Networks of Metalliferous Mining Migration in the Nineteenth Century Transatlantic World: The Cornish and Irish – a Comparative Study

Migration has been an important feature of European history for centuries. However, we still know relatively little in detail about migration in the past. Baines (1994) considered that one of the key questions that needed to be addressed was the relative incidence of migration in the past: why did people migrate from some communities and not others? Observers of contemporary migration such as Faist (2000) have also isolated the relative incidence of migration as one of the factors problematizing international migration analyses: 'Why are there so few migrants from so many places and so many from only a few places?'

Yet, there are still few investigations that examine the details of past migrations from the British Isles, who the migrants were, the type of communities they came from and what kinship and recruitment networks supported their migration decisions. In order to address these concerns, migration research needs to move away from a purely qualitative approach to encompass quantitative analyses. However, quantitative research that enables partial life-course reconstitution or longitudinal analyses has been impossible until relatively recently with access to large computerised databases of nineteenth century census returns and other rites of life data available online.

The Cornish and the Irish were among the most mobile of ethnic groups in nineteenth century western Europe and some of this movement was accounted for by the migration of hard rock miners. Cornwall is renowned for its mining migration, which has been well documented by Rowe (1974), Payton (1999) Schwartz (2005), but as Cowman (1983) has pointed out, school geography text books of a generation ago 'assured us that there had been no mining in Ireland'. It is no surprise then that the migration of miners from Ireland has received rather less attention. The significance of emigration streams of Irish miners to metalliferous mining centres in Britain and the US has been overlooked in mainstream literature that has focused largely on Irish immigration to the urban centres (Burchall 1979; Belchem 1990; Davis 1991), exceptions are Emmons (1989) whose work focussed on the Irish in Butte Montana; MacRaild (1998) who looked at the Irish in Cumbria and Mulligan (2001) who has analysed Irish migration to Michigan.

Additionally, the dominant discourse of post-famine Irish migration to Britain and the US is that of destitute, unskilled, often diseased people with few prospects of social and economic advancement, a movement of non- or semi-skilled opportunists. Yet Ireland was an important centre of nineteenth century hard rock mining as field and archival research by the Mining Heritage Trust of Ireland has demonstrated.

One of the factors problematizing the study of Irish migration networks is the absence of census data. In its place, the Griffith Valuation and other records have been used to attempt to determine where people came from in Ireland using the origin and ramification of family names as a means to determine geographical patterns that point to places of origin for certain surnames (MacLysaght, 1985). Current work on Cornish and Irish migration within Britain and the US has focussed on surname distribution (for example see Lloyd, Webber and Longley, CASA, UCL and the ESRC—funded *Application of Isonymic Analysis to Historical Data: Irish Migration to Britain, 1851-1901*, Smith, MacRaild *et al*), but while this highlights the spatial distribution over time of surnames that are relatively unique to both Cornwall and Ireland, such a macro-approach does not sufficiently explore the dynamics of migration networks: how did they come into being, why were they localised and how were they sustained across time and space leading to often distinct settlement patterns? Moreover, as Kenny argues in his 1998 work on Irish immigration to the anthracite region of Pennsylvania, 'surname analysis, on its own, cannot produce scientifically reliable data and is only of use if it supplements a pattern verified elsewhere'.

OBJECTIVES

There has been no comparative research of Cornish and Irish hard rock mining migration and this project wanted to explore similarities and differences in migration networks of Irish and Cornish miners. We wanted to see if it was possible to link internal and external migration flows, for migration within the boundaries of the nation-state and emigration outside those boundaries have usually been treated separately and comparisons across international borders and internal migrations are therefore rare. We also wanted to move beyond previous research on surname recognition. This has identified certain patterns of skill migration from Cornwall/Ireland within Britain and to centres in the USA. With a micro-study of specific names and families, a fine mesh analysis of the networks and process of migration could be reconstructed, an approach called for by Baines back in 1994. The principal working hypothesis was that many of the migration streams from Cornwall and Ireland were skill-based and localised.

For the purposes of our pilot study, we employed four case studies that spanned the nineteenth century and took in four important hard rock mining areas in Britain, Ireland and the US. We extracted a cohort of Irish and Cornish miners from each of the following records: 1) the 1870 Census for Keweenaw, Michigan (Eagle Harbour and Copper Falls; 2) the 1881 Census for Cumbria (Roose and Cleator Moor; 3) the 1861 Census for Cornwall; and 4) the July 1842- June 1844 Mine Cost Book from Allihies (West Cork). The intention was to nominally link mineworkers from Cornwall and West Cork using computer-assisted manual linkage methods to look for migration patterns and networks.

It must be emphasised that we only set out to test the feasibility of a quantitative approach in this pilot project and we would stress that relationships between mobility and other variables that are indicated by quantitative data will need to be supplemented by qualitative data that provide more evidence for the reason for the migration flows rather than their context.

PRELIMINARY ANALYSES

The Allihies Cost Book: has the objective of extracting the data been met?

Allihies (*Na hAilichí*, formerly known as Cluin) is situated above Ballydonegan Bay on the western end of the Béara Peninsula between Cod's Head and Dursey Head in the west of County Cork. This area is highly mineralized, and is the site of the Berehaven copper mines worked from 1812-1884. With a recorded output of 0.3 million tons with an average grade of 10% (30,000 tons of copper metal), this was one of the most productive mines in the British Isles (Barnes 2004). Yet beyond specialist mining journals, very little has been written about the mining industry of Béara (an exception is Williams 1991) and migration from this area (see Mulligan 2001 who analyzed Irish migration to Michigan). Using surname ramification, he determined that many of the Irish names in the Keweenaw are likely to be of West Cork derivation, but he had no access to the mine Cost Books). The Berehaven copper mines centred on Allihies represent one of the most industrialized parts of nineteenth century Ireland and therefore make an excellent case study.

Several Cost Books (ledgers used to record the financial expenditure of the mining company) that had been discovered in an attic in Wales were returned to Béara but were largely unknown outside the community. These Cost Books include the names of those salaried men and women who worked on the mine in various capacities (from surface workers, blacksmiths and hauliers, to those who laboured underground). We were granted access to one of these – that of July 1842- June 1844- and permitted to digitally photograph it to extract a cohort of Irish names (and some names from Cornwall) that would provide an indicator of the stock of names of mineworkers resident at Allihies in West Cork prior to the famine. This is the first time that a stock of names that were actually engaged in mining in Ireland has been used to try and trace subsequent migration patterns in Britain and the US.

We achieved our objective of extracting a stock 519 names which we believe to be unique individuals from the Cost Book that covered a period of six months (July 1842-Dec 1842).

Previous research by Barnes had shown that there was not much variation in names over a longer period (1824-1834). The extracted names were fed into an Access database. Given the absence of census data we had to surmount several difficulties to eliminate duplicates. One of the major problems in dealing with Irish surnames is the prevalence of one surname in a locality. The main names of the Béara Peninsula are (O') Sullivan, Harrington. There are substantial numbers of Sheas, O'Neills, McCarthys and Murphys. In common with most districts of Ireland there are also many Kellys.

The cost books tended to omit the O' from names. Riobáird O'Dwyer, Beara genealogist (see reference section for his published records), notes that lower class people had the O' omitted in the parish registers whereas for the upper classes it was put in and his tables on the Rootsweb site all have the O's in. There could be something of a problem here as while both Sullivan and O'Sullivan are common variants, it is very unusual to see, for example, O'Brien without the O'. We have left them out of the tables derived from the cost books, but included them in SQL by using the * operator.

Riobáird O'Dwyer attests that there are more than 80 distinguishable lines of Sullivan on Béara. One consequence of this is the use of nick-surnames. These often bear no resemblance to the original name. For example, Caskey (three appear in the Cost Book) is really Harrington; Brohill is Sullivan and so on. Using the data from Riobáird O'Dwyer's tables on Rootsweb, we changed nick-surnames to the proper surname. We are assuming that someone with the name Caskey reverted to Harrington when they left Béara, as we ran queries that determined that none of the Nickname forms of surnames were found in the Census data for the US and England and Wales. This may, of course, give false positives, but we have decided to do this on the basis of a conversation with Riobáird O'Dwyer.

Some nick-surnames are impossible to distinguish. Bawn and Duve are common, Bawn meaning white or fair-haired, Duve meaning Black. In Riobáird O'Dwyer's tables there are a number of different instances of Bawn, but Duve always seems to go with Harrington. We therefore changed the Duves to Harrington. Foulou in the cost book does not appear in any of Riobáird O'Dwyer's lists, the closest is Foley and we have therefore changed the name to that.

The following gives the list of names we changed; these are in the database as "Nickname" with the generic name as "Surname"

Nickname	becomes	Surname
Barroul		Sullivan
Brohill		Sullivan
Capey		Harrington
Caupey		Harrington
Caskey		Harrington
Causkey		Harrington
Comba(w)		Sullivan
Coulagh		Sullivan
Crompane		Sullivan
Duve		Harrington
Foulou		Foley
Green		Sullivan
Hur(r)ig		Sullivan
Keabough		Harrington
Mahise		Murphy
McTigue		Sullivan
Minihan(e)/Manahane		O'Driscoll
Reen		O'Leary
Rohane		McCarthy
Roughterry		Sullivan
Seer		Sullivan
Sullivan + accretion*		Sullivan
Swonish		Sullivan

| Trokerry | Harrington |
| Ukerry | Sullivan |

* Sullivan appears in the Cost Book with the following accretions: Bawn, Gow, Moore (probably Mór, Gaelic for Big) and Rowe

Besides these, which we changed, there are a number which we suspect are nicknames, but we have not been able to find an alternative. These include:

Bawn – could be anything as it means "white" or fairhaired
Column – similar to Gaelic for Dove, therefore probably a nickname for Harrington or Sullivan
Coskerry – unidentified
Croneen – could be Cronin
Meregough - unidentified
Oage (*Ogue*) – Óg means "young" in Gaelic, usually used to distinguish fathers and sons
Sharig - unidentified

In addition to this, there was more than one clerk who wrote up the Cost Book and this invariably resulted in a difference in spelling. Variations in the spelling of Irish names by English speakers are common and thus we have taken Caskey and Causkey to be the same.

Another problem we encountered in using the Cost Book is that it gives no indication of age or familial relationships. We eliminated men obviously working in the same job in different months and we also eliminated men working in different jobs in different months where it was reasonable to conclude that a tutworker might not have managed to secure a bargain in one month and then worked as a company account man (daily worker) instead. In addition, 'men with horses' might have worked in that capacity for a day or two a month in addition to working a pitch underground and would then have to be eliminated. We can say with a reasonable level of confidence that a Bellows Boy with one of the less common names in the Béara working in the same month as a Smith of the same name might well be son and father as opposed to nephew and uncle. Given additional time and resources, this could provide some indicative data for follow up.

Overall, it was difficult to determine whether an individual with a common name such as Daniel Harrington or Cornelius Sullivan is the same individual who might appear in the 1861 Census for Cornwall or the 1870 US Census for Keewenaw without corroborating evidence such as age or details of parents or spouse. It became apparent that without the Irish Census Returns that would have given information about age, place of birth, occupation and familial relationships, we were not going to be able to do much more than link the most common forenames and surnames from Allihies that we had extracted from the Cost Book to names contained within the Census returns for England and Wales and Keweenaw, Michigan, USA where often the place of birth is omitted and the individual is just noted as born in Ireland. However, this is the first time that specific named individuals that were salaried workers recorded in a company Cost Book for a particular mine in Ireland have been searched for outside of their community.

A Cornish migration to Allihies: has a migration network been detected?
We established a migration network from Cornwall to Allihies. However, the project has revealed that the Cornish were never in the mines of Cork in the numbers sometimes thought. The Allihies Cost Book we examined contains very few Cornish names and the data that was assembled for the project was supplemented by information from as many sources as possible (parochial records and genealogical research) to try and capture as many Cornish mineworkers as possible up to the 1870s when the Cornish mining industry entered a terminal decline. A total of 34 were found, and of this number we managed to trace 67% back to their community of origin with some certainty. This proved difficult as in the main we were working with early migration flows and reliant on parochial records and the IGI (which is incomplete), as the Census of Population for Cornwall really only becomes useful after 1851 for offering reliable data on parish of birth and detailing familial relationships.

The data uncovered that this was a migration flow of a few, highly skilled mineworkers such as Mine Captains, engineers, timbermen and ore dressers. At the Allihies Mines they never numbered more than a handful in any decade and were accommodated in a small, purpose-built village separated from the Irish miners, the ruins of which are extant. The small number of mineworkers we were dealing with makes it difficult to make any definite observations, but it appears that the migration flow from Cornwall to Béara was locally specific, in this instance, mainly from the St Agnes district that accounted for 65% of migrants with a known parish of departure. The migration flow appears to have commenced in 1812 with the Captaincy of Edward Nettle of St Agnes. Often pioneer migrants will send for relatives and people known to them, kin, past employees or colleagues, and they in turn call upon people drawn from their social circle to join them; a self-sustaining migration network emerges. Four Reed brothers of St Agnes, three of whom were Mine Captains and one a timberman at Allihies during the early nineteenth century, characterise the importance of kin networks in migration with brothers joining brothers.

We managed to ascertain that 18% of the Cornish mineworkers died at Allihies and 15% returned to Cornwall. Some however, moved elsewhere from Allihies; Thomas Trewhella of Crowan migrated to Coquimbo, Chile, where he found employment in the copper mining industry; Samuel Reed and John Gill of St Agnes both migrated to the US before 1850. The former settled first in Potosi, Missouri, then in Bremer County, Iowa, while the latter migrated to South Dakota. Robert Richard Nancarrow migrated to Llanidoes, Wales. With the exception of John Gill, all of these men were Mine Captains or Agents, underlining the ease with which Cornishmen of this calibre could find employment overseas.

The Allihies Cost Book: relative skill levels and the ramifications for mineworker's migration
The tribute and tutwork system was introduced by the Cornish whereby a tribute 'pare' (group of men) bid against each other on settling day (a kind of Dutch auction) to work a 'pitch' in the mine at a certain value per ton of ore mined. Tutworkers undertook important development work such as driving tunnels and sinking winzes (tunnels that connected two levels) and bargained for a flat rate wage with the Mine Captain in much the same way as the tributers. Analysis of the Cost Books by Olive Barnes (2004) has revealed that majority of tribute and tutwork contractors were Irish, not Cornish, revealing their level of skill.

This proves that at the Allihies Mines there were hundreds of highly skilled and competent Irish miners well before the mid-1840s. This has interesting ramifications for their migration outside Ireland, particularly to the mines of Michigan in the 1860s and later, Butte, Montana. In mainstream American historiography, the Irish are invariably cast as semi-skilled and are not acknowledged as being hard rock miners of any note. This accolade belongs to the Cornish, their ethnic rivals in the rapidly developing mining centres of the US. Yet our research suggests that this assumption needs to be challenged. By the 1860s there were many hundreds of skilled mineworkers in West Cork with levels of competence equal to any Cornish miner and they would have taken their skills in hard rock mining to new centres of mining activity, like the Keweenaw in Michigan.

Allihies mineworkers in Cornwall in 1861: has a migration network been detected?
This objective was partially met, but the lack of corroborative data (especially Census Returns) makes it difficult to be absolutely sure that the name of an individual in the 1861 Census for Cornwall is the same as that which appears in the Allihies Cost Book.

A total of 268 Irish born male and female mineworkers can be identified on the 1861 Census for Cornwall. There is some clustering in mining parishes: 4% in Gwennap; 8.5% in Redruth; 9% in Wendron; 10% in St Agnes; 19% in Illogan and 30% in Camborne. By the 1860s, the tin mining parishes of Illogan and Camborne were in the ascendancy as copper mining diminished in parishes such as Redruth and Gwennap. Camborne and Illogan held good work prospects and were attracting mineworkers from parishes across Cornwall as well as Ireland. Many of the Irish appeared to be centred in the village of Brea that straddles both Camborne and Illogan. This clustering has been documented by Miskell (1996), but she makes no attempt to explain how the Irish came to be there or from where in Ireland they originated. It

would be tempting to speculate that the prevalence of mineworkers in St Agnes parish is the result of contact with the Cornish immigrant workers in Allihies who came largely from this parish. However, the surnames appear not to be among the stock we extracted from the Allihies Cost Book. But that is not to suggest that the Irish mineworkers that were resident in St Agnes parish in 1861 had not worked in Allihies at a time after the mid-1840s. Further evidence would be required to test this hypothesis.

We ascertained that there are 36 common names of individuals born before 1845 from Allihies, Beara, that appear in the 1861 Census for Cornwall that could conceivably be individuals that appear in the Cost Book:

>(Query *Beara42 Cornwall61 Common Names YOB<1845*):
>Daniel with Driscoll, Harrington, Leary, McCarthy, Sullivan;
>Denis with Leary, Sullivan;
>James Sullivan;
>Jeremiah with Harrington, Sullivan;
>John with Courtney, Driscoll, Harrington, Healy, Lynch, McCarthy, Murphy, Sullivan;
>Mark Sullivan;
>Mary with Donovan, Sullivan;
>Michael with Leary, McCarthy, Murphy, Sullivan;
>Owen Sullivan;
>Patrick with Leary, Murphy;
>Richard with Donovan, Sullivan;
>Timothy with McCarthy, Regan, Sullivan;
>William with Seymour, Skinner.

Restricting the table to those noted in the Census as being born in Cork yields 10 individuals in Cornwall whose name exactly matches a name from Allihies. They are:

Daniel McCarthy (x2)	China Clay labourer; Coast Guard
Daniel Sullivan	Outdoor labourer
John Driscoll (x2)	Agricultural labourer; China Clay labourer
John Lynch	Soldier, Pvt 61st Foot
Mary Sullivan	No occupation stated
Michael Murphy	Agricultural labourer
Patrick Murphy	Licensed hawker of Drapery

However, none of these were engaged in hard rock mining, with only two, Daniel McCarthy and John Driscoll, employed in the china clay industry and resident in the St Austell area.

Cornish and Irish mineworkers in Michigan: have migration networks been detected?
We had a good success rate with tracing communities of origin for the Cornish mineworkers, and some success with the Irish. The Keweenaw Peninsula, Michigan, USA, is an important centre of metalliferous mining, in this case of copper. Its rich mines were developed from the early 1850s attracting many migrants, especially those from Cornwall and Ireland. The development of mines in Keweenaw came at a time (the 1860s) of problems in both the Cornish and Irish copper mining industry which would make it a good candidate for studying migration patterns. We extracted a cohort of Irish and Cornish mineworkers from 1870 US Census of Population centred on the Eagle Harbour and Copper Falls area in the far north of the Keweenaw in Michigan and conducted additional information on the Irish in Calumet Precinct to the south.

It is already documented in the work of Mulligan (2001) that Irish miners went first to Michigan and then on to Butte, Montana. The project confirms that with the surname analysis from the cost books. There were, in total, 369 Irish individuals in the data we extracted, of which 149 were engaged in mining:

72% (107) Copper Miners

0.6% (1) Copper Washer
23% (35) Surface Labourers
0.6% (1) Mine Superintendent
2% (3) 'Miners'
1% (2) Mine Captains

We ascertained that there are 24 common names that appear in both the Allihies Mine Cost Book and in Keewenaw Census Data. As this query (*Beara42 Keewenaw70 Common Names YOB<1845*) specifies a year of birth earlier than 1845 (YOB<1845), it is conceivable that these could be the same individuals:

> Cornelius with Murphy, Sullivan
> Daniel with Murphy, Shea, Sullivan
> James Murphy
> Jerry Harrington
> John with Foley, Harrington, Lynch, McCarthy, Murphy
> Mark Sullivan
> Mary with Harrington, Lynch, Sullivan
> Michael with Shea, Sullivan
> Patrick with Hanley, Harrington, Sullivan
> Timothy with McCarthy, Shea
> William Carter

However, as the Keweenaw data does not include detail other than country of birth we could not refine by county as with the Irish in Cornwall data. It is worth noting here the appearance of the Christian name 'Mark'. Barnes does not note this among names in the Cost Books for the period 1825-1834 that she researched for her MA thesis. One of the Mine Captains at Allihies was Cornishman, Mark Reed, thus a new Christian name would appear to have been introduced to the Béara community.

With the exception of the following all the above had occupations in the mining industry in Keewenaw:

James Murphy	Chops Wood
John Foley	Grocer
Mary Sullivan	Keeps house
Mary Harrington	Keeps house
Mary Lynch	Keeps house

Of those within our cohort for whom we managed to tie down a date of migration (using births of children for example), a large number arrived in the Keweenaw in the decades 1851-1861 and rather more in the decade 1861-1870. This is unsurprising given that the mines in Keweenaw were just beginning to flourish during this period. We see a similar pattern for Cornish miners (see below).

Four per cent arrived in Michigan by way of Massachusetts, just over 3% via New York, a further 2% via neighbouring Wisconsin and one individual from Pennsylvania. Predominantly, Irish miners came into the north-east ports of entry: Boston and New York. There is little evidence of the Irish miners in our cohort having spent much time in England judging by examples of intermarriage and the births of children. This suggests that the migration of mineworkers from Béara was overwhelmingly straight to Michigan raising the distinct possibility of a migration network, but one that would require far more time to substantiate using the research undertaken by family historians who have traced their ancestors back to Béara.

The Cornish mineworkers we extracted from the Census (using knowledge of the stock of names common in Cornwall) had to be confirmed as such as they were simply classified as from England. We achieved this by linking them back to previous Cornish Census returns and genealogical records in Cornwall, a very time-consuming process. Of the 150 Cornish

mineworkers extracted from the 1870 Census, we were able to trace back 115 to their communities of origin in Cornwall. Of the 115, their occupations broke down as following:

0.8% (1) Copper Washer
3 % (3) Engine Drivers
0.8% (1) Machinist
6% (7) Mine Captains
2% (2) Superintendents
85% (98) Miners
0.8% (1) Surface Agent
2% (2) Surface Labourers

Amongst the Cornish we immediately see that at 85% there was a slightly higher incidence of miners among the cohort than with the Irish at 74% (all those noted as 'copper miner' and 'miner'). At just under 9%, there was a much higher percentage of men engaged in mine management (Superintendent, Mine Captain, Surface Agent) than with the Irish at under 2%, and a much lower number of Cornishmen described as surface labourers (2% of the Cornish as opposed to 23% of the Irish). None of the Irish are noted as a mine engine driver, a highly skilled job that the Cornish invariably tried to keep to themselves.

The occupational breakdown of the Cornish and Irish mineworkers at first sight appears to support the conventional interpretation of the Irish as being less skilled than the Cornish miners. However, if the observation made of the Irish in much mainstream American literature were true: 'The Cornishman knew better than anyone how to break rock, how to timber bad ground and how to make the other fellow shovel it, tram it, and hoist it' (Young, 1976), the 'other fellow' usually being an Irishman, one old Cornish miner scathingly noting that, 'wheelbarrows were dispensations of Providence, inasmuch as they taught Irishmen to walk upright' (Lescohier, 1995) we would have expected to see more Irish described as surface labourers and rather less as miners. This suggests that the hypothesis that the Irish were unskilled immigrants needs to be revised.

There were 35 Cornish mineworkers whom we could not definitely link to a parish of origin because of patronymic names like Williams, Richards, Thomas, etc., which are very common, particularly in west Cornwall. Our research revealed that Cornish migration flows to the Eagle Harbour, Copper Falls area of Michigan were localised and highly specific. The majority of the migrants to this area of Keweenaw came from the mining parish of Camborne and neighbouring parishes of west Cornwall. Camborne in the late nineteenth century was one of the fastest growing parishes in Cornwall, drawing in people from surrounding parishes, as it rapidly industrialised. By the 1870s, metalliferous mining was beginning to contract to a core of activity centred around Camborne where the development of deep tin mines and heavy engineering offset the collapse of copper so devastating in other parts of the region.

Although Camborne's population was growing rapidly as it mines and foundries expanded, it was also the parish of departure for many miners. Research on migration flows to Latin America (Schwartz 2005) reveals that Camborne was losing the majority of its population at precisely the time that it was growing most rapidly and witnessing the most success - the late nineteenth century. We appear to be seeing the same process with migration from Camborne and district to the Keweenaw in Michigan. This challenges the conventional Cornwall-wide crisis migration hypothesis: people migrated most in the years following the copper crash (1866) because there was no work. It might be more a case of how far could people migrate (see the Roose data below), if at all, when there was an economic downturn. This research has demonstrated that caution needs to be exercised against making Cornwall-wide generalisations about the timing and direction of migration flows which were in no way homogenous.

Parish of departure of Cornish mineworkers to Keweenaw
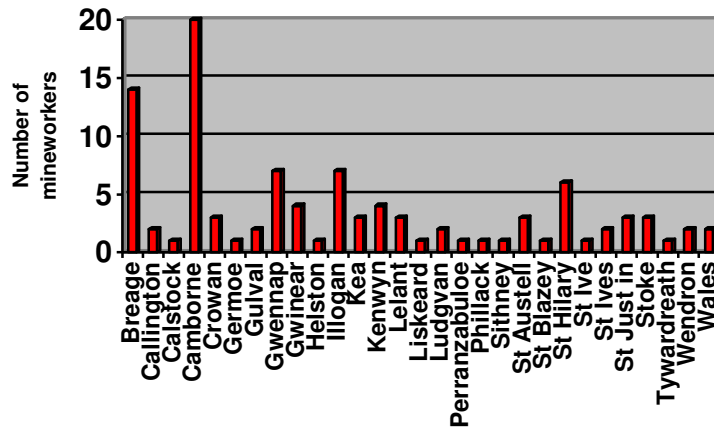
We determined that 43% of the Cornish mineworkers migrated from a different parish than that in which they were born and 57% migrated from their parish of birth. Of those who did not migrate from their native parish, 27% had moved over 10 miles and 69% had moved less than 10 miles. 4% had moved out of county (in this case to Wales). There was surprisingly little movement to destinations outside Cornwall before migration to Michigan, with only one miner, John Trethewey, native of St Erth parish, having been in Canada prior to migration to Eagle Harbour. Besides this miner, the entire Cornish cohort appeared to have moved directly from Cornwall to the United States of America. If they had moved to Michigan's Upper Peninsula from elsewhere, it was from somewhere in Michigan, or from neighbouring states: Samuel Whear and Richard Bree had migrated from Camborne to Grant Wisconsin prior to moving to Michigan; Josiah Eade of Germoe had been in Illinois before settling in Amygdaloid and Henry Richards Dally of Wendron was in Wisconsin before moving to Amygdaloid.

Very few had been in other US states and with one exception, these were on the east coast or in the south: Richard Harris of Camborne had been in Connecticut before settling at Sherman MI; William Uren had left Crowan for Pennsylvania and then moved to Wisconsin before settling at Eagle Harbour; Richard Trethewey had left St Hilary for Tennessee and then settled at Eagle Harbour; Marmaduke Trebilcock of Gulval had possibly been in Virginia before settling at Eagle Harbour. It was only Isaac Bray of St Austell who had travelled to Michigan from the western US. He had possibly been in Clear Creek Colorado.

This confirms that there was a lot of short distance movement, or constant churning, within Cornwall prior to migration to Michigan confirming the mobility of miners documented as existing within Cornish mining communities (Brooke 1997). The fact that many of these had already made a move before their migration overseas highlights that such individuals probably had a higher propensity to migration across borders. However, they did not appear to have made a move within Britain before migrating to Michigan. Indeed, research has shown that Cornish overseas migration was more significant before the 1870s (see table 1:1) but was superseded by domestic flows in the 1870s (Deacon 2001).

|	Net Cornish migration to counties in England & Wales	Net Cornish overseas migration (% of population)	Total net out-migration (% of population)
1841-50	16,300 (4.76)	21,300 (6.22)	37,600 (10.98)
1851-60	18,400 (5.17)	24,100 (6.78)	42,500 (11.95)

| 1861-70 | 26,200 (7.09) | 38,100 (10.72) | 54,300 (17.81) |
| 1871-80 | 40,800 (11.26) | 35,600 (9.82) | 76,400 (21.08) |

Table 1:1. Net migration from Cornwall 1841-1881.
Source: Deacon 2001.

Of the cohort to Michigan, 34% had an immediate family connection – brothers who travelled together or joined a sibling already in Michigan. This underlines the importance of familial networks in the migration decision. Of the 115 miners we managed to trace, only in 6 cases could we not determine a decennial period of migration.

Decennial migration, Cornwall to Keweenaw, MI, 1841-1870
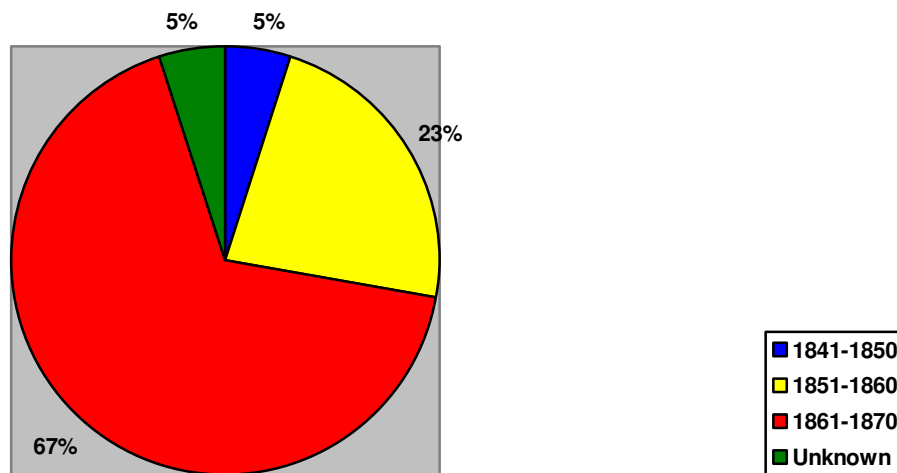
The main period of migration was the decade 1861-1870, when the overall downturn in the Cornish copper mining industry caused many mines to close. However, Camborne escaped the very worst effects of the copper crash as its tin mines boomed following discovery and exploitation of the great flat lode close to the town causing people to migrate into it and surrounding parishes. This was the decade in which Camborne started to boom and it also coincided with the expansive period of copper mining in Keweenaw.

Additional research into Irish immigrants in nearby Calumet Precinct reveals much new information on the age structure of the Irish miners, the pattern of migration by single men showing up in the 1870 census and large families, supported by the miners' wages in 1880 in Calumet, Houghton County. This might mean that single men had gone on to Montana or Nevada by 1880 in search of other mining work. Compared with the Cornish, the Irish had fewer miners and more labourers, but compared with other nationalities, the Irish had far more miners.

There is confirmation of a considerable presence of Irish-born miners in Calumet precinct, Houghton County, Michigan alongside miners from Cornwall (England), Germans, Scandinavians and some French, Canadians and Italians. In 1870, 276 Irish–born adult names are recorded, 141 described as miners, 84 as labourers. The distinction between miners and labourers is indicative of skill levels among Irish migrants. In addition, a further 21 male occupations included carpenters (4), engineers (2), blacksmiths (5) stamp mills (3) who were probably employed in mining. The total number of Irish-born females with specified occupations was 154, 132 (86%) of them described as keeping house and 2 (9%) as domestic servants.

Arrival dates in the United States have been calculated from the birth years of children born to Irish parents. Out of 100 entries, 30 arrived during the 1850s, 26 of them from 1855 onwards, 70 arrived during the 1860s, 50 between 1864 and 1869. One arrived in 1870. There is evidence of an American Civil War effect on reducing immigration to the States. Other states show up en route to Michigan which illustrates the pattern of movement of Irish mining families. Out of 17 recorded instances, 5 listed births in Massachusetts, 2 in New Hampshire, Ohio, New York, and Illinois, 1 each in Iowa, Rhode Island, New Jersey and Virginia. Predominantly, Irish miners came into the north-east ports of entry, Boston and New York. There is little evidence of Irish miners having spent much time in England judging by examples of intermarriage and the births of children. In 1870, five cases have been found of Irish-born wives of Englishmen and one case of an Irishman marrying an English woman. There are also two Irish families with children born in England. This suggests that migration of Irish miners was overwhelmingly from Ireland to the United States and predominantly to Michigan.

The age of miners on arrival in the United States demonstrates, as expected, that mining migration was a young man's game. Of 100 entries where age on entry can be determined by the births of children in the U.S., 74 were aged up to 30 years and 26 aged over 30 years. If we include the group 31 to 35 with those up to 30, the numbers increase to 89 in total. So virtually 9 out of 10 migrants entered the U.S. in the age group up to 35. Another take on age structure, is to look at the ages of Irish boarders in 1870. Out of 101 entries, 69 were 30 or under and 32 were aged over 30. If we include the group 31 to 35, the numbers increase to 80. Predominantly, migration occurred in the age group 20 to 30. What is also significant about the data for 1870 is that more young men lived as boarders (47) than in family structures (18). This suggests that single, young men went out to become established with work in the mines before starting a family or bringing their wives and children out with them.

Of the 276 males, 114 or 41% had become U.S. citizens. This suggests an intention to stay in the United States, if not in the state of Michigan.

The evidence of surname frequency points to a strong connection with names associated with West Cork. The highest name frequencies shown in the 1870 and 1880 censuses as follows:

1	Sullivan	38 in 1870
		24 in 1880
2	Harrington	16 in 1870
		15 in 1880
3	Shea	12 in 1870
		9 in 1880
4	Murphy	8 in 1870
		6 in 1880
5	Kelly	7 in 1870
		7 in 1880
6	0'Neill	5 in 1870
		4 in 1880
7	McCarthy	6 in 1870
		2 in 1880
8	Regan	5 in 1870
		3 in 1880
9	Holland	5 in 1870
		2 in 1880

10	Ryan	5 in 1870
		1 in 1880
11	Sheehan	4 in 1870
		2 in 1880
12	Coughlin	4 in 1870
		1 in 1880
13	Burns	1 in 1870
		4 in 1880
14	Crowley	4 in 1870
15	McGuinness	4 in 1870

In 1870, 77 different surnames are recorded, 61 in 1880, with 41 surnames occurring in both 1870 and 1880. This suggests a different pattern of migration in the 1870s showing up in the 1880 census.

There is a little evidence of Irish miners occupying their own property in the information given on wealth and in a few instances of personal wealth accumulated. There are eighteen recorded examples of real estate or personal wealth listed in the 1870 census. What is striking is the repetition of the surnames – Sullivan, (5) Harrington (2) and Ryan (2), that accounts for a number of the entries, suggestive of family networking and support. While most are simple entries of modest real estate property, ranging from 50 to 500 dollars, there are four examples of estates worth over 1,000 dollars. These belong to:

Batholomew Shea, aged 29, deputy sheriff, property valued at $1,000.

Michael Ryan, aged 40, labourer, with a wife and three children, five boarders, and a servant. His property was valued at $1,200 and his personal wealth at $200.

John Ryan, aged 42, Mining Captain, with a wife and 5 children and a servant.
His property was valued at $3,000 and his personal wealth at $10,000.

Hugh McGuirk, aged 31, a gardener, an English wife and 36 boarders. His real estate was valued at $3,300 and his personal wealth at $2,000.

James Kirwin, aged 30, a general merchant, with a wife and daughter. His real estate which probably included the store was $45,000 and his personal wealth estimated at £3,000.

What is evident here is that the way to acquire wealth was to take in boarders or to sell necessaries to the mining community. It is well known that in the Californian Gold Rush, more wealth was created from providing services, hotels and boarding houses or such items as shovels and jeans sold to the miners than in panning for gold.

In the 1880 census, there are similar results in an analysis of the age structure of arrivals derived from the births of children born in the United States. Seventy-two per cent of the total of 120 were in the age group up to 30 and twenty-eight per cent over thirty; a similar result to the one found in 1870. On the states or countries first found en route to Michigan, Massachusetts led the way with 6 entries followed by New Jersey with 4, and Pennsylvania, Maryland and Kansas with one each. England, with Cornwall mentioned once, had 4 entries. Again, the suggestion is that overwhelmingly Irish miners made their way directly to the United States.

Out of 116 miners who can be traced in terms of their year of arrival in the United States, twenty arrived in the years 1856 to 1864, forty-nine arrived in the period 1865 to 1872, (again post-Civil War numbers increased) and forty-seven were present during the years 1873 to

1880. Of course, this is the mere tip of the iceberg and does not pick up those who moved on to other places.

The biggest difference observed between 1870 and 1880 is in the change in living patterns. Whereas in 1870, considerable numbers of Irish miners were living as boarders in lodging houses, paying for their board and lodging, by 1880, this pattern had disappeared, Of the total of 141 Irish-born adult males, all of them were living within a family structure. In fifteen cases, additional family members were also present, mothers, brothers-in-law etc. In a further five cases, boarders were taken in. The conclusion would be that the miners that stayed in Calumet had families and so were less willing to risk their chances elsewhere. Other single men looked for better prospects in other mining centres in California, Nevada and Montana.

With the pattern of family structures, the wages earned by the miners had to sustain large numbers of women and children. Miners invariably had large families so the mining community was very much larger than the mere numbers of miners employed. In 1880, miners, plus their wives and children totalled 921 people in 141 households. In addition, there were a further 37 relatives and lodgers, making a total of 958, at an average household size of 6.8 persons. The most common size of family was in the range 6-8 people, classically husband, wife and children, a total of 280 people or 29 per cent of all families.

What does this information tell us about the existing Irish and American narratives on the transatlantic migration of hard-rock miners to the United States during the nineteenth century?

Irish miners, identified by surname as originating in West Cork, went directly to the United States, with only a few exceptions involving intermarriage with English and having children born in England. Significant movement from the late 1860s coincided with problems in the mining industry in West Cork and the opening up of copper mines in Michigan. Higher wages available in the United States were an obvious incentive for migrants with knowledge of copper mining. A similar movement by Cornish miners reflected the downturn in local mining opportunities.

Migrants were typically young, single men in their twenties who lodged in boarding houses in Calumet, Michigan in 1870. Those who stayed by 1880 were usually married with large families to support, so less willing to risk further migration to other mining centres.

For a few, there were ways of prospering by providing services in terms of lodging or through the sale of commodities in the mining community. Women could benefit by providing board and lodging as a supplement to a miner's wage. The great majority of women kept house in a large household. A few worked as domestic servants.

The data from Calumet on surname frequency is closely associated with 0'Neill's listing for Houghton County in 1870:

Beara Peninsula:

Rank Order:		Rank Order:	
1	Sullivan	1	Sullivan
2	Harrington	2	Harrington
3	Shea	3	Shea
4	Murphy	4	Murphy
5	McCarthy	5	Leary
6	Kelly	6	McCarthy
7	Ryan	7	Lynch
8	Lynch	8	Kelly
9	0'Brien	9	Dwyer
10	Hanly	10	Crowley

The decline in the numbers of Irish-born in Michigan between 1870 and 1880, being overtaken by native Cornish and Canadians, Finns, Germans Norwegians and Swedes, suggests a further migration to Montana where the Irish built up a large presence.

The old skill argument of Irish miners, in relation to Cornish miners, has some validity in O'Neill's figures on the ratio of labourers to miners in Houghton County in 1870:

Place of birth	Labourers	Miners	Ratio
England	40	433	1:10.82
Ireland	398	456	1:01.11
Germany	260	115	1:00.44
United States	147	19	1:00.12
Canada	422	9	1:00.02

Yet a majority of Irish-born are recorded as miners and this increases by 1880 and in relation to Germans, Americans and Canadians, the Irish clearly had a higher skill ratio.

There is evidence in the patterns of migration and settlement of rational decisions being made in terms of family strategies, both in the first stage of young men emigrating and becoming established, and in the next stage of the settlement of families. Young Irish miners also looked to new mining ventures in moving from Michigan, or from Ahillies to Butte, Montana. In a few cases, the Irish prospered by providing services to boarders or in opening up merchant stores in mining communities.

Cornish and Irish mineworkers in Cumbria: have migration networks been detected?
For the Cumbria study it was decided to look at two iron ore mining communities that had noted populations of both of our ethnic groups: Roose for the Cornish and Cleator Moor for the Irish. We achieved a great degree of success in revealing a discrete migration network for the Cornish immigrants in Roose, and were able to explain this using corroborative documentary evidence.

Iron ore was discovered at the Stank Mines in the 1860s. By 1869, 774,000 tons were exploited; 874,000 in 1870 and 931,000 in 1871. Cornish miners were familiar with the success of the Hadbarrow Mine at Millom (there was a discrete Cornish community at Moor Row) and the nearby settlement of Barrow was almost swamped by immigrant workers in the 1860s. The rise of the Stank Mines coincided with the demise of the Cornish copper mining industry prompting a large migration to Cumbria. A shortage of accommodation for the miners who came to work in the Stank Mines caused the settlement of Roose to be developed close to the mine workings. It was a fairly isolated community back then, comprising 196 cottages in two rows (North and South Rows), built by the Barrow Haematite and Steel Company on land purchased from the Duke of Devonshire for £6,940 in 1873-74. Hundreds of Cornish miners made Roose their home, transplanting their values and cultural traditions. Because it was a physically isolated community, it meant that this quintessentially 'Cornish village in Furness' remained undisturbed for a generation (Trescatherick 1983).

The cohort consisted of 148 males 15 and over, described as connected to the mines (engine driver, iron miner). Very few were engaged in anything other than mining, highlighting the relative homogeneity of the migration flows there. The data provides overwhelming evidence that the demographic flow from Cornwall to Roose was closely governed by occupational specificity. Linking back to the 1871 Census, 26% of the cohort could not be traced in the Census of Population for England and Wales. This is probably due to the prevalence of names such as Williams or Richards which make nominal record linkage difficult, an age discrepancy or misspelling of their name that prevented linkage. It might also indicate that some were overseas before migration to Roose. If these men were single before their migration to Roose we cannot use the birthplace of any offspring to determine where they were resident prior to their migration there.

27% of the cohort was residing in England. Of this total, by far the most were resident in Dalton, Lancashire; an iron mining community. Those of the cohort of working age on the

1871 Census return for Dalton were described as iron miners. Cornishmen resident in Dalton in 1871 accounted for 40% of the Cornish who were resident in Roose in 1881 suggesting the presence of a strong migration flow from Cornwall to Dalton and then onto Roose in Cumbria. There does not seem to be any strong pattern of movement from the migrant's parish of birth in Cornwall to Dalton, except a small cluster from the St Hilary and Crowan area and another from Menheniot. There were smaller clusters of the Cornish cohort in Moorsley, Durham and Seaton Delavel in 1871. Both these communities were coal mining areas and the cohort with an occupation are given as coal miners. The Moorsley miners came from central and east Cornwall parishes, none from the west. Those in Seaton Dalavel were mainly from one family from Southill.

Using data collated from published Census figures that have been added to those calculated by Baines, Deacon (2001) has shown that Cornish overseas migration was more significant before the 1870s but was superseded by domestic flows in the 1870s. The Roose data seems to confirm this. 47% of the cohort was in Cornwall in 1871. The majority of the migrants came from parishes in the west of the region which were witness to large-scale copper mining: Gwennap (19%); the area centred on the parishes of Breage, St Hilary, Marazion, Perranuthnoe and Germoe (19%); Gwinear (7%), Illogan (7%) and Camborne (6%). It appears from the data that most of the Cornish came to Roose directly from Cornwall revealing the presence of a discernible migration network.

This is interesting as it seems to support the hypothesis that at times of economic depression, when it was important to minimise risk by lowering the cost of migration, short distance movement, in this case to other parts of Britain and not overseas, was more prevalent. This contrasts with the migration patterns from Camborne and indeed from Breage to Michigan in the 1860s and 70s. People had more money to fund migration across international borders before the copper crash of 1866. By contrast, those moving from depressed former copper mining areas appear to have had the capital only to move up the country and not overseas by the late 1870s.

There were no advertisements in the Cornish press advertising work for miners at Roose so the locally specific migration networks from the Breage-Germoe and Gwennap areas appears to highlight the presence of a deliberate recruitment policy within the mining industry by word of mouth. Indeed, documentary evidence corroborates this. The migration network from the Breage-Germoe area can be explained. One H.W. Schneider, the most influential individual at Barrow Haematite Steel Company, had a strong connection with Cornwall where he had formerly been the Chairman of Helston Wheal Vor Mine in 1853-8, until forced to resign. Leaving Cornwall, he focused his energies into developing the Stank Mines.

Schneider used his contacts in Cornish mining to recruit men known to him, particularly in the Wheal Vor area, which is centred on the Breage-Germoe district. He would not have found this task difficult as Wheal Vor had closed in 1860 and the Cornish mining industry suffered a calamitous crash in 1866, caused by the failure of banking giants, Overend and Gurney, which had sent shock waves through the financial markets. This had caused the closure of numerous copper mines in parishes such as Gwennap and in the Breage-Germoe area. The demise of mining in certain localities in Cornwall coincided fortuitously with the rise of the Stank Mines. Those who arrived from Cornwall were probably recruited by Mine Agents whom Schneider knew and trusted, and were chosen for their high level of skill. With the demise of the Stank mines, documentary evidence notes that many of the Cornish miners migrated to South Africa, which boomed for a good two decades after 1880, and the Cornish presence in Roose began to diminish.

The mines of Cleator Moor were reputedly first worked by twelfth century monks. Rich deposits of iron ore were found close to the surface in the 1780's. The Cleator Moor Iron Works were built in 1842 and the town and the nearby village of Cleator grew rapidly attracting miners from Ireland who disembarked at Whitehaven. In the early 1870's demand for steel was increased by the Franco-Prussian War. Only Cumbrian haematite ore was suitable, and available in quantity, for producing steel by the Bessemer process. The price rose to 35/- a ton, with mining costs typically of only 5/- a ton. Furness and Cleator Moor became the richest mining areas in the world.

There were many Irish described as iron ore miners in Cleator Moor in 1881, but we found very few West Cork names among them. Of the 220 Irish we extracted from the Census Return, there are only two names that appear among those we took from the Cost Book: John Kelly and Michael Murphy. Their dates of birth, 1832 and 1857 respectively, mean that there is a slight chance that the former could be among the 519 individuals extracted from the Cost Book. But as these names are common to Ireland as a whole the men might not even be from West Cork.

Indeed, the stock of names suggests that the immigrant miners from Ireland were mostly from the northern counties but some were from Wicklow. This is endorsed by documentary evidence, namely Denvir (1892) who wrote in his in his survey of the Irish in Britain: 'The bulk of the Irish in Cumberland are employed at the coal pits, in the iron mines, at the cinder ovens, and the blast furnaces. Though most are from the north of Ireland there are men in the iron mines who came from the lead and copper mines of Wicklow. Although the great bulk of the Ulstermen who cross into Cumberland are Catholics and staunch nationalists, a number of Orangemen have come over too. Some of these were formerly engaged at the shipbuilding yards at Whitehaven, but of late years there has been but little employment for them. Some also work at the pits and iron-works.' It seems that geographical proximity to the northern counties of Ireland played a strong role here, as it would be easier for immigrant miners from this part of Ireland to travel to Cumbria than those from West Cork.

Linking back, we also examined the Census for Cleator in 1861 and found 19 matching names between Cleator and Beara, including two James Murphys from Beara and two from Cleator giving 4 records for this match (i.e., James Murphy (Beara), Occupation, Smith Work, matched with James Murphy (Cleator), Iron Ore Miner).

However once these were refined for age, the results vary dramatically (we took 1845 as a date of birth to refine the results). We found six common names from Beara and Cleator

        (Query *Beara42 Cleator61 Common Names YOB<1845*):
        James Murphy
        John Kelly
        John Murphy
        Michael Murphy
        Patrick Murphy
        Patrick Kelly

All except Michael Murphy (Occupation General Labourer) are employed in mining of some kind. However, none give a place of birth.

The lack of West Cork mineworkers in our study area of Cumbria is indicative that migration networks between West Cork and Cleator were not significant. It seems more probable that the majority of migrants from West Cork looked across the Atlantic for work, and took ship for the United States, rather than to this part of Britain. The Irish mineworkers who appear in the 1881 Cleator Census used different migration routes and networks than our miners from West Cork.

Conclusions
Our research has shown that it is possible, with sufficient data and research time, to demonstrate the presence of discernible migration networks, as in the case of the Cornish in Allihies, CopperFalls/Eagle Harbour, Keweenaw, and Roose in Cumbria. However, with the Irish data we were unable to go much beyond surname ramification and were limited by time as well as by the absence of corroborative material, although we did demonstrate that there were probably mineworkers from Allihies present in Cornwall in 1861 and Keweenaw in 1870. There were numerous iron miners from Ireland in Cleator, but these appear not to have some from West Cork which suggests that the migration flow from there was probably more focussed on the US. It is hoped that placing the Irish data on our project website will result in genealogists adding to the information we have obtained so far.

We have demonstrated that there are Irish names which occur in both datasets. As this was only a pilot project, a future project could take this further by subjecting our data to the Cambridge isonymic system that would give us a reliability factor for any individual being in both datasets. It would be interesting to use the Welsh as another case study, as this ethnic group would probably fall somewhere between the Cornish and the Irish in terms of difficulty in tracing migration networks. There is sufficient census data to tie people to their parishes of origin as with the Cornish, but the high frequency of certain surnames (Williams, Jones, Jenkins, Thomas etc.) would present problems such as we found among the Irish from West Cork.

The data for this small pilot project shows that migration flows from Cornwall were complex with differences in the direction and timing of internal and external migration. Migration to Ireland in the early nineteenth century, when the Cornish mining industry was booming, was of a few skilled individuals mainly from the St Agnes area and was symptomatic of success, not failure or crisis. By the 1870s the picture is less clear cut. Conventional interpretations give the impression that the quarter of a century from 1866 was one of unparalleled gloom and depression across the county. The suffering of the Cornish population at this time cannot be denied and indeed is well documented, but to suggest that the whole period was one of depression, decline and paralysis is perhaps an overstatement which has implications for explaining migration flows.

Some industrial areas were waning as others waxed: Gwennap and Breage-Germoe were spent forces industrially by 1870, most of their famous mines closed, yet Camborne was in the ascendancy as an industrial area as tin was exploited in mines along the Great Flat Lode and the town became a centre of engineering excellence employing many people. Therefore, the period that is often referred to as one of decline and paralysis in Cornwall witnessed times of economic growth and diversification at different times and in different localities. This perhaps enabled people to acquire the capital necessary to fund overseas migration from certain areas, but not others, where movement within Britain was more the norm. A more detailed study of global Cornish migration flows needs to be undertaken and cross-referenced with local economic data to further test this hypothesis.

Significant movement of Irish miners from the late 1860s coincided with the onset of problems in the mining industry in West Cork (the mines were sold in 1868 to the Mining Company of Ireland; they changed hands the same year amid a scandal to the Berehaven Mining Company) and the opening up of copper mines in Michigan. Higher wages available in the United States were an obvious incentive for migrants with knowledge of copper mining. In the Irish literature on mining (Cowman) and the American literature (Mulligan), there is a traditional interpretation of Irish miners, living in very poor conditions (Ahillies the worst in Ireland), driven out by cruel, foreign employers and the absence of British capital investment. They were the hapless victims of British imperialism and global capitalism. In Michigan, in the face of anti-Catholic and anti-Irish prejudice, they join together for defence in such organizations as St. Patrick's Societies and the Ancient Order of Hibernians.

However, our research challenges this victim interpretation. This comparative study of Irish and Cornish miners, suggests that both groups were prompted by similar economic conditions at home and by new opportunities to improve their earning power in a process of skill-migration particularly in the United States and there is evidence in the patterns of migration and settlement of rational decisions being made in terms of family strategies.

The migration flows of the Cornish and Irish to Michigan, in addition to the Irish in Cornwall and the Cornish in West Cork the north west of England reveal the complexity and diversity of metalliferous migration patterns in the nineteenth century.

References
Barnes, Olive R.M. 2004. 'Productivity amongst the Irish of Béara 1825-1834'. Unpublished MA Thesis: Bath Spa University College.

Belchem, J. 1990. *Liverpool in the year of revolution: the political and associational culture of the Irish immigrant community in 1848*, Liverpool: Liverpool University Press.

Brooke, Justin. 1997. 'Henric Kalmeter's Account of Mining and Smelting in the South West in 1724-25'. Unpublished MPhil Thesis: University of Exeter.

Burchall, R.A. 1979. *The San Francisco Irish 1848-1880*, Manchester: Manchester University Press.

Cowman, Des. 1983. 'Life and Labour in Three Irish Mining Communities, Circa 1840,' in *Saothar: Journal of Irish Labour History* 9, 11.

Davis, Graham. 1991 *The Irish in Britain 1815-1914*, Dublin: Gill and Macmillan.

Deacon, Bernard. 2001. 'The reformation of territorial identity: Cornwall in the nineteenth and twentieth centuries', Unpublished PhD Thesis: Open University.

Denvir, J. 1892. *The Irish in Britain*, London: Kegan Paul.

Emmons, David 1989. *The Butte Irish: Class and Ethnicity in an American Mining Town, 1875-1925*. Urbana: University of Illinois Press

Faist, Thomas. 2000. *The Volume and Dynamics of International Migration and Transnational Social Spaces*. Oxford: Clarendon Press.

Kenny, Kevin. 1998. *Making Sense of the Molly Maguires*. New York: Oxford University Press.

Lescohier, Roger P. 1995. *Giants of Grass Valley: History of the Empire and North Star Mines 1850-1956*. Grass Valley.

MacLysaght, Edward. 1985. *The Surnames of Ireland*, 6th edition. Dublin: Irish Academic Press.

MacRaild, Donald M. 1998. *Culture, Conflict and Migration: The Irish in Victorian Cumbria*. Liverpool: Liverpool University Press.

Miskell, Louise. 1996. 'Custom, Conflict and Community: A Study of the Irish in South Wales and Cornwall, 1961-1891. Unpublished PhD Thesis, University of Wales.

Mulligan, William H. 2001. 'Irish Immigrants in Michigan's Copper Country' *New Hibernia Review* - Volume 5, Number 4, pp. 109-122.

Mulligan, William H. 2001. 'From the Beara to the Keweenaw: The Migration of Irish Miners from Allihies, County Cork to the Keweenaw Peninsula, Michigan, USA, 1845-1880', *Journal of the Mining Heritage Trust of Ireland*: 1, pp. 19-24.

O'Dwyer,Riobard. *Who Were My Ancestors*. Four volumes representing the parishes of Eyeries (1976), Allihies (1988), Castletownbere (1989), and Bere Island (1989). Astoria: Stevens.

Payton, Philip. 1999. *The Cornish Overseas*. Fowey: Alexander Associates.

Rowe, John. 1973. *The Hard Rock Men: Cornish Immigrants and the North American Mining Frontier*. Liverpool: Liverpool University Press.

Schwartz, Sharron P. 2005. 'Migration Networks and the Transnationalisation of Social Capital: Cornish Migration to Latin America, a Case Study', *Cornish Studies:* 13. Exeter: University of Exeter Press.

Trescatherick, Bryn. 1983. *Roose -a Cornish Village in Furness*. Barrow.

Williams, R.A. 1991. *The Berehaven Copper Mines*. British Mining No. 42, Sheffield.

Young, Otis.1976. *Black Powder and Hand Steel*. Norman.