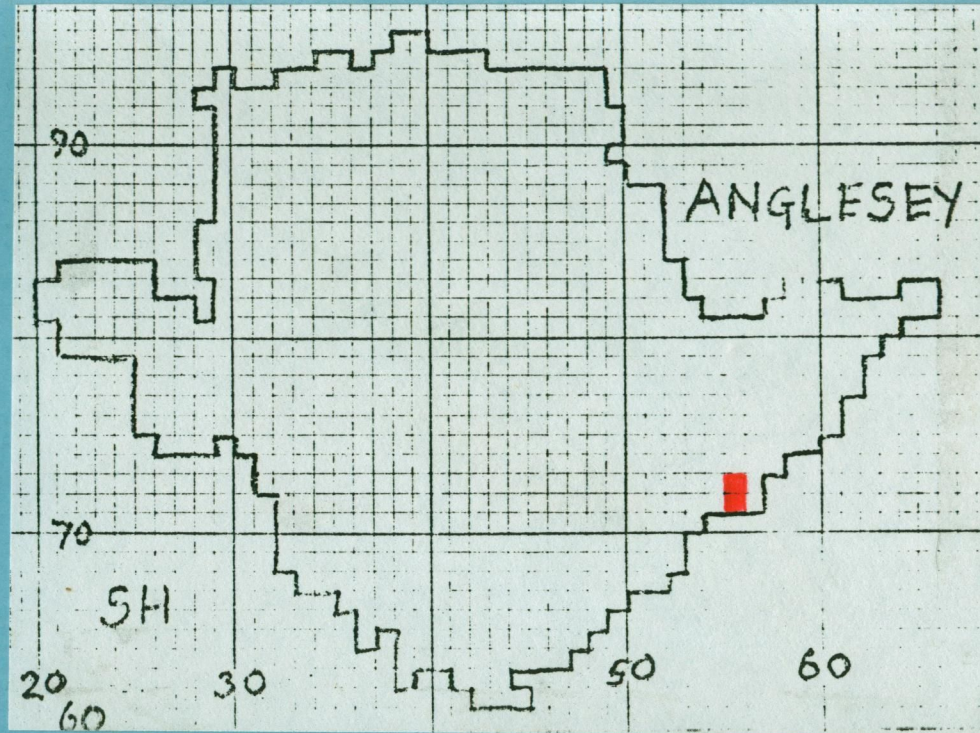
Menai Bridge 5571-5572



Romanechite
(Psilomelane)

Ang

Menai Bridge 5571 5572



RÖMERITE

Anglesen

Pays M (?) 4390 4490

Rozenite

Ang

Parys Mt.

Rutile

ANG

Panymt

"SERPENTINE" [See also ANTIGORITE]

ANG

Bullocks Q., Amlwch

Holyhead 7626→28, 7630→31, 7726-31, 7828-29.

Parys M. 4390 4490

Siderite

ANG

Pump ME

Sideronatrude

Anglesey

Lligwy Bay

Siderotil

Ang

Parys Mt

SILVER

ANG

Parys M.

4390 4490

[Rhos-Mynach M³-in analysis (?)] 4890

SPHALERITE "Zinc Ore" (Zn)

ANG

Parys M. 4390 4490

Morfa Ddu 4390

Rhôs-Mynach M 4890

Spionkopite

ANG

Panys ME

STEATITE

ANG

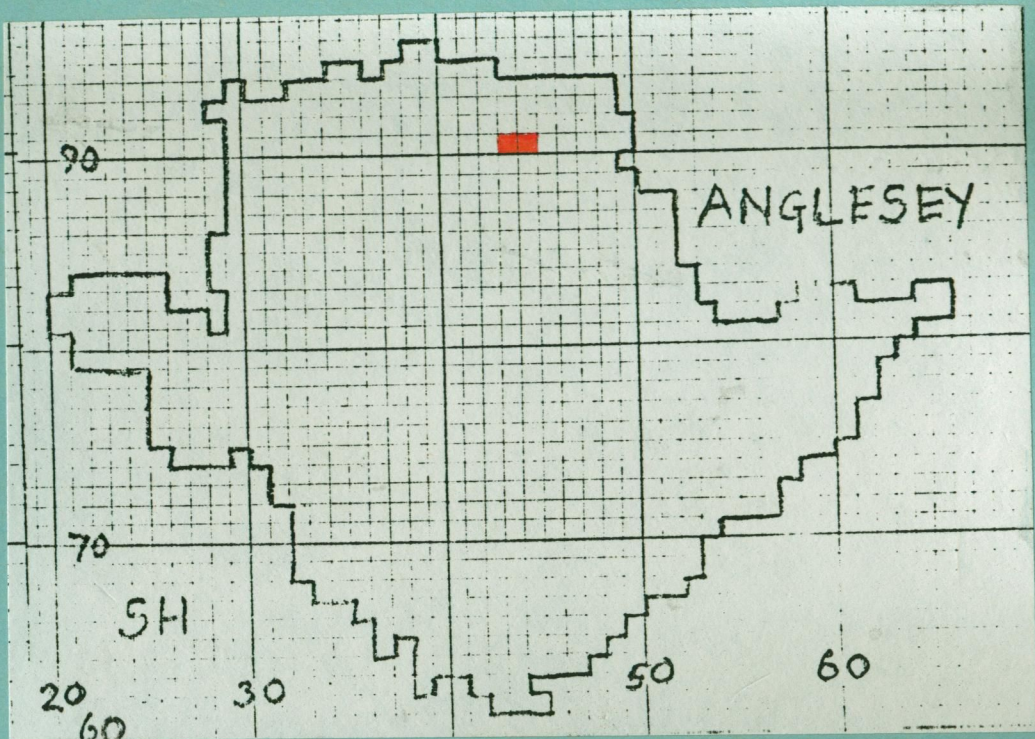
Amlwch 4392
Church Bay 2989

SULPHUR

ANG

Parys M. 4390 4490

Mona M 4390 4490



Szomolnokite

Ang.

Parys Mt.

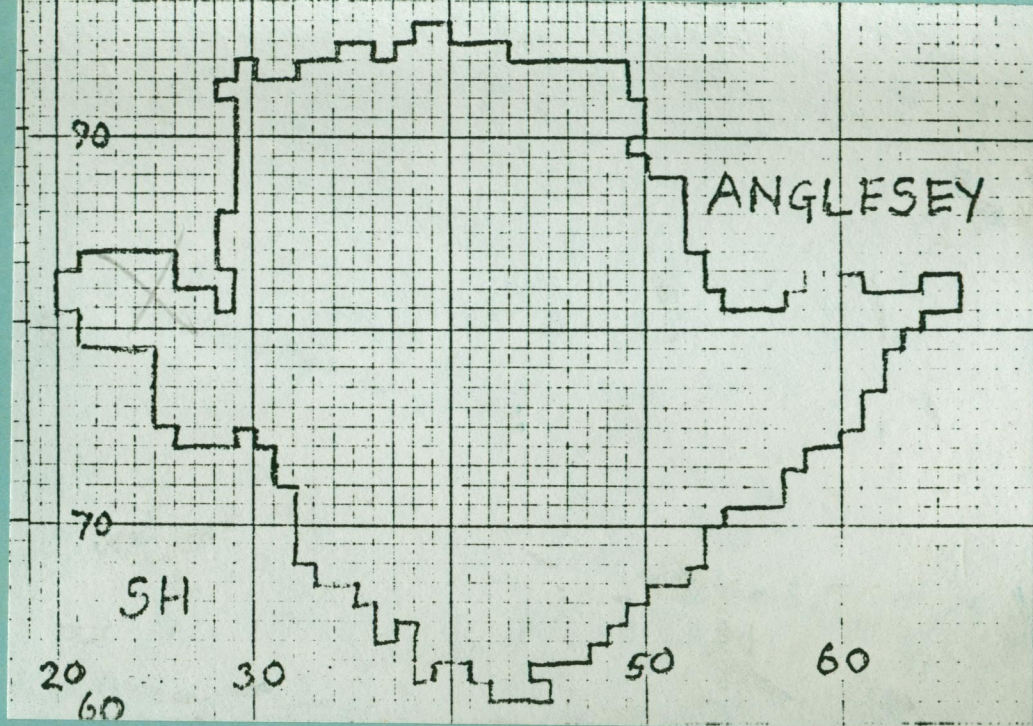
TALC

ANG

Holyhead

2

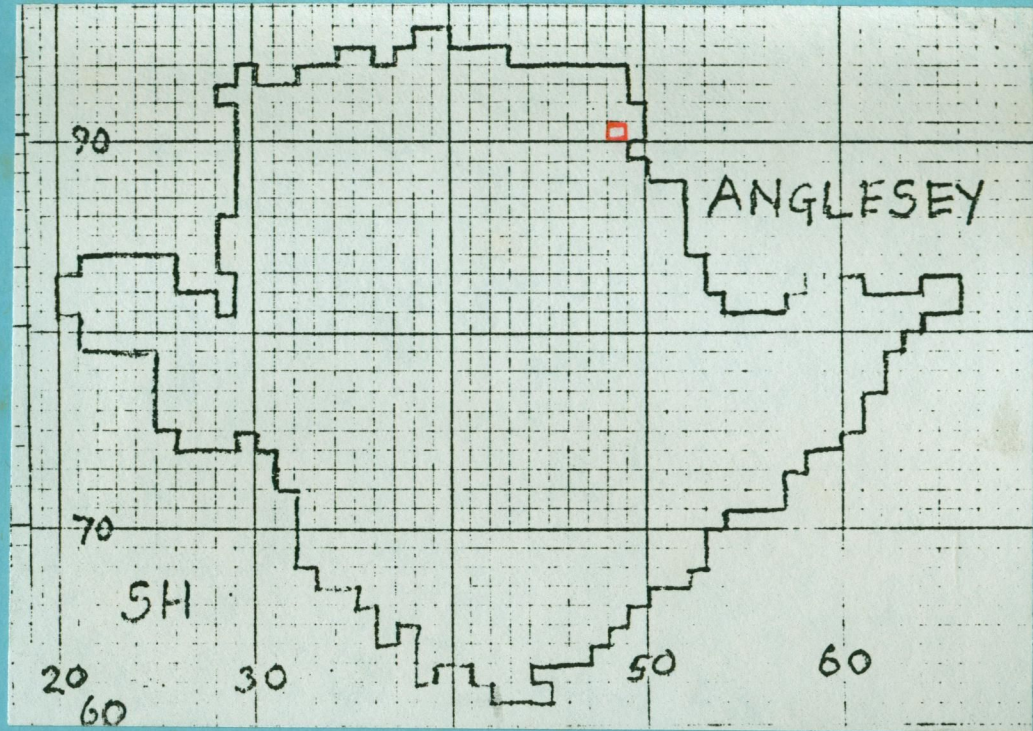
8



Tellurium

Ang

[Rhⁿos-Mynach M- in analysis (?)] 4890



Tennantite

ANG

Panys M

Tenorite, "melaconite"

ANG

Pump Mt

Tetrahedrite

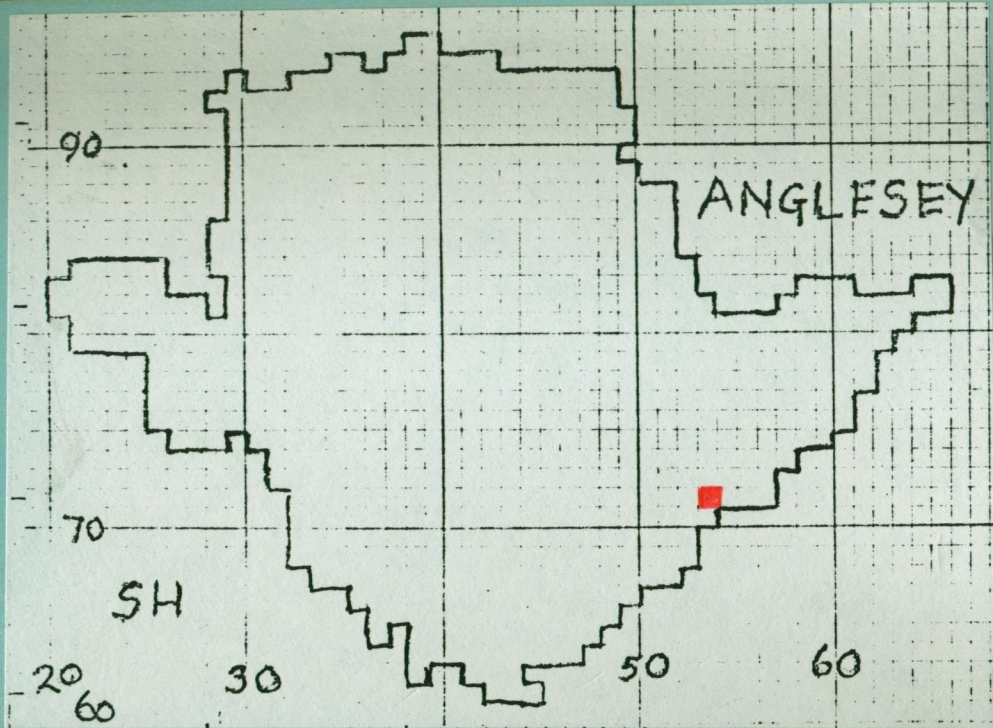
ANG

Pump ME

Titanite
(Sphere)

Ang.

Llanfairpoll ... 5371



Tremolite

Ang

Rhôscolyn 2 7

1" 106

SH 43 92

AMLWCH, Anglesey.

See also BULLOCKS QUARRY, BULL BAY cr. MYNYDD PANTY-
GASEG

TMH (1868), 72. Camb. slates. Haematite; steatite.

(A.B. Dick. MM (1888) 8, 15; (1908) 15-124.) MA 4 247

Dickite:

ABD. MM 15-124 Optically true var of "Kaolinite" at

Amlwch, Anglesey. [= dickite]
S. Clark Riv Comm' 3/7/82 Excavations at n 443 925 have small
cushions

D. Charetton, Riv. Comm (12/76) Specs → RSWB. [76-227, 228]

Dickite, vg xls (which wash off!!) from a pocket in
an old level near sea level at bottom of
a cliff near Amlwch. with dolomite xls;
chalcopyrite [longish walk from parking place] (PID)

? = BULL BAY or MYNYDD PANT-Y-GASEG?

AB Dick Min Mag (1888) 15-27 "On Kaolinite". Quotes Dr. Percy (1875) "Fuel" p 96 → between Bull Bay & Small Bay further W is PORTH-YR-HWCH, v. near which is a level at sea-level to prove a quartz lode with specks & strings of chalcopyrite, which outcrops above!

Driven ~ 83 fms, wet. Near end 2-3 short cross-levels E-W. The "kaolinite" is in one going W. The forebreast in this lev. is a blueish hard slate w. veins of quartz through it. Several small cavities in line of quartz veins, some w. x-lised "kaolinite".

D. Wilson Priv Comm 8/79 The dickite loc is Mynydd Pant-y-gaseg [qv]

BEN LLECH, Llanfair-Mathafarn-Eithaf, Ang.

J. Hyde, 6/68. Near Cromlech or Burial Chamber at SH 513 819, quartz, with purple fluorite, in slate. According to natives, also occur ca $\frac{1}{2}$ ml N of Benllech, near SH 517 837

1" 106

SH 425942

BULL BAY, Amlwch, Anglesey
See also MYNYDD PANT-Y-GASEG; AMLWCH

OS 6" map(?) shows "Copper mine (dis.)"

at W end of Bull Bay village, an
"old trial shaft" by the old windmill
 $\frac{1}{3}$ ml WNW of the village, and "old
shafts" $\frac{1}{2}$ ml further WNW, and between
Bryn-Llewelyn & Porth Cynfor (Hells Mouth),
1 ml further W.

JRF-S(1977)2. BULL BAY = RHIANFA MINE

421942. Small mine working 1863 for
copper & lead ores in "clay-slate"
with some N-S cross veins. [Min. Journ 14/3/1863]

BULLOCKS QUARRY, Amlwch, Anglesey.
See also AMLWCH

TMH (1868), 72. Serpentine.

1" 106

SM 467 88,

CAERONNEG, Llaneillian, Anglesey

See LLANEUDDOG

CAIRN'S SHAFT, Amlwch, Anglesey

See MONA M.

1" 106

SH #2992

HEAD

CARMEL ~~POINT~~, Anglesey

See also TALDRWST

TMH(1868), 72: Chalcopryte "Carmel Point"

TBB Chimney & old shafts present

D. Bates & J. Davies (1981) Geol Ass Guide ⁴⁰ "Anglesey" 12-13.
Workings on E-W fault

1" 106

SH 29 89

CHURCH BAY, Anglesey.

TMH (1868), 72: Steatite.

CARREG-Y-DDOL SHAFT, Amlwch, Anglesey

See MONA M.

1" 106

SH 228 798

COPPER MINE CREEK, Holyhead, Anglesey

See also HOLYHEAD

OS map ?

cu mine ? suggested by name

RSWB 28/8/79. Visited. Two parallel
gash-like creeks - like zawns
in blueish foliated schists. with
quartz veinings or interfoliate
lenticles. No traces of
copper minerals or mining
seen.

DYER'S SHAFT, Amlwch, Anglesey.

See PARYS M.

GADDAIR MINE

Anglesey

JRF-S(1977) 6. Loc. unk., said to be W
of Parys Mtn. Mining Journ 28/5/1838.
[Cu?]

GOLDEN VENTURE, Amluch, Anglesey.

See MONA M.

GREAT OPENCAST, Amlwch, Anglesey

See PARYS M.

GWEN ENGINE SHAFT, Amlwch, Anglesey

See PARYS M

1" 106

SH 417 90,

GWREDOG, Rhosybol, Anglesey

JRFS(1977) 5 15 fm trial shaft sunk
in 1853, exact loc. unk. 30" vein of
quartz & chalcopyrite

Min. Journ 28/5/1853

HENWAITH, Amlwch, Anglesey.

See MONA M.

HILLSIDE OPENCAST, Amlwch, Anglesey

See PARYS M.

HOLYHEAD, Anglesey

See also RHÔS COLYN, COPPER MINE CREEK

TMH (1868), 72: Camb. slates "near Holyhead";
serpentine; talc.

JRF-S (1977) 6. HOLYHEAD MINE; A
copper mine referred to in Mining
Journal 13/11/1858. No details of location
or scale. [? = COPPER MINE CREEK SH 2279]

$\frac{1}{4}$ " geol Map Serpentine over ~ 7626-28 7630 31
7726-31 7828, 29

1" 106, 115

SH38-39/62-63

LLANDDWYN ISLAND, Newborough, Anglesey

E. Greenly. G.S. Anglesey (I) p 74: Axinite,
in vein in the spilitic lavas
at the N end of Llanddwyn Is.
[cf MORFA NEFYN, Caernarvonshire]

D. Wilson Priv Comm 26/8/79 "Rhodochrosite"
veinlets common, esp. in the bay
between the lighthouse & the
tower at the SW tip of the island.

RSWB. 30/8/79 Island largely
composed of blue crossite (?)
schists highly foliated & largely
vertical in bedding. Veins of
quartz & calcite; pools and
lenticles of jasper rich in
haematite. Pink veinlets, espec.
in bay referred to above & to
SW of tower pointed out to be
"rhodochrosite" by an amateur, sampled.
→ Ca rich, Fe, ~~merest~~ traces Mn. IR = calcite.
prob w. haematite inclusions → pinkish.
SH 386 624

1"106

SH 41 83

'LLANERCHY BEDD'

Anglesey

JRF-S (1977) G. Loc. unk. Min. Journal
4/1/1862.

Merfyn Jones (2001) Riv Comm. should be
LLANERCHY MEDD.

OS gazz: LLANERCHY MEDD, SH 41 83

1" 106

SH 467 88.

LLANEUDDOG, Llaneillian, Anglesey

JRF-S(1977)5 Trial for Pb ore,
exact loc. unk., in Ordovician.

= CAERONNEG

Min. Journ 2/4/1853

LLANFAIRPWLLGWYN GYLL ...

(^{gen} Mag 5, 125-127)

N. Holgate MM 29 792 The Anglesey "glaucophane"
 = Crossite. JF Blake (1888) - blue amphibole
 in schist of the "Anglesey Column" W of the
 Menai Bridge [SH 535 716] identified as
 "glaucophane". Repeated by others, eg
 Greenley in Mem G.S. "Anglesey"
 Now from foot of crag on SE face of the
 Monument Hill on the N side of the
 Holyhead road, near Llanfairpwllgwyngyll...
 e some 1½ ml W of Menai Bridge. The blue
 amphib. is crossite, assoc. with, in rock,

epidote, sphene, quartz, albite, a
chlorite, spongy haematite.

1" 106

SH

39 69

LLANGADWALADRAnglesey

F. Smithson & G. Brown MM 31 381 . On Bodorgan
shore Anglesey, ca 1500 yd SW of the bridge,
(Pont Malldraeth) [ie ca SH 397 677], very
coarse Millst. grit speckled white with
dickite & brown with "limonitic matter"

11/06

SH 4987, 5087, 5187

LLIGWY BAY,

Anglesey

Ken D. Savage (via JIW & Jon) spec → RSUB for ident.
(8/97). From Lligwy Bay, Anglesey, grid
Ref given = "513 872" [in the sea!].

Sideronatrite (FTIR, 9/97), pale brownish-
yellow spherules ~ 0.1 mm with thin
crusty gypsum on dark matrix,
smelling of SO_2 [pyritic shale decomp.?].
[gypsum] ident supported by XRD of poor
sample (mixture!)]

LLIGWY

Lligwy lies on the east side of Anglesey and the southern end of the bay marks the junction between the Traeth Lligwy formation of Devonian age and the Lower Carboniferous.

"NGR 513 872"

The Lower Carboniferous has been assigned to the upper two stages of the British Dinantian, the Aspian and the Brigantian.

The limestone strata of this age is often in cyclothems and these are well seen in Anglesey.

The junction between the Devonian and Carboniferous is masked by wind-blown sands and at one time, the Lligwy Bay Conglomerate was thought to represent the base of the Carboniferous. It is now known that this rests on a lower limestone bed and the true junction must be hidden in the sands.

The Conglomerate is poorly sorted with angular blocks of dolomitised limestone. It is seen at the location called Careg Ddafad.

of Greenly

Above these beds is the famous Lligwy Bay disturbance. A series of limestone beds dip deeply to the north-east and appear to lie on sandstones. It has been suggested that this is a collapse feature.

Beyond the disturbance sandstones and shales occur which are overlain by limestones which represent the first cyclothem of the section.

1" 106

SH 448 913

LLYN-COCH TRIAL, Amlwch, Anglesey

JRF-S (1977) 4 Unsucc. trial for Cu
to prove E extension of PARYS-MONA
system

S. Clark, Riv. Comm 3/7/82. Could not find
it.

1" 107, 106

SH 55 71

MENAI BRIDGE, Llandysilio Anglesey

BM: Rhodonite, mass. with psilomelane

MONA MINE, Amlwch, Anglesey (I)
 See also PARYS M, MORFA DDU etc

TMH (1868), 72. (Cu). Anglesite; chalcopyrite

Davies (1888) p 139, 141. Adjacent, to E, to PARYS MINE;
 "recent discovery of ore under the old workings
 is likely to restore this mine to its
 old prosperity." The mine is an E-ward
 continuation of NORTH DISCOVERY LODE

WJL (1967) Map, facing p 237. Lead mine

R. Warner, 2nd Walk (1800) p. 284-295 ^{Descrip.} 1 MONA M, p 288
 Mineral list [presum. for MONA + PARYS MINES]:-

yellow sulphurated copper ore [chalcopyrite];
native copper, rarely; sulphate of copper
both crystallised & in solution [chalcantite;
poss. error for pisanite]; sulphate of lead
[anglesite] with a consid. prop'n of silver;
black ore (copper + galena + calamine + a little
silver); native sulphur. Mr. A. Atken,
in "A Journal of a Tour Through N. Wales", mentions
malachite or green & blue [sic] carbonate of
copper, but I am told (by local experts) that
malachite is never found, & the black ore
rarely. ["Black ore" ? = bluestone ore]

GOLDEN VENTURE 444904 ADIT PORTAL 438913
JQFS (1977) 3-4. "Bluestone" (gal sphal py Cupy. CAIRN'S SH.
CARRIG-Y-DDOL SH., TIDDY'S SH., PEARL'S SH. HENWAITH 451907

MONA MINE, Amlwch, Anglesey (II)

Plant, Cotterell & Starkey (2011) Min. Rec. 42, 345-383
"Anglesite from the type loc. Parys Mt, Ang., Wales"

Detailed account; History, geol, min, photos,
etc. Recent finds of excellent typical

anglesites from a dump in the MONA
section

Listed (all MONA &/or PARYS-?)

Acanthite (1μ inclusion in anglesite) [Mona or Parys?]
allophane, antlerite, arag, barite, bendanite,
brochant, calcite, chalcant, copiapite, cel,
coquimbite, fersobanyait, goethite, gypsum,
~~garn~~ halotrichite (NOT pickeringite), jarosite,
hydronium jaros, malachite, melanterite
("pisanite")

phosgerite (thin layer on relict galena),
romerite, rancieite, sulphur, szomolnok.
Bismuth gold silver arsenopyrite
bismuthinite chalcocite chalcopyr,
covell, galenobismatite jordanite
kobellite

See separate card sheaf mineral list

Plant et al (2011)

MONA (42)

Table 1. Mineral species previously reported from

Elements

Bismuth
Copper
Gold
Silver
Sulfur

Bi
Cu
Au
Ag
S

Parys ME(i.e. PARYS
+ MONA Ms)**Sulfides and Sulfosalts**

Acanthite*
Arsenopyrite
Bismuthinite
Bornite
Bournonite
Chalcocite
Chalcopyrite
Covellite
Galena
Galenobismutite
Jordanite
Kobellite
Marcasite
Pyrite
Pyrrhotite
Sphalerite
Spionkopite
Tennantite
Tetrahedrite

Ag₂S
FeAsS
Bi₂S₃
Cu₅FeS₄
PbCuSbS₃
Cu₂S
CuFeS₂
CuS
PbS
PbBi₂S₄
Pb₁₄As₆S₂₃
Cu₂Pb₁₀(Bi,Sb)₁₆S₃₅
FeS₂
FeS₂
Fe_{1-x}S
ZnS
Cu₃₉S₂₈
Cu₆Cu₄(Fe,Zn)₂(As,Sb)₄S₁₃
Cu₆Cu₄(Fe,Zn)₂(Sb,As)₄S₁₃

Oxides, Hydroxides

Anatase	TiO_2
Cuprite	Cu_2O
Goethite	$\alpha\text{-Fe}^{3+}\text{O(OH)}$
Hematite	Fe_2O_3
Ilmenite	$\text{Fe}^{2+}\text{TiO}_3$
<i>Limonite</i>	
Magnetite	$\text{Fe}^{2+}\text{Fe}_2^{3+}\text{O}_4$
Minium	$\text{Pb}_2^{2+}\text{Pb}^{4+}\text{O}_4$
Ranciéite	$(\text{Ca}, \text{Mn}^{2+})\text{Mn}_4^{4+}\text{O}_9 \cdot 3\text{H}_2\text{O}$
Rutile	TiO_2
Tenorite (melaconite in Greenly)	Cu^{2+}O

Halides

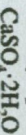
Phosgenite*	$\text{Pb}_2(\text{CO}_3)\text{Cl}_2$
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* species discovered during the present study.
Those minerals in *italics* are considered dubious.

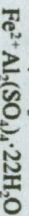
Gunningite



Gypsum



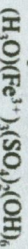
Halotrichite



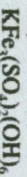
Hydro-glockerite

= Lepidocrosite

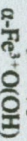
Hydroniumjarosite



Jarosite



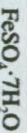
Lepidocrocite



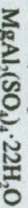
Pisanite

= Melanterite

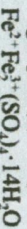
Melanterite



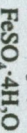
Pickeringite



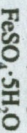
Römerite?



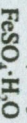
Rozenite



Siderotil

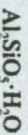


Szomolnokite



Silicates

Allophane



"Asbestos"

Chlorite group

Quartz



"White mica"

Parys Mountain, or identified during the current study.

Carbonates

Ankerite	$\text{Ca}(\text{Fe}^{2+}, \text{Mg}, \text{Mn})(\text{CO}_3)_2$
Aragonite	CaCO_3
Azurite	$\text{Cu}_3^{2+}(\text{CO}_3)_2(\text{OH})_2$
Calcite	CaCO_3
Dolomite	$\text{CaMg}(\text{CO}_3)_2$
Felsőbányaite	$\text{Al}_4\text{SO}_4(\text{OH})_{10} \cdot 4\text{H}_2\text{O}$
Malachite	$\text{Cu}_2^{2+}(\text{CO}_3)(\text{OH})_2$
Siderite	FeCO_3

Phosphates

Pyromorphite?	$\text{Pb}_5(\text{PO}_4)_3\text{Cl}$
---------------	---------------------------------------

Sulfates

Alum group

Alunogen	$\text{Al}_2(\text{SO}_4)_3 \cdot 17\text{H}_2\text{O}$
Anglesite (TL)	PbSO_4
Anhydrite	CaSO_4
Antlerite	$\text{Cu}_3^{2+}(\text{SO}_4)(\text{OH})_4$
Barite	BaSO_4
Beudantite*	$\text{PbFe}_3[(\text{As}, \text{S})\text{O}_4]_2(\text{OH}, \text{H}_2\text{O})_6$
Brochantite	$\text{Cu}_4^{2+}(\text{SO}_4)(\text{OH})_6$
Chalcanthite	$\text{Cu}^{2+}\text{SO}_4 \cdot 5\text{H}_2\text{O}$
Copiapite	$\text{Fe}^{2+}\text{Fe}_4^{3+}(\text{SO}_4)_6(\text{OH})_2 \cdot 20\text{H}_2\text{O}$
Coquimbite	$\text{Fe}_2^{3+}(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$
Fibroferrite	$\text{Fe}^{3+}(\text{SO}_4)(\text{OH}) \cdot 5\text{H}_2\text{O}$

MORFA DDU, Amlwch, Anglesey.

See also PARYS, MONA etc M's

Davies (1888), 143, 246. 1 ml W of PARYS MINE continuation
(?) of lode through GREAT OPEN CAST at Parys Mine
forms peculiar ore ("bluestone"). Pb, 16%;
Zn, 32%; Cu, 2%; Ag, 7oz/ton; S, Fe, Sb, Mn, small qts.

FJN (1962), 61, 20 Main ore = "bluestone" a mixt of
blend of galena with chalcocite

WJL (1967) Map, facing p 237. Lead mine

JRFS (1977) 2 MORFA-DU W end of Parys orebodies.
"Bluestone" (= "BPG" gal, sphal, py, cupy) impregs

along EW fissures - ill defined, not true veins.

Active 1881-1904

Smith & Dewey SRMRGB 23 (1922) 81-85

Smith & Carruthers ~~SRMRGB~~ SRMRGB 30 (1925) 33, 35.

W Manning in N-F (1959) 319

JM Thomas "The mineral wealth of Wales & its Exploit'n" (1961) 201, 214-8.

MYNYDD PANT-Y-GASEG, Amlwch, Anglesey.

See also BULL BAY; AMLWCH

JRF-S(1977) Trial shaft for copper ore, in
Pre-Cambrian. [M.J. 14 March 1863]

D Wilson. Priv Comm 8/79 The dickite loc.,
in a level well above sea level
occurs in other levels as
well, but less good. [See AMLWCH.
Quartz, chalcopyrite, dolomite]

Min. Rec. (1988) 19 337 Dickite xls
on quartz - "PANT-Y-GASEG"

1" 106

SH 378 948

OGOF GYNFOR, Llanbadrig Anglesey

Baker & Davies (1981) Anglesey, Geol Ass Guide 40, 15
~350 m E of Llanbadrig is Ogof Gynfor, folded
& faulted Ordov. exposure; mineralised &
worked for Cu ores.

PANT-Y-GASEG, Trwynbychan, Anglesey
see MYNYDD PANT-Y-GASEG

Min. Rec (1988) 12 337 "N. Hubbard has... excellent
micro clckite xls on quartz xls from Pant-y-
Gaseg.

PARYS MINE, Amlwch, Anglesey (I)

See also MONA M., MŌRFA DDU

TMH(1868), 72. (Cu). Anglesite; chalcanthite; copper; cuprite; malachite; melanterite; minium; pyrite; serpentine; silver; sulphur; chalcoppyrite; yellow-ochre.

Davies (1888) 138 ff: V. import. Cu mine worked ca. 1 century & a quarter. There had been traces of older mines & furnaces. After semi-successful working, v.g. ore found near surface, & worked with great profit since.

Mine is described in great detail with three sections. See card (II).

Adjacent mine to E is MONA.

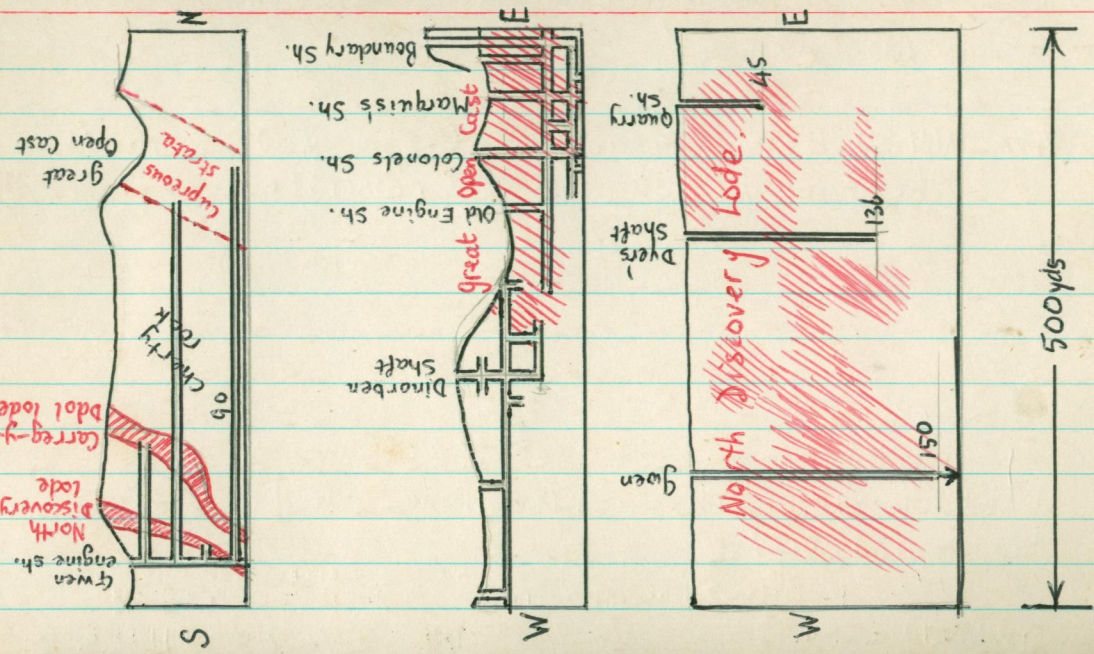
One also at MORFA DDU, to W.

The one in NORTH DISCOVERY LODE is nests of earthy black ore near surface, passing into yellow pyrites in depth; rarely some native copper; throughout there are numerous cavities lined with crystals of copper [pyrites] and sulphate of lead.

RSWB, TBG, III, 39-40 (2/3/63) Not much of ~~the~~ mineralogical interest. Vast pit. Pyrite; pisanite. Chalcopysite & copper stains on dumps on N slope of hill.

FJN (1962) 60-65 Details; history. Chalcopysite, pyrite, blende, galena. "Bluestone ore" = blende + gal + cupy

PARYS MINE, Amlwch. Anglesey (II)



MA 1 328 Hydroglockente (Brown. Sol in
water & CS₂)

L. Bor, MM 29 63 Pisanite, also a few minute
chestnut-brown xls - ? römertite.

R. Warner, 2nd Walk (1800) 284-295. Mineral list (see MONA M)
- chalcopyrite; native copper; anglesite; native sulphur;
* Copper sulphate, "xl'd & in soln"
[? chalcantite - ? error for pisanite]; black ore
Told that malachite does not occur.

["Black ore" prob. = "bluestone ore"]

Descrip.
JRF-S (1977) 3-4. "Bluestone" GT OPENCAST 440902
HILLSIDE OPENCAST 442903
GWEN ENG. SH. 437905. ~~ADH PORTAL~~ DYER'S SHAFT.

PARYS MINE, Amlwch, Anglesey (III)

Smith & Dewey, SRMRGB 23 (1922) 81-85

Smith & Carruthers, SRMRGB 30 (1925) 32-38

WManning in N-F (1959) 313-333 (+ bibliog.)

TM Thomas (1961) 214-218

S. Clark, Priv Comm 3/7/82 Dumps at
roadside at 438 908 v opp. track to
Parys Fm v. coppery - many lumps of
chalcopysite on digging, little pyrite.
S with peculiar rusty crust - brilliant inside.

Bevins & Sharpe (1982) NMW 60.250.GR2.

Azurite w. malachite "Parys Mountain"

A. Neale Riv Comm 1992. Spec's → Rsub,

checked by FTIR: Melanterite; good
halotrichite; copiapite, pale brown
granular.

M. Southwood & R. Bevins (1995) UKJMM. ~~History of~~
~~anglosite~~ collection 15 11-17 "Parys Mt:
the type loc. for anglosite". Nat Bi Cu,
Au, Ag, S. Anatase, cuprite, goeth, haem, ilmén,
magnet, minium, qtz, rutile, tenor, Bismuthinite,
born, bournon, chalcoc, covell, gal, gal-bismutite,
jordan, kobell, marcas, pyrite, pyrrhot, sphal, spionkop,
tennant, tethed, anker, dolom → Back of (IV)

PARYS MINE,

RSN(1992) 23

Parys Mountain, Anglesey, and Manod
Quarry, Blaenau Ffestiniog
23-24th May 1992

Our leader, Malcolm Southwood, briefly summarised the geology and mineralogy of the Parys Mountain ore deposit. Examination of the dumps near Morris's Shaft revealed massive sulphide ore material, and some good quartz crystals were seen within the 'white rock' outcrop.

After lunch the party descended into the Great Opencast and again, sulphide ores were found *in situ* along with well crystallised chalcantithite.

The following day sulphide ore samples were collected from the New Prospect dumps.

BMSN(2004)68 p 30

Amwlch, Anglesey (IV)

RSN(1999)35, 15-16. Included

an und'g'd trip.

All open sh's inclines capped in 1980, but Parys Incline sh. opened 1995 → 11.5 km of wk'gs on 10, 16 & 20 fm levels; poss. to water table in 25 fm. lvs.

Melanterite var "pisanite" in "pisanite chamber" on 16 fm W. w cupy-py veins - "antlerite"

xs were also locally abundant". White seams basaluminite in "quarry stope". Rusty gyps. flowers
PTO

Stone hammers ("maeds") have been found in old workings. — ^{14}C of org debris assoc $\rightarrow$ 3000-3600 yrs.
Surface — "pisarite", jarosite, "ruby" sphal.
A pile of black crucible slag with fine filament metal. copper & amorphous blues & greens. Dumps gave galena, ch'pyrite.

(Southwood & Brings '95 cont'd) malach, siderite,
angles, anhyd, barite, chalcant, gyps,
pyrom. Post-mining: copiap, halotrich,
jaros, melanter, pickering.

PARYS MINE, Amwlch, Anglesey (V)

Jenkins ~~Wen~~ et al (2000). See J. Russ
Soc (2005) 8 [2] 81-84 (Antlerite)

Plant, Colterell & Starkey (2011) Min. Rec. 42, 345-383
"Anglesite from the type loc, Parys Mt., Ang., Wales"
Detailed history, geol, min, photos, references etc.
Mineral list on separate card sheaf

Table 1. Mineral species previously reported from

Parys Mt

(= PARYS +
MONA mine)

Elements

Bismuth
Copper
Gold
Silver
Sulfur

Bi
Cu
Au
Ag
S

Sulfides and Sulfosalts

Acanthite*
Arsenopyrite
Bismuthinite
Bornite
Bournonite
Chalcocite
Chalcopyrite
Covellite
Galena
Galenobismutite
Jordanite
Kobellite
Marcasite
Pyrite
Pyrrhotite
Sphalerite
Spionkopite
Tennantite
Tetrahedrite

Ag_2S
 FeAsS
 Bi_2S_3
 Cu_5FeS_4
 PbCuSbS_3
 Cu_2S
 CuFeS_2
 CuS
 PbS
 PbBi_2S_4
 $\text{Pb}_{14}\text{As}_6\text{S}_{23}$
 $\text{Cu}_2\text{Pb}_{10}(\text{Bi},\text{Sb})_{16}\text{S}_{35}$
 FeS_2
 FeS_2
 Fe_{1-x}S
 ZnS
 $\text{Cu}_{39}\text{S}_{28}$
 $\text{Cu}_6\text{Cu}_4(\text{Fe},\text{Zn})_2(\text{As},\text{Sb})_4\text{S}_{13}$
 $\text{Cu}_6\text{Cu}_4(\text{Fe},\text{Zn})_2(\text{Sb},\text{As})_4\text{S}_{13}$

Plant et al (2011)

PARYS (V2)

Oxides, Hydroxides

Anatase	TiO_2
Cuprite	Cu_2O
Goethite	$\alpha\text{-Fe}^{3+}\text{O}(\text{OH})$
Hematite	Fe_2O_3
Ilmenite	$\text{Fe}^{2+}\text{TiO}_3$
<i>Limonite</i>	
Magnetite	$\text{Fe}^{2+}\text{Fe}_2^{3+}\text{O}_4$
Minium	$\text{Pb}_2^{2+}\text{Pb}^{4+}\text{O}_4$
Ranciéite	$(\text{Ca}, \text{Mn}^{2+})\text{Mn}_4^{4+}\text{O}_9 \cdot 3\text{H}_2\text{O}$
Rutile	TiO_2
Tenorite (melaconite in Greenly)	Cu^{2+}O

Halides

Phosgenite*	$\text{Pb}_2(\text{CO}_3)\text{Cl}_2$
-------------	---------------------------------------

* species discovered during the present study.
Those minerals in *italics* are considered dubious.

Parys Mountain, or identified during the current study.

Carbonates

Ankerite	$\text{Ca}(\text{Fe}^{2+}, \text{Mg}, \text{Mn})(\text{CO}_3)_2$
Aragonite	CaCO_3
Azurite	$\text{Cu}_3^{2+}(\text{CO}_3)_2(\text{OH})_2$
Calcite	CaCO_3
Dolomite	$\text{CaMg}(\text{CO}_3)_2$
Felsőbányaite	$\text{Al}_4\text{SO}_4(\text{OH})_{10} \cdot 4\text{H}_2\text{O}$
Malachite	$\text{Cu}_2^{2+}(\text{CO}_3)(\text{OH})_2$
Siderite	FeCO_3

Phosphates

<i>Pyromorphite?</i>	$\text{Pb}_3(\text{PO}_4)_3\text{Cl}$
----------------------	---------------------------------------

Sulfates

<i>Alum group</i>	
<i>Alunogen</i>	$\text{Al}_2(\text{SO}_4)_3 \cdot 17\text{H}_2\text{O}$
Anglesite (TL)	PbSO_4
Anhydrite	CaSO_4
Antlerite	$\text{Cu}_3^{2+}(\text{SO}_4)(\text{OH})_4$
Barite	BaSO_4
Beudantite*	$\text{PbFe}_3[(\text{As}, \text{S})\text{O}_4]_2(\text{OH}, \text{H}_2\text{O})_6$
Brochantite	$\text{Cu}_4^{2+}(\text{SO}_4)(\text{OH})_6$
Chalcanthite	$\text{Cu}^{2+}\text{SO}_4 \cdot 5\text{H}_2\text{O}$
Copiapite	$\text{Fe}^{2+}\text{Fe}_4^{3+}(\text{SO}_4)_6(\text{OH})_2 \cdot 20\text{H}_2\text{O}$
Coquimbite	$\text{Fe}_2^{3+}(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$
Fibroferrite	$\text{Fe}^{3+}(\text{SO}_4)(\text{OH}) \cdot 5\text{H}_2\text{O}$

Gunningite
 Gypsum
 Halotrichite
Hydro-glockerite
 Hydroniumjarosite
 Jarosite
Lepidocrocite
 Pisanite
 Melanterite
Pickeringite
 Römerite?
 Rozenite
 Siderotil
 Szomolnokite

Silicates

Allophane
 "Asbestos"
Chlorite group
 Quartz
 "White mica"

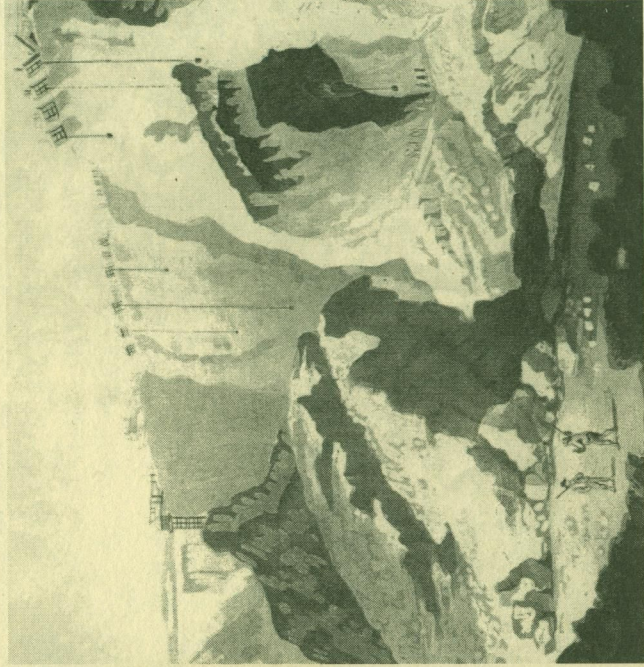
$\text{ZnSO}_4 \cdot \text{H}_2\text{O}$
 $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 $\text{Fe}^{2+} \text{Al}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O}$
 = Lepidocrosite
 $(\text{H}_3\text{O})(\text{Fe}^{3+})_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{KFe}_3(\text{SO}_4)_2(\text{OH})_6$
 $\alpha\text{-Fe}^{3+}\text{O}(\text{OH})$
 = Melanterite
 $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
 $\text{MgAl}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O}$
 $\text{Fe}^{2+} \text{Fe}_2^{3+}(\text{SO}_4)_4 \cdot 14\text{H}_2\text{O}$
 $\text{FeSO}_4 \cdot 4\text{H}_2\text{O}$
 $\text{FeSO}_4 \cdot 5\text{H}_2\text{O}$
 $\text{FeSO}_4 \cdot \text{H}_2\text{O}$

$\text{Al}_2\text{SiO}_5 \cdot \text{H}_2\text{O}$

SiO_2

Parys Mountain Copper Mines

Amlwch, Anglesey



Industrial Heritage Trails



PARYS MOUNTAIN COPPER MINES

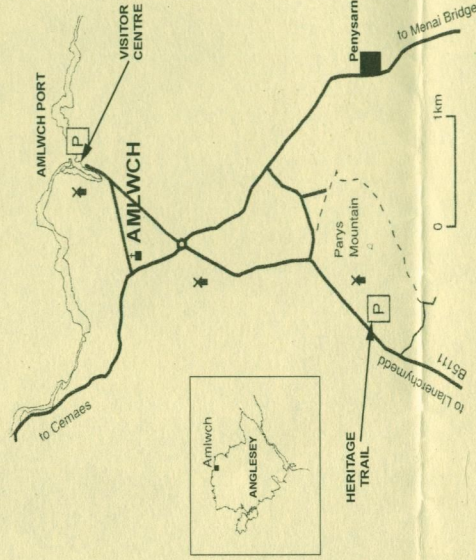
Take a walk around what was in the 18th century, the greatest copper mine in the world.

View the dramatic chasm of the Great Opencast with its multicoloured rocks and acid lake, from the new viewing platform.

See the extensive precipitation ponds where scrap iron was turned into copper.

Visit the remains of one of the oldest Cornish Engine Houses still existing in Britain.

Learn about Thomas Williams, "The Copper King" who was a leading figure of the Industrial Revolution.



AMLWCH PORT

Visit the small, picturesque port of Amlwch, described in its heyday as being the most important in Wales.

See the remains of the original 19th century shipyards where many well known sailing vessels were built.

Visit the Trust's interesting mining and maritime exhibition and relax in the coffee shop.

Enquire about walks guided by members of the Amlwch Industrial Heritage Trust

Tel: 01407 832255

Open: 10.30am until 5.00pm

1"106

SH

SOUTH ~~PARYS~~ COPPER MINING CO. LTD.

Anglesey

JRF-S (1977) 6. Advert in Min. Journ. 24/6/1863
~~The~~ Loc. of workings unknown.

PEARL'S SHAFT, Anluch, Anglesey

See MONA M.

1" 106

SH 47 72

PENTRE - BERW

Anglesey.

OS 1" map shows Colliery (dis) $\frac{1}{2}$ ml
W of Holland Arms Station. coal

PORTH HELYGEN

Anglesey

See PORTH-YR-ABER

OS 6" map

shows "Copper mine (dis.)"

on coast immediately S of Porth
Helygen.

1" 106

SH 48 90

PORTH-YR-ABER TRIAL, Llancuillian, Anglesey.

See also PORTH HELYGEN

JRFS(1977)5 Trial for cuore

RHIANFA MINE, Amlwch, Anglesey

See BULL BAY

RHÔSCOLYN, Holyhead, Anglesey.

TMH(1868), 72. Limes. & Trap. Asbestos ("Amianthus")

D. R. Lemin, Priv Comm (12/74) White fibrous
chrysotile (IR, RSWB) + calcite (IR, RSWB); mid to
 dark green fibrous to platy antigorite
 (IR, RSWB) with inclusions of magnetite
 exposed at 276 772. At 268 772
 small roadside quarry with excellent
 platy-massive dark green antigorite,
 translucent. (IR, RSWB). Magnetite x/s
 exposed in bay near 27x 750.

Tony Ellis 6/75 Riv Comm. Magnetite xls

in a chlorite-schist, & with talc
schist in small quarry ca $\frac{1}{2}$ ml N
of Bron-del farm.

Some magnetite
xls have cores of chalcopyrite.

Enstatite-pyroxenite, serpentinised, with
enstatite plates to 6" (1) on an
island ^{ca branch of} in the estuary between Anglesey
& Holy Is., and (2) on nearby mainland,
with tremolite also.

H. Winstanley, 7/75 Riv Comm. The magnetite loc
is a trial with a small slope, on a small
craggy outcrop at 266 765, in a field with
a concrete hut. Best stuff at top mined
out - but material ~~in~~ in floor to be got?

1" 106 SH 47 91
Llaneillian 483 905
RHÔS-MYNACH MINE, Amlwch, Anglesey.

RSWB, TBG, III, 41 (2/3/63) 2ml ESE of Amlwch. Dumps
like those of Parys mine (qv). open flooded
shaft.

D Charlton, Priv. Comm. (12/76). According to
"a report", analysis of a sample showed
Au, Ag, Te, Bi etc. Chalcopryrite
blende, galena, quartz.

Smith & Caruthers SRMRGB 30 38-39

JRF-9(1977)5 SH 483905. Cu mine in
black Silurian shales w. felsite dykes.
3 "veins" - much quartz, w. chalcopyrite,
other Cu minerals & much pyrite
Active 1917-1925 - reaching 100 ft below adit.

^APhillips & ^JDarlington. Records of Mining & Metallurgy (1857)
p 269. Pub. E & F.N. Spon.

1" 106

SH 296 927

TALDRWS(T), Llanfairyrghornwy, Anglesey

See also CARMEL HEAD.

JRF-3(1977)2 Small mine or trial for
Copper ore. Vein in line with Carmel
Head Thrust.

TIDDY'S SHAFT, Amlwch, Anglesey

See MONA M.

1" 106

SH 46.2 911

TYDDYN-ENGAN, Llaneillian, Anglesey

JRF-S(1977) 4. Unsucc. trial for E
extension of PARYS-MONA [Cu] deposits.

W Manning in N-F (1959) 313-333- see Discussion

S. Clark, Priv. Comm. 3/7/82. Could not
find it.

[^]
Tŷ-FRY, Pentraeth, Anglesey

D. Wilson, Priv. Comm. 26/8/79. In
the schists of the area, e.g.
on Tŷ-Fry farm, ~~reinterbedded~~
rhodochrosite. [?] [e.f. Llanddwyn
Island] [prob. = calcite]

1" 106

SH 483 924

TYLLAU DUON, Llaneillian, Anglesey

JRF-S(1977)5

on S side of

Trail for Cee & Ph ones,
Carmel Head Thrust.