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IV

PART IV: SOCIOLOGY

(i) THE WORKFORCE.

Numbers and working conditions.

Compared to the mammoth Dinorwic and Penrhyn Quarries (employing about 3,000 men each, at the peak of activity), the Dorothea Quarry was a small concern. The maximum size of the workforce at Dorothea was about 550, achieved during the late nineteenth century, and the only other Nantlle concern that consistently matched that figure was Pen-yr-orsedd; the majority of Nantlle quarries employed under 200 men each during the same period. It is difficult to compile data illustrating the growth and decline of the workforce at Dorothea, due to incomplete and conflicting information, plus the monthly variations in numbers. The general trend for the nineteenth century was as follows:

1840s	-	100-200	employees
1850s	-	100-150	"
1860s	-	150-200	"
1870s	-	400-450	"
1880s	-	500-550	"
1890s	-	420-530	"

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The main expansion in numbers took place after the appointment of J.J.Evans as Quarry Manager in 1865, and the scale of quarrying increased until 1885, when the pits were inundated by the Lower Nantlle Lake. During the trade recession of the late 1880s, and the difficult early years of the 1890s (when the quarry was severely disrupted by landslides), the number employed at Dorothea decreased by 20 per cent, but the former level had been regained by the late 1890s.

The twentieth century was a period of decline for the slate industry, and this trend is mirrored in the Dorothea employment statistics, viz:

1900s	-	290-520	employees
1910s	-	200-330	"
1920s	-	260-420	"
1930s	-	250-440	"
1940s	-	120-240	"
1950s	-	70-180	"
1960s	-	30- 70	"

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The most notable feature of the data for 1900-70 are the large fluctuations in each decade, with an overall reduction in numbers in every consecutive period. These variations were responses to changes in the slate market; during trade recessions, some labourers (on development work) and tip slatemakers ("heapers") were discharged, and a few of the less remunerative 'bargains' would be closed, thus reducing the total production costs. One such period was 1904-10, and 1908 was of special note, because quarrying at Dorothea was reduced by half, 142 quarrymen being sacked upon the closure of Quarry B. Similarly, trade conditions led to a rise in the number employed immediately after 1918, followed by a decrease during the recessions of 1922-3 and 1928-32. However, the largest reduction in the Dorothea workforce occurred during the Second World War. The number employed dropped from about 390 in 1938 to 140 in 1940, recovering slightly (to about 240) by 1944-5. After the war, the labour force diminished consistently due to several factors, viz:

men leaving the area for better-paid jobs elsewhere; fewer young people entering the industry to replace older workers; and a general decrease in the scale of quarrying.

The significance of the above statistics can be evaluated by referring to the total figures for employment and population. The former is included in the following table:

Year	Approx. total of quarrymen at Nantlle	Approx number of quarries
1814	50	5
1864	1,500	15
1877	2,700	18
1882	2,400	15
1898	3,100	21
1913	1,760	16
1922	1,670	15
1934	1,100	9
1945	400	6
1960	200	4
1970	40	3
1980	18	4

2

Comparison of the Dorothea figures and the totals shows that the initial rapid expansion of the former in the 1860s matched the trend in the totals. However, the Dorothea Quarry had passed its peak by the 1880s, whilst the maximum output for the area was in 1898. The population trend was as follows:

Year	Population of Nantlle area	Llanllyfni Parish only
1801	2,873	872
1821	4,072	1,182
1841	6,291	2,017
1861	6,847	2,362
1881	11,841	5,520
1901	12,115	-
1921	9,693	-
1951	9,316	-

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One difficulty of compiling such data is the definition of area boundaries. The 'Nantlle area' in the above table was defined by Dr. J. Lindsay, and probably extends from Groeslon (5 miles south of Caernarfon) to Nebo (3 miles south of Groeslon), and 3 miles eastwards from this line. Included in the area are the villages of Carmel, Groeslon, Fron, Llanllyfni, Nantlle, Pen-y-groes, Rhosgadfan (possibly), and Tal-y-sarn. About half of the area is within Llanllyfni Parish whilst the remainder comprises part of Llandwrog Parish.

The structure of the Dorothea labour force was typical of a medium-sized slate quarry, having a significant proportion of non-productive labour, involved in maintenance and services. The workforce can be divided into three main categories, viz:

1. Production workers, principally "bargainmen", tip-contractors ("heapers"), and "rubbishers". The first category were the crews (of 4 or 5 men), who undertook monthly contracts ("bargains") on defined sections of the quarry, to produce roofing slates. Two of each crew would be engaged on winning the slate blocks from the rock face, whilst

their 'partners' on the quarry bank were slatemakers. Each crew employed one or more senior apprentices ("journeymen") as semi-skilled assistants. The junior apprentices ("rubbishers") relied entirely upon the goodwill of the bargainer-slatemaker for small blocks of slate, to learn the skills, and earn a small wage. In return, they gave assistance during the unloading of waggons, etc. There were, in addition, adult "rubbishers", being partially-skilled slatemakers, or newcomers to the quarry. These workers had not been able to enter into the bargaining system (for lack of skill or lack of suitable opportunity), and also made a living from charity, in exchange for services rendered. Many of these adult "rubbishers" became tip-contractors ("heapers"), searching the old debris heaps for small-sized blocks, to make dampcourse slates; this activity commenced c.1900, and previous to that date, all blocks under 14" long had been rejected.

2. Maintenance and service workers. This class included smiths, fitters, engine drivers (the "black gang"), hauliers, banksmen, tippers, carpenters, stone-masons, miners and bad-rock men (development workers) and general labourers.

3. Administration staff and management. The staff at Dorothea consisted of a quarry manager, two under-managers, several foremen, slate inspectors, and clerks, plus the shipping agent and his clerks at the head office in Caernarfon.

The first available wages ledger lists 197 workmen in 1857 and excluding the quarry management (consisting of about 4 or 5 persons), the workforce can be divided into the categories described above, viz:

1. Production - 124 (including 37 rubbishers)
2. Maintenance and service - 73 (including 42 contracted "rubbishmen", and 31 day-men, of whom 27 were winding-engine drivers, 2 carpenters, and 1 stone-mason. The percentage non-productive labour was 37 per cent.⁵

By 1890, the workforce at Dorothea averaged 533 over the 13 'months' (of exactly four weeks duration). At that date, the distribution was:

1. Production - 352 (129 rubbishers)
2. Maintenance and service - 181, subdivided as follows: rubbishmen (labourers) 97; contractors (9); day-men (61); others (14). The percentage unproductive labour remained relatively constant, at 34 per cent, because the rise in the number of engine drivers and the "black-gang", etc., had been matched by an increase in the number of 'bargainers'.⁶

The distribution of workers within the various departments of the quarry in August 1894 was as follows:

Pit.	Bargainmen (in pit).	Labourers (Rubbishmen).	Banksmen.	Engine drivers.	Hauliers.	Tipplers.	Others.
A	27 (9 bargains)	12	6	3	} 4	2	1
B	48 (10 " , some double)	16	8	3		4	2
C	156 (34 bargains, some double)	18	7	2	5	4	2
E	12 (development work)	4	1	1	1	2	0

Twenty-two bargains were double units, with two crews amalgamated to combat difficulties in extracting the slate. In addition to the 351 workers listed above, there were 162 slatemakers (two per bargain), and an unknown number of rubbishers. The remainder of the labour force (1890 figures quoted) were: general labourers 26; weighers 4; 2 stock-yard loaders, and one each of mason, fitter, miner and pumper. The estimated grand total is 554 employees, excluding blacksmiths; the latter were employed under some form of contract, and the number varied from 3 to 5, in the nineteenth century⁷.

By 1959, the amount of non-productive labour had increased to 47 per cent because of the reduction in the scale of quarrying. The number of production workers had been reduced to only 38, being composed of 15 'rockmen' and 23 slatemakers. Although the number of non-productive workers had been constantly reduced, there were 34 then in this category in 1959, and this represented the minimum number required to maintain the essential quarry services⁸.

Although there was a small natural turnover of employees during periods of boom, in addition to the variations due to recessions, the Dorothea Quarry was noted for the continuity of employment through several generations of workers, and many men spent their entire working lives at Dorothea. The main reasons for this were security of employment and good earning prospects for the 'bargainer'. The first was of special importance because the piece-work contractors were only for four weeks duration, and not automatically renewable. In small quarries, and those having proprietors with insecure finances, the risk of being dismissed without warning was greater than at Dorothea, where the stable financial base of the Company ensured that the full complement of 'bargains' could be maintained even during temporary periods of recession. The subject of pay is very complex, due to the large number of grades of workers, and the inbuilt disparity of earnings in the bargaining system. However, the excellent quality of the slate rock at Dorothea meant that a gang of competent quarrymen had a better chance of earning a good wage at that quarry than at almost any other in the Nantlle Valley. The position with men paid by the day was different; their wage rate was comparable to the other Nantlle quarries, though not identical, with some classes above the norm and others below⁹.

In terms of safety, the Dorothea Quarry did not fare very well. A large number of minor injuries, eg, lacerations and bruised limbs, was normal in all slate quarries. However, 58 fatalities were recorded for the period 1883-1924, and the total pre-1883 is not known (though 5 men are known to have been killed in one accident in 1858)¹⁰. Apart from one major accident

in December 1884, when 7 men were killed, the average remained at one per year even after the introduction of the safety legislation in 1894 (which set up the inspectorate of mines and quarries). The death rate at Dorothea was significantly higher than at the other Nantlle quarries in the period 1883-92. Analysis of the fatalities reveals that 51 per cent were caused by falling rocks and 20 per cent due to men falling off ledges. Those in the first category may have resulted from inadequate inspection of the high rockfaces for loose pieces, but the second category was purely accidental or due to the workmen's negligence, as were the two fatalities due to a blasting mishap. The types and numbers of fatal accident 1883-1924 are thus:

Men struck by falling stones	20 (51.3 per cent)
Men falling off ledges	8 (20.5 per cent)
Blasting mishaps	2 (5.1 per cent)
Winding gear failure	2 (5.1 per cent)
Natural causes	2 (5.1 per cent)
Manslaughter (accidental)	1 (2.6 per cent)
Unspecified causes (pre-1892)	4 (10.2 per cent). ¹¹

Only two fatalities have occurred since 1924: one in the 1940s and the other in the 1960s, both being due to falls off ledges. The majority of deaths were in the 1880s and 1890s, prior to the introduction of safety legislation. After the setting up of minimum safety standards in the Mines and Quarries Act, 1894, the overall position improved within the slate industry, and the Dorothea Quarry maintained a reasonably good record. Working faces were inspected daily, and a safety gang was sent to remove dangerous loose rock when required¹³.

The subject of working conditions is difficult to discuss because such matters are relative to the norm of the period. Apart from the safety aspect discussed above, health and welfare are probably the most important sociological subjects. Slate quarrying has always been an arduous occupation, even after the introduction of machinery. The working faces at open quarries were exposed to the savages of the climate, of which the heavy rainfall was the most important element. Thus, the outside workers frequently spent the whole day in wet clothes, their only protection being old sacks tied over the shoulders of their long overcoats. Additionally, handling cold iron tools and cold rock gave arthritis and rheumatism to both pit workers and the slatemakers in the mill. The latter might be thought of as fortunate by virtue of working indoors. However, the transference of slatemaking from open huts ("waliau") to mills in the late nineteenth century resulted in an increase in bronchial diseases, especially tuberculosis and silicosis (a form of pneumoconiosis)¹³. Mechanical sawing generated a large amount of very fine silica dust, much of which is invisible. Due to the confined nature of the mill building, this dust was not dispersed, and the slatemakers worked in this atmosphere throughout the day. The result was a build-up of dust within the lungs, leading to shortness of breath, bronchitis, and a greater strain on the heart. The Workmen's Compensation Act of 1898 did not recognise silicosis as an industrial disease despite the high mortality attributed to this condition.

General practitioners were reluctant to ascribe deaths to silicosis, and the quarry proprietors adamantly refuted the suggestion that dust could kill. Discussions on this subject commenced c. 1893 and claims and counter-

claims appeared in several reports over the following four decades¹⁴. In the 1930s, the quarrymen's union selected two men from the Dorothea workforce to present a test-case against their employer for disability compensation. The plaintiffs were awarded the judgement by the Court of Appeal (after being defeated in the High Court), but the decision was overruled by the House of Lords on a point of law¹⁵. However, after an investigation by the Welsh National Memorial Association of 85 Ffestiniog quarrymen, in 1939, slate-mining was included in the Workers' Compensation Act, and further examination in 1944 led to the inclusion of slate-mill workers (in 1946)¹⁶. The benefit derived from these measures was minimal, and the union continued in its campaign for better compensation. A new settlement was achieved in 1979, largely due to political expediency by a minority Labour government, but this was also of limited and dubious value.

The working conditions at slate quarries changed little from the nineteenth to the mid-twentieth century. The only facilities offered by employers were eating-rooms ("cabans"). At smaller quarries, such as Dorothea, the workers congregated at a number of scattered locations for their lunch hour. Favourite spots on the surface were engine-rooms and working places, whilst the pit-men had huts at the quarry bottom; these doubled as shelters during blasting. The Dorothea management provided a new eating-room seating about 200 in 1907, but this was poorly attended due to an innate conservatism in the workforce¹⁷. However, this situation changed after 1919 due to the younger men having experienced communal eating during their service in the armed forces. After 1946, a full canteen service was offered, but this was discontinued within a

short time because the men did not want a heavy mid-day meal¹⁸. Other improvements in this period were an attempt at heating the mill, and the introduction of suction fans for dust extraction.

Industrial relations at Dorothea.

The Dorothea Quarry escaped most of the unrest which disrupted the Caernarfonshire slate industry in the nineteenth and early twentieth centuries, largely because of enlightened management. However, the first recorded strike at the quarry, in January 1857, had much to do with anti-management feeling. The original (1848) concept of a partial workers' co-operative (ie, a company with a significant workers' shareholding) had disintegrated, and by the mid-1850s, the Company was controlled by Rev. J. Jones' sons, John and Thomas Lloyd Jones. The former was a very ambitious man, and a noted speculator, and had clashed with the original quarrymen shareholders in the early 1850s; this episode had directly resulted in many of the latter selling out of the Company. In 1857, John Lloyd Jones used the trade recession and relatively high royalty to reduce the day-rate, and halve the 'bargainers'' poundage. This meant a large reduction in wages, and this, plus the unpopularity of J. Lloyd Jones, prompted a strike. The circumstances are mysterious, but the men gave up after only one week, and accepted the cuts, probably because the management threatened to dismiss all the strikers and replace them from an ample pool of unemployed quarrymen in the neighbourhood during such a period of depression who would be ready to take up employment at any price¹⁹.

After this incident, there is no record of a dispute at the Dorothea Quarry for over 40 years. The credit must go to the enlightened management of John J. Evans (1865-74, 1894-1900), O.T. Owen (1875-1893) and the chairman, John Hughes Williams (1860-79). J. J. Evans and J. H. Williams were especially revered as being fair, though strict, men, and O.T. Owen was hailed as the saviour of the quarrymen's livelihood after saving the quarry from the flooding disaster in 1884-5 (see Part IIIA)²⁰. The first serious clash between management and workers at Dorothea occurred in 1889, when a general wage reduction was implemented throughout the slate industry, in consequence of the 12½ per cent decrease in the market prices. Although the Dorothea manager proposed to carry out the reduction in stages, the men rejected the idea completely, and in a mass meeting held at Pen-y-groes in April 1899, the Dorothea men resolved to join the Quarrymen's Union en masse. However, the following day, a lunchtime mass meeting resolved to recommence working, pending the outcome of discussions between a delegation and the quarry manager. These talks resulted in the acceptance of the cuts, after the financial position had been explained, and in addition, a negotiating procedure was set up, whereby the right of the workers' delegation to have access to the manager for the discussion of grievances was recognised, whilst the latter undertook to inform the former of any relevant company decision two weeks in advance of the date of implementation²¹.

The consultative committee became the standard means of expressing grievances, and was successful in averting possible trouble, for example in July 1901, the men requested a 5s. 6d. day-rate for quarrymen, with corresponding increases for other classes, and during talks, the manager showed that the average rate was already at this level, and a second proposal for deducting Union dues at the quarry office was rejected on legal grounds. Again, in 1905, the examination of the quarry books by the quarrymen's delegates showed the

justification of a proposed 6 per cent wage reduction (due to a $35\frac{1}{2}$ per cent reduction in prices since the last wage cut in 1904) and averted a strike. Nevertheless, the system broke down on at least four occasions. The first was in February 1903, when the manager closed down an eating room after horseplay by some young men. The whole of the workforce reacted by leaving the quarry, but returned the following day, sending a deputation to see the manager. The latter was very annoyed at such indiscipline, but a code of behaviour was quickly formulated, and work resumed in the afternoon. The other three known incidents when the official procedure was not carried out involved the labourers at Quarry C. This group of men walked out for three days in February 1908, protesting at a $2\frac{1}{2}$ d per day cut in wages, but the terms were quickly accepted, probably because no other section of the workforce joined them. The labourers' second strike was on 21 May, 1913, for an extra $1/8$ d. per ton on their rate of $2-3/8$ d. After investigating the claim, the manager recommended his directors to grant the increase, but he was highly critical of these tactics, which affected other workers at the pit. These labourers went on strike for the third time on 12 August 1919, wanting an advance to $6s. 6d.$ per day. Again, the consultative committee was snubbed, but no further details are known²².

After 1918, the Quarrymen's Union was officially recognised, and negotiated wage levels directly with the Owner's Association. A minimum wage was agreed, and a relationship between wages and market value of slates. Consequently, wages rose in the trade boom of 1918-20, but from 1921-2 the industry entered a recession, and prices fell. The owners proposed a wage reduction, and the cancellation of the charter

formulated in 1918, but negotiations broke down, resulting in a forlorn strike at all quarries, from 12-26 June 1922, after which the Union capitulated unconditionally²³. The great depression of 1928-32 resulted in the Dorothea Quarry asking its workers to accept a 5 per cent wage reduction, but this was refused. The matter was taken to arbitration, and resulted in an even greater reduction²⁴.

The last major incidence of industrial unrest at Dorothea occurred in June 1949. Out of 46 slatemakers, 23 stopped working, demanding an increase in their average day-rate. They acted against the advice of their Union representative, who pointed out that their earnings were above the rate agreed between the Union and the employers' association. Fourteen of the strikers returned on 18 July 1949, but the remainder found alternative employment, thus further depleting the already dwindling nucleus of skilled workers²⁵.

Social conditions of the Dorothea workforce.

Few of the Dorothea quarrymen lived in Company houses. The Dorothea Company owned eight houses in the village of Tal-y-sarn ("Pant-du terrace", now Nos. 60-68 Hyfrydle Road) and three ("Foundary terrace") in the hamlet of Tal-y-sarn Uchaf, adjacent to the Quarry. In addition, twelve houses had been built at Tre-grwyn Farm, some quarter-mile southwest of Dorothea, but this property was sold to the Tal-y-sarn Hall estate in 1873²⁶. The majority of the Dorothea workmen lived in the villages of Tal-y-sarn, Pen-y-groes, Nantlle, Llanllyfni, Carmel, Groeslon, and Cesarea, within a four-mile radius of the works. Many were freeholders, but the majority rented houses from the numerous agricultural estates in the area. A significant section of the local population lived on small-holdings,

which served to supplement the quarry wage with a measure of self-sufficiency, but it is not possible to comment on the distribution of Dorothea workmen into these categories because such information is non-existent. Census returns do not identify the place of work, and no complete list of Dorothea quarrymen exists, but it is possible to state that the majority of workers at the quarry in the 1820s-50s lived on small-holdings, because the development of the quarrying villages (especially Tal-y-sarn) did not commence until the 1860s²⁷.

A case-study of the growth and decline of the community in the village of Tal-y-sarn will illustrate the general conditions in the other quarrying villages within the Nantlle area. It is not possible to quote population figures for Tal-y-sarn (these not being separately available), but reference to old maps and census returns shows the trend of development. Prior to the industrialisation of the area, there existed a number of farmhouses and small cottages scattered thinly. In the initial phase of development (which was small-scale), a small number of terraces were erected close to the main quarrying area, (eg Foundry terrace, No.30, Figure 12). However, the population increased dramatically after 1850, and housebuilding commenced on a larger scale. The new site was west of the old centre, outside the quarrying area (Figure 1). Although the land was almost solely owned by the Coedmadog estate, there was little or no planning of the village. Plots of land were let to individuals to build single houses or terraces (for sub-letting) and the buildings themselves were built to individual design. However, the majority of workers houses were of the 'two-up, two-down' variety, with an external lean-to kitchen, and outside toilet.

Mains drainage was not provided until the early twentieth century, and raw sewage was being discharged into the River Llyfnwy as late as 1972-3. In the early 1970s a comprehensive scheme was carried out, providing the whole valley with new mains drainage and a treatment plant. In addition, the old domestic water-supply system (which had served since 1896) was refurbished. New mains were laid throughout the area served by the Cwm Dulyn reservoir (located on the slopes of Craiglas, Figure 1). The gas supply system was modified in the late 1960s, when the national grid was established, to consume natural gas from the North Sea. Previously, the villages of Llanllyfni, Nantlle, Pen-y-groes, and Tal-y-sarn were supplied with coal-gas from the Nantlle Vale Gas Works, at Tal-y-sarn. This had been built in the 1870s by a private company, and the directors included John J. Evans, manager of Dorothea Quarry. Electricity was available at Nantlle village in 1906, when the Pen-yr-orsedd Quarry was connected to the North Wales Power and Traction Company's grid. However, the remainder of the valley was not provided with electric power until the late 1930s²⁸.

The commercial life of Tal-y-sarn fluctuated in phase with the fortunes of the quarrying industry. It is not possible to chart the growth of commerce because the majority of trade and postal directories only list the larger businesses. The most complete account of the commercial life of the village is the Postal Directory of Carnarvonshire (Liverpool 1886). The entry for Tal-y-sarn reveals the following groups, a small elite serving a community of probably up to ten thousand people;

<u>Group</u>	<u>Number of persons</u>
Slate trade	15
Other trades and professions	27
Shopkeepers	43
Others	6

The first category, relating to persons engaged in slate quarrying, names all the important higher managers and proprietors residing in the village. The most important were John Robinson, of Tal-y-sarn Hall (proprietor of the Tal-y-sarn Quarry); his son, Thomas Robinson, of Tan-yr-allt Hall (manager of Tan-yr-allt Quarry); and O.T. Owen, of Dorothea House (manager of Dorothea Quarry). In addition, several of the middle management (clerks and slate inspectors) are listed. However, it seems likely on other evidence that these represent only a small sample of this class of employee, and it is difficult to comprehend the criteria for their inclusion. It is presumed that the two persons labelled "quarrymen" were proprietors of small quarries.

The second group, "other trades and professions", contains the usual assortment of middle-class people, a professional element which included a schoolmaster, two doctors, three ministers, an accountant, station master, and a policeman. The tradesmen included three blacksmiths, two stone-masons, a joiner and two publicans (The "Machine Tavern", Tal-y-sarn, and the "Commercial Inn", near Dorothea, had closed by this date). Of special interest is the emigration agent, who was very busy during the trade depression of the early 1880s.

The third category can be sub-divided into two - "general" and "specialised" shopkeepers. The first consisted of 19 small grocery storekeepers, whose establishments varied in size from a typical 'corner-shop' to the front-room of a small terrace house. Many of these proprietors were quarrymen, whose wives managed the business during the day-time. "Specialised shopkeepers" were those other than ordinary grocers. This category contained three butchers (each having a private slaughterhouse), three greengrocers, two smallware dealers (underwear), two drapers, three glass and china dealers, a chemist, newsagent, a confectioner, and three coal and lime merchants. The larger emporiums are also included, viz: "Manchester House", the Post Office, "Bod Hyfryd", and "Penllwyn House". These sold a variety of goods, ranging from grocery to ironmongery and drapery. These shops had several employees, including persons delivering goods with a pony-and-trap. The proprietors of these stores (John Edwards, Owen Jones, Thomas Elias Jones, and Rowland Williams, respectively) were relatively important members of the society since some of them were chapel elders as well.

Similarly, the persons included in the final category, the "unclassified", must have been socially important. No details are known about these individuals, but their residences, which still exist, were the largest houses in the village (eg "Plas Coedmadog", "Fron Haul", and "Snowdon View").

The decline in the commercial life of Tal-y-sarn started in the early twentieth century, with the 1903-10 recession in the slate industry. This has been accelerated in recent years by competition from

supermarkets at Caernarfon and Bangor, and the author has witnessed the disappearance of three butchers shops, two hardware shops, three general stores, one newsagent, two car-repair shops and a chip shop, within the last 15 years.

The social life of Tal-y-sarn used to be concentrated on the chapels. Religion had been firmly founded in Wales by the 1850s, and it is not surprising that the village contains several places of worship. The Calvinistic Methodist (Presbyterian) cause was established as far back as the 1780s, but the first chapel was not built until the early nineteenth century. It was to this chapel that the Rev. John Jones came as minister in 1823, and of which many of the originators of the Dorothea Slate Company (1848) were members. This site is now covered by slate tips, a new chapel (Tal-y-sarn MC) having been erected in 1857 on a new site further west. From this, several branches were established, one being "Hyfrydle" (1865) at the western end of the village.

The Independents established their cause, c.1820, in an old factory, but were also obliged to move west due to the encroachment of the quarries. A new chapel, "Seion", was erected in 1861 in the village centre. The Baptists were smaller in numbers than the other denominations, and frequented a chapel at Llanllyfni until 1862, when "Tabernacl" was erected at Tal-y-sarn. Twenty years later, a new large building was erected ("Salem", 1884) and the old chapel sold to the Wesleyans, and renamed "Moriah". The latter was the first to close, in the 1950s,

followed by "Bethania", which was a small meeting-hall erected by a breakaway faction of the Baptists.

The Established Church was slower to meet the spiritual needs of new agglomerations of people and was represented by a small church, "St. Ioan", built in 1869. Previously, the closest church to Tal-y-sarn was the parish church at Llanllyfni, a distance of about two miles²⁹.

Apart from the normal range of services, both on Sundays and other weekdays, the religious establishments offered more secular entertainment in the form of literary clubs and concerts. In addition, the Methodists erected and maintained a concern hall, the "Assembly Rooms", which was used for staging dramas, operas, concerts and magic-lantern shows. Many of the concerts were staged to raise money for incapacitated quarrymen and their families. In such charity concerts, the artists gave their services free of charge. Often more tickets would be sold than the maximum seating capacity because people wished to contribute regardless of whether they wished to attend the concert.

The community could draw on a variety of local talent to appear in such concerts. In the 1920s, for instance, Tal-y-sarn had a very popular drama company, performing mostly the output of its leader, the novelist W.J.F. Davies, of Tal-y-sarn. In the same period, the valley had an opera company directed by Mr. Tom Williams, Onllwyn, Tal-y-sarn (formerly of Portmadog). Another favourite was the Nantlle Vale Royal Silver

Band. This had been founded in the 1860s, and by the 1890s, had risen to the top British championship standards, and competed at the Crystal Palace, London, on several occasions. However, after the tragic accidental death of their trainer, J. Hughes Evans ("Johnny Miss") in the 1920s, the band never regained such a high standard, and gradually declined. Other groups active in this period were a small orchestra, three quarry male voice choirs (conducted by three brothers), a mixed voice choir and a very successful children's choir based at the hamlet of Tan'rallt. In addition, the village produced several solo artists, and the whole valley contained a plethora of various talents.

The effect of a busy, amateur intellectual society was to generate a number of exceptionally gifted people. When such talent was spotted, the whole community united to propagate it, by providing finance and moral support, eg, for college fees, etc. Examples of such people are R. Williams Parry, Mathonwy Hughes, Gwilym R. Jones in the literary field; R. Silyn Roberts, preacher, Independent Labour Party activist and proponent of the WEA; and Mary King Sarah, a very successful operatic star of the 1920s³⁰.

(ii) THE LOCAL MANAGEMENT.

The social position of the management of the Dorothea Quarry has passed through four distinct phases, whilst the technical structure of the system was continually modified to suit the prevailing circumstances. The management structure always consisted of two distinct levels: 1. the proprietors, who are discussed in the next sub-section; and 2. the local management, responsible for the day-to-day running of the quarry. Within the second category, there was also a hierarchy, eg, at the peak of development, Dorothea had a works manager, two under-managers (supervising two pits each), foremen-cum-timekeepers, and various grades of clerks and slate inspectors. The system was even more complex after the acquisition of Quarries E, F and G, as each had its own management sub-structure. By 1939, the system had been rationalised, due to the reduction in the scale of working, and the prestige and power of the management was reduced by virtue of the directors becoming more actively involved in the running of the quarry.

In the early and mid-nineteenth century, management posts were allotted by a system of patronage and nepotism. All of the Dorothea managers serving Messrs. Turner and Morgan, 1829-48, had some prior connection with William Turner, for example, Thomas Edwards, Taldrwst farm, Llanllyfni, had a family connection with Turner, and was at some date the manager of the latter's quarry at Diphwys, Ffestiniog³¹, and Robert William Rowlands had been Turner's manager at the Pen-y-bryn Quarry, in the early 1800s³³.

The "Welsh Company", which acquired the Dorothea lease in 1848, was probably unique in that the quarry manager, and an executive committee were elected by ballot of the shareholders. The first manager was William Owen, Hafodlas, Tal-y-sarn, one of the originators of the Company, but he resigned in 1851, following a disagreement with a faction within the company. His successor, Rev. John Jones, Tal-y-sarn, was also elected. However, this practice had ended by 1854, when the latter was succeeded by John Robyns, another of the original quarrymen shareholders³⁴. In this early period it appears that there was only a single manager at the quarry, aided by one clerk.

The rapid development of the Dorothea Quarry after the mid-1860s can be directly attributed to John J. Evans, who was appointed quarry manager in 1865. J. J. Evans turned a marginal break-even trading account into a five-figure profit within ten years, and in so doing elevated the social position of his post. The old agent's house (on the quarry bank), built in the 1830s, was replaced by a large residence set apart from the quarry, but within easy walking distance. This house ("Dorothea House") was of equal size to the residences of the proprietors of Dorothea's largest competitors (Pen-yr-orsedd and Tal-y-sarn), though the last two properties (Plas Baladeulyn and Tal-y-sarn Hall, respectively) were later greatly extended.

The standard of person eligible for consideration to the post of Dorothea manager in the late nineteenth century is illustrated by the case of Owen Thomas Owen. He was the chief clerk at the quarry office in the early 1870s, and was promoted above the two sub-managers, to

succeed J.J. Evans, who departed for the Penrhyn Quarry in 1874. It is said that O.T. Owen was recommended by J.J. Evans because of his genius qualities, which were graphically displayed during the flooding disaster of 1884-5. However, the strain of the responsibility imposed on the manager, due to the lack of quarrying experience by the proprietors, was too much for O.T. Owen, and by the early 1890s, he had become a chronic alcoholic. Despite an attempt at rehabilitation, financed by the company, he suffered a relapse, and was dismissed in February 1892. The post was advertised, and about 30 applications were received, including those of the two sub-managers. However, none was deemed suitable, and an effort was made to persuade J.J. Evans to return, though at a reduced salary. Evans had been dismissed from Penrhyn in 1882, and although unemployed, would not consider the reduced terms. Therefore, O.T. Owen was reinstated, after pledging total abstinence, but within a year, he had died of liver failure, aged only 49 years. In desperation, the directors offered J.J. Evans his old salary, and the latter returned for a second term, serving until his death in 1900³⁵.

Information about the sub-managers in the mid-nineteenth century is scanty, but after 1890, it is possible to trace the careers of all the quarry staff. It appears that the status of the Dorothea sub-managers was on a par with the workers managers of the majority of Nantlle quarries, and several of the former were promoted to their position at Dorothea from being full managers of other quarries. However, there was also a movement in the opposite direction, for example Owen Hughes, who was apparently disappointed at not being appointed to succeed O.T. Owen,

left to become the manager of Coedmadog Quarry, Nantlle, in 1896, but was sacked in 1908³⁶, and William Morris Jones was lured to the Alexandra Quarry, Rhosgadfan in 1907, for a higher salary, but was out of work when that quarry closed in 1914³⁷. Notes on the applications received for two sub-managers posts at Dorothea in 1901 and 1907 show that the main criteria were a good education and impeccable character, and in one case the works manager successfully opposed the candidate favoured by the managing director³⁸.

The majority of the Dorothea sub-managers were 'outsiders', having had some managerial experience elsewhere. This was the case with J.J. Evans' second protege, William John Griffiths, who replaced Owen Hughes as sub-manager in 1896. He was appointed to succeed J.J. Evans in 1901, and served the company in this capacity for 34 years. He was the last of the outstanding personalities, and after his death, in March 1935, the prestige of the post diminished. The new manager, Owen Giller, despite enjoying nearly the same autonomy as his predecessor, did not command the same degree of respect as W.J. Griffiths and J.J. Evans, who were important leaders of society, held in awe by the local population. O. Giller and his successors, H.H. Jones (1945-64) and W.F. Flemming (1964-70) were merely works managers, rather than the paternalistic god-like figures of the old managers³⁹.

In contrast to the managers, the remainder of the quarry staff was usually appointed from within the work-force. This class of employee included clerks and slate inspectors. Sociologically, there was a class division between the senior clerks and slate inspectors and the

remainder of the workforce, and there was probably more antagonism between the latter and the inspectors than with the management, due to power of the inspectors to reject the produce of the quarrymen on the grounds of quality control. Within the community, the difference between this middle management and the ordinary quarrymen was expressed more in social behaviour than in materialistic terms, though the former tended to reside in better and larger houses within the terraces⁴⁰.

(iii) THE PROPRIETORS.

The landlords of the Dorothea property are excluded from this discussion because they had little contact with the quarry, apart from enjoying about £800 per annum in royalties from the 1860s onwards. This sub-section discusses the persons who invested in the enterprise, and had ultimate responsibility for its fate.

The first important proprietor of the Dorothea Quarry was William Turner, of Ffestiniog, and later of Caernarfon. His career as an entrepreneur has been discussed in Part III, and apart from that account, little is known about his private life. It may be safely assumed that between his responsibilities at Dinorwic, Llanberis, Dorothea, and Diphwys, Ffestiniog, W. Turner led a busy life, and had to delegate much authority to the works managers. This would also have been the case with the second dominating figure in the history of the quarry, John Lloyd Jones. He became chairman of the Dorothea Slate Company by proxy c. 1854, but left most of the work of management to his brother, Thomas Lloyd Jones, and to the agent, John Robyns. J. Lloyd Jones was also involved with several other speculative concerns in the 1850s and 1860s, but seems to have retired by the 1870s, having amassed sufficient funds to pay for an imposing new residence, Plas-y-bryn, Bontnewydd, a fashionable "green-belt" area outside Caernarfon⁴¹.

J. Lloyd Jones broke his connection with Dorothea in 1860, selling out to his brother-in-law, John Hughes Williams, late of Plas-yn-blaenau (sic), Llangernyw, Denbighshire. The latter rented Ty Coch, Caernarfon (later Plas Coch) for a few years, before moving to a large residence

Glanbeuno, Bontnewydd, c.1863⁴². J.H.Williams was a civil engineer by profession, and had worked on the development of railways in America, in the 1840s⁴³. It is not possible to gauge his exact involvement in the administration of the Dorothea Quarry, but it is probable that he took an active interest, and definitely had the ultimate decision over policies and schemes proposed by the quarry manager. The shipping side of the business was run by his brother-in-law, Cornelius Davies, of Caernarfon, formerly the agent of a coal mine at Mold, Flintshire).

After the death of J.H.Williams in March 1879, aged 69 years, his Dorothea interest was administered by trustees until the coming of age of his children (see Part III above). From 1890, the chairman of the company (and managing director, after 1893) was the eldest son, John Albert Alexander Williams. His coming of age, in March 1884, had been an event of great celebration both at Caernarfon and Nantlle, and the festivities had included processions, speeches, and a dinner for the Dorothea quarrymen in the new slate mill⁴⁵. Much had been expected from this young man, but he was of a different character to his father. J.A.A.Williams was rarely seen at the quarry, and in the 1890s, he moved from his residence at Glangwna, Caeathraw, Caernarfon, to Plas Aberglaslyn, Beddgelert. This became a summer retreat, and for most of the year he resided in London, being actively involved in high society, which included entertaining royalty⁴⁶.

J.A.A.Williams had little interest in the Dorothea Quarry except as a source of income; however, he strongly resisted attempts by his brother and sisters to gain control of their portion of their late father's shareholding. Fortunately, he was unsuccessful, and the influence of Arthur Wynne Williams, aided by his sisters, Anita and Evelina, was an important factor in keeping control of the quarry within the family (see Part III above). J.A.A.Williams sold out his holding in 1911, and remained in London until a short period before his death, in 1945, when he returned to Caeathraw. Both sisters had married by the 1890s, and were residing in England, while the youngest son, Ivor Hedd Glynne Williams was in a mental institution and died in 1915⁴⁷.

Control of the Dorothea Company was in the hands of Arthur Wynne Williams from 1911-47. He resided at Bodwyn, Llanrug, near Caernarfon, and combined his duties as managing director with his interest as a gentleman farmer and horse-breeder. His two sons travelled widely, and were engaged in several varied business activities before returning to take over the family business. The eldest, John George Wynne Williams, went to work for the East Africa Company, at Zanzibaar, in 1913, and joined the East African Rifles upon the outbreak of war in 1914, attaining the rank of Lt.Colonel. After the war, he started a newspaper in East Africa, but returned to Wales in the 1920s, being articled to a Caernarfon solicitor. J.G.Wynne Williams gave up his career, and became involved with the Dorothea Quarry, assisting his father, and succeeding him in 1947. He was managing director for only 11 years, and died suddenly in 1958.

A.W. Williams' second son, Arthur Ivor Wynne Williams (born c. 1900) was also involved in the First World War, attaining the rank of Major before being seriously wounded. After 1918, he attended university, read mechanical engineering, and followed this profession until 1939 before entering rocket research in Britain and Australia during and after the Second World War. Upon his return to the United Kingdom, he joined the family business, succeeding his brother as managing director in 1958, a post he held until his death in 1968. The youngest member of the family involved in the Dorothea Company was J.G.W. Williams' son, Mr. Michael John Barnard Wynne Williams. After serving in the army during the Second World War, Mr. Williams was articled to a Caernarfon solicitor, but upon the death of his father, he was obliged to give up his studies, to assist his uncle to run the quarry. He was joint managing director from 1961, and sole managing director after 1968⁴⁸.

PART IV NOTES

1. Dorothea MSS 676, 911.
2. *ibid.*, MSS 562-3, 1401, 1473, 1480.
3. Table compiled from: "Traethawd ar Chwarelwyr Nant Nantlle", published in Blagur Llyfnwy, ed. W. R. Ambrose (Caernarfon 1864); J. O. Griffiths, Traethawd ar Lechfeini Sir Gaernarfon (Tremadog 1864); Gwynedd Archives, MSS 392; D. C. Davies, A Treatise on Slate and Slate Quarrying (London 1878); Dorothea MSS 1265; D. Dylan Pritchard, Articles in the Herald Cymraeg, February 1938; The Welsh Slate Industry, Report by the Committee appointed by the Minister of Works (H.M.S.O. 1947); author's estimates; W. J. Parry, Chwareli a Chwarelwyr (Caernarvon 1897).
4. J. Lindsay, History of the North Wales Slate Industry (Newton Abbott 1974) pp. 231-2.
5. Dorothea MS 676.
6. *ibid.*, MSS 672-3.
7. *ibid.*, MS 1254; ex.info.Mr. G. Roberts.
8. Dorothea MSS 1473, 1480.
9. *ibid.*, MS 1488, cutting from the Carnarvon and Denbigh Herald, March 1884.
10. *ibid.*, cutting dated 1858; MSS 562-3.
11. *ibid.*, Report of the Royal Quarry Committee of Enquiry 1893. Appendix II, Table Ic.
12. Dorothea MSS 562-3, 2119.
13. J. Lindsay, *op.cit.*, pp. 234-6.

14. loc.cit.
15. ex.info.Mr. O. Humphries.
16. J. Lindsay, op.cit., p.236-7.
17. loc.cit.
18. Dorothea MS 1488, newspaper cutting from Liverpool Daily Post, 24, June 1948.
19. ibid., MS 926.
20. ibid., MS 1488, cutting from Carnarvon and Denbigh Herald, March 1884.
21. ibid., cutting dated 1899; MS 5.
22. ibid., MSS 880, p.185; 885, letter dated 12 August, 1919.
23. J. Lindsay, op.cit., pp.284-5.
24. ibid., p.286.
25. Dorothea MS 1454; ex info Mr. O. Humphries (union branch secretary).
26. Dorothea MS 5.
27. Census returns for the parishes of Llanllyfni and Llanwnda, 1871.
28. loc.cit; ex info a number of older inhabitants of Tal-y-sarn.
29. Rev.Gwynfryn Richards, Dathlu Canmlwyddiant Eglwys St. Joan, Tal-y-sarn (pamphlet, 1972), pp.10, 14-15.
30. ex.info.Mr. O. Humphries.

31. J. Griffiths, Chwarelau Dyffryn Nantlle a Chyndagaeth Moeltryfan
(Conway, 1934), p.28.
32. op.cit., p.57.
33. R. Williams, Hunangofiant Chwarelwr, Cymru, 1900.
34. J. Griffiths, op.cit., p.33, but Dorothea MS 1, Minute Book does
not record this appointment.
35. Dorothea MS 1945, pp.1-22.
36. ibid., MS 2108; Herald Cymraeg, December 1908.
37. Dorothea MS 2108.
38. ibid., MS 880, letter dated 7 January, 1902.
39. ex.info. former quarrymen.
40. loc.cit; Dorothea MS 2108.
41. ex.info. Mr. M. J. B. Wynne Williams.
42. Dorothea MS 5.
43. ex.info. Mr. M. J. B. Wynne Williams.
44. Dorothea MS 2108.
45. ibid., MS 1488, cutting from Carnarvon and Denbigh Herald, March 1884.
46. ibid., MS 5; ex.info. Mr. M. J. B. Wynne Williams.
47. ibid., Dorothea MS 5.
48. ex.info. Mr. M. J. B. Wynne Williams.

CONCLUSION

Despite the major disadvantages imposed by its location and the terrain, the Dorothea Slate Quarry was the most productive of the twenty-odd concerns that once operated in the Nantlle Valley. Although Dorothea was a typical example of the deep open-pit method of quarrying found at Nantlle, several aspects of its history place it in a class apart from its neighbours.

The most significant difference was the continuity of working at Dorothea. During its almost unbroken 147-year working life, there were only two major company changes, whilst all the other Nantlle quarries experienced several changes of proprietors - the product of pure speculation. Of even greater significance was the investment of local capital in the Dorothea Slate Quarry Company of 1848. This contained a large proportion of quarrymen-shareholders, and the business was conducted through the medium of the Welsh language. However, the quarrymen's controlling power was short-lived, and by 1860 John Hughes Williams had acquired the majority of the shares. His successors remained in control for four generations, until the cessation of work in 1970.

The golden age of the Dorothea Quarry was from 1865-80, during the period of greatest expansion in the slate industry. However, the credit for the high profitability of the concern must go to the works manager, John J. Evans (during 1864-74, and 1893-1900), who had to contend with a legacy of incompetence left by his predecessors. The most damaging period was from 1884-92 when the new Company chairman, J.A.A. Williams,

sought to impose his will on Evans' successor, O.T. Owen, who was in ill-health. The condition of the workings deteriorated rapidly under the policy of reducing expenditure on development, so as to maximise profits. The result was a chain of events that could not be overtaken by subsequent managers. Massive landslides occurred, diminishing the slate output. The cost of removing the debris was high, and wasted the funds earmarked for development work. The postponement of development work resulted in further landslides, and so on. In addition, the Company was burdened with the extra costs of flood-prevention measures, and capital was required at the Pen-y-bryn Quarry (taken on lease by the Company in 1892). This was to have been a successor for the ailing Dorothea Quarry, but it turned out a dismal failure, wasting a large amount of scarce capital. Once again, the Company was fortunate in its choice of manager. W.J. Griffiths (from 1901-35) was highly talented, and expertly guided the concern through a very difficult period. He was the last of the charismatic nineteenth-century chief working managers, and the prestige of his successors was greatly reduced by the ever-increasing role played by the managing director in the day-to-day affairs of the quarry.

An important feature in the history of the Dorothea Quarry was the evolution of technology. In the nineteenth century the most important changes were mechanical, but in the twentieth century, both machinery and working techniques were modified. The first improvements occurred in winding machinery because this placed a limitation on the rate of production. The first hand-operated winches gave way to horse-powered "whimseys", but these were slow and weak compared to the steam-powered hoists installed after 1843. Initially, the number of steam engines was low, due to the high cost of transporting the coal, but by the 1880s communications had improved, and the number of steam-winches increased rapidly. At its

peak, about 20 fixed steam engines worked at the quarry, plus a number of small locomotives.

The use of water-power was limited to three water-wheels (two for pumping and the third in a mill) due to the scarcity of surface water. Securing an adequate and constant supply was a major problem involving complex agreements with other quarry companies. One outcome of the battles fought over the water issue was the purchase of a mountain corrie (Cwm Silyn), where a private hydro-electric power station was envisaged in 1900. Unfortunately, the original scheme could not proceed, and the Company spent the next 38 years discussing alternatives (namely modified schemes, or a connection to the North Wales Power Company's grid). Eventually, a small oil-powered generator was purchased, powering two motors in the main mill and two small pumps. Due to the centralisation of sawing in one mill, this replaced 5 steam engines. Because of the marked reduction in costs, the large steam pumping engine at Dorothea was replaced by electric pumps in 1952, the extra power being provided by a second generator. Four years later, mains electricity was provided, and the last steam winding engines were converted to electric drive in 1959.

Slate quarrying was a labour-intensive industry, relying heavily on individual skills. Thus, mechanisation had limited applications in the old system of working. The first labour-saving devices available to the ordinary quarryman were pneumatic rock-drills, installed in 1910. Previously, shot-holes had to be laboriously drilled with hand-tools, and

although there were a number of steam-powered drills at the quarry, these were reserved for special development work. After the abolition of the "bargaining" system in 1940 (i.e. the monthly letting of rock faces to gangs of workers), quarrymen became rockmen-labourers, and thus the introduction of new machinery requiring modified working practices was made possible. Due to the economic and political situation, however, re-equipping was confined to the purchase of a few second-hand excavators and dumpers.

New earth-moving machinery was obtained in the early 1960s, and proved successful for development work and clearing debris. To justify the continued use of this plant, a large turnover of material was required, and the Company resorted to blasting down large portions of the rock to provide the required tonnage, but this policy had the deleterious effect of increasing wastage.

On the production side, the first important advance in technology was the introduction of sawing machinery in the 1880s, some 30 years later than at the Ffestiniog quarries, due to the fact that the harder Nantlle slate could be worked without the use of machinery, whilst the softer rock at Ffestiniog proved more difficult. Though the use of saws significantly reduced wastage in all cases, the proprietors at Nantlle were reluctant to install this machinery because of its cost. Eventually, Dorothea was the second Nantlle quarry to install saws, and subsequently all the larger concerns in the area followed suit. Considerations of cost similarly affected the adoption of dressing

machines, though the hard blue slate tended also to be unsuitable for such dressing. Only the softer purple slate was worked at Dorothea after 1908, but these machines were not installed at the Dorothea mills until 1940, the equipment being transferred from the mills of neighbouring quarries taken over by the Company.

Yet, in other respects, Dorothea was very advanced in the industry. An important breakthrough developed at the quarry was the improved saw blade which lasted for 18 months without re-sharpening, compared to the standard blade which lasted only a day or so. Again, electric high-speed sawing was tested in 1939, but abandoned because of technical problems. A second attempt was made in 1964, but then matters of cost again rendered the plant unsuitable for roofing-slate manufacture, and it was thereafter used to produce flooring and wall-cladding material only.

The commercial history after 1848 of Dorothea is well documented, and so the effects of differing managerial and board policies on the finances of a small company are clearly delineated. The single most important feature of the early years was the channelling of excess profits into a Reserve Fund which ensured the viability of the Company on numerous occasions. In the later years, the adverse influence of government policy was very evident, notably in failing to compensate the slate industry for its sacrifices during the Second World War, thus straining Company reserves, and the refusal of the Treasury to grant a loan to Dorothea in 1958-60. The ultimate collapse of the Company can be directly attributed to the reticence of civil servants, who did not understand

the needs of the industry. Having been forced to mortgage its freeholds in 1962-3 to finance the modernisation scheme (for which the loan was required) the Company had no reserves to fall back on when the slate market dwindled due to the economic policies of the Labour Government of the mid-1960s.

The last managing director, Mr. M.J.B. Wynne Williams, had attempted to bring a nineteenth century concern to terms with the economic realities of the mid-twentieth century. Apart from the new plant described above, he introduced several new products, namely flooring 'tiles', wall-cladding, and slate gifts. Unfortunately, the concern was too small to cope with a large degree of diversification, and some of the products were unsuccessful. His greatest error was the setting up of an independent building subsidiary, entrusted to a supposedly expert management. This produced a colossal loss.

Mr. Williams also attempted to persuade the North Wales quarry proprietors to abandon their nineteenth century attitudes towards marketing. Few quarries advertised their product, relying solely on established agencies and their trade reputations. All attempts at setting up a combined marketing agency to combat clay tiles and imported slates had failed before, and despite the massive contraction in the slate trade after the Second World War, the industry, and more particularly the larger concerns, adamantly refused to combine for the common good. Despite this setback, and in the full knowledge that any promotion of Dorothea slate also benefited his competitors, Mr. Williams pursued a constant advertising campaign, and he toured the country in search of new outlets. The success of his efforts can be

gauged from the overflowing order book of the Company in early 1970. It was very unfortunate that the quarry itself could not supply the required quantities of slate. A large amount of capital was required (only available by extending the bank overdraft) to restore the quarry pit and there was no adequate guarantee of regular profitable returns. As a result, in March 1970, the directors decided to recommend that the Dorothea Slate Quarry Company Limited be wound up.

Eleven years after the cessation of work, the site is now deserted and quiet. The pit, which once echoed to the sounds of blasting, is now a deep, still lake, and grass grows inside the roofless buildings. Visitors find it difficult to imagine the busy scenes of just a decade ago, and the same is true of the new generation of children in the local primary schools. Few realise that in days gone by there was intense competition for apprenticeships at "Canaan" - the promised land, as Dorothea was regarded, whilst latterly to be a quarryman became a sign of failure. Dorothea thus appears as only another derelict area, in a valley full of abandoned sites, but to the older generation it represents a part of their lives, for good or evil. As for the future, it is unlikely that slate will ever be quarried at Dorothea again, and it seems equally improbable that a proposed holiday centre development will be granted planning permission. Thus, the buildings will be allowed to decay in peace, and nature will reclaim what man has temporarily borrowed.

APPENDIX I. Table 1 (see Introduction, p.3).

Nantlle Valley Quarries Employment Statistics

<u>Year</u>	<u>No of workmen</u>	<u>No of companies</u>	<u>References</u>
1814	Approx 50	Approx 12	1
1864	1,548	15	2
1878	2,705	18	3
1882	2,509	18	
1883	1,932	17	4
1898	3,101	21	
1913	1,796	16	
1922	1,674	15	
1925	1,709	-	
1928	1,721	13	
1931	845	8	
1934	1,102	9	5
1937	998	11	6
1946	400	5	7
1963	Approx 230	5	
1970	Approx 40	4	
1980	17	4	8

References

1. W.R. Ambrose (ed.). Blagur Llyfhwyr, (Tal-y-sarn, 1864), essay by W. Davies entitled "Traethawd ar Chwarelwyr Nant Nantlle".
2. J.O. Griffiths, Traethawd ar Lechfeini Sir Gaernarfon (Tremadog, 1864).
3. G.A.S. MS 392.
4. W.J. Parry, Chwareli a Chwarelwyr, (Caernarvon, 1897).
5. D. Dylan Pritchard cited these figures in various newspaper articles in 1938, preserved in a scrapbook, Dorothea MS 1488.
6. D. Dylan Pritchard, The Slate Industry of North Wales (Denbigh, 1946).
7. The Welsh Slate Industry (H.M.S.O., 1947).
8. Estimates by the author.

Classification of Nantlle Valley Slate Quarries

1. Producing less than 2000 tons per annum and employing less than 100 men:

Bryn Fferam
Fron (or Uron)
Braich-rydd (or Old Braich)
Gallt-y-fedw (or Victoria)
Gwernoer
Ty Mawr East (or Nantlle Vale)
Ty Mawr West
Ty'n-y-Weirglodd (or Vale, or West Dorothea)
Tan-yr-allt
Singrig (or Dolbebi)
Fronheulog (or New Fronheulog, or Vronlog)
Taldrwst
Tyddyn Agnes (or Tyddyn Annas)
Ty'n-y-Llwyn (or United Quarries)
- Llwyd-coed (or Eureka)
Gelli Bach
Bryn Castell
Foel Uchaf
Cwm Dulyn

2. Producing 2,000-4,000 tons per annum, and employing up to 250 men:

Alexandra (or Cors-y-bryniau)
Moeltryfan
Braich (or Braich-melyn)
Pen-y-bryn (or Cloddfa'r Lon)
South Dorothea (or Cornwall)
Coedmadog (or Gloddfa Glai)
Cloddfa'r Coed (or Hafodlas)

3. Producing 4,000-7,000 tons per annum and employing up to 500 men:
Pen-yr-orsedd
Gilgwyn
Dorothea
Tal-y-sarn

Each category arranged in order of location, reading from north-east (top) to south-west (bottom).

APPENDIX I. Table 3 (see Introduction, p.5).

Employment data for the larger Nantlle Quarries, 1864-1980

Year	1864	1872	1878	1882	1889	1898	1913	1934	1937	1946	1970	1980
Quarry												
Pen-yr-orsedd	400	40	460	261	390	613	459	345	351	180	60	10
Dorothea	400	525	520	533	550	530						
Pen-y-bryn	200	250	300	234	0	90	312					
South Dorothea	-	-	-	70	104	121	100	434	359	136	0	0
Gallt-y-fedw	-	-	-	-	-	99	61					
Moeltryfan	50	-	-	81	150	236	136					
Cilgwyn	200	280	300	300	318	331	174	260	185	128	12	0
Alexandra	12	-	-	195	230	239	195					
Tal-y-sarn	24	300	525	400	360	238	224	0	0	0	0	0
Cloddfa'r Coed	-	-	60	-	150	113	0	0	10	0	0	0
Coedmadog	20	100	30	100	80	158	0	0	0	0	0	0
References	1	2	3	4	5	6	7	8	9	10		11

1. J.O. Griffiths, Traethawd ar Lechfeini Sir Gaernarfon, (Tremadog, 1864).
2. W.R. Ambrose, Hynafiaethau Nant Nantlle, (Tal-y-sarn, 1872).
3. Dorothea MS 392.
4. Government data, cited by W.J. Parry, Chwareli a Chwarelwyr (Caernarvon, 189).
5. J. Griffiths, Chwarelau Dyffryn Nantlle a Chymdogaeth Moeltryfan (Conway, 1934).
6. Cited by D. Dylan Pritchard in newspaper articles, Dorothea MS 1488.
7. North Wales Slate Quarry Owners' Association circular, 1913.
8. D. Dylan Pritchard, op.cit.
9. D. Dylan Pritchard, The Slate Industry of North Wales (Denbigh, 1946).
10. The Welsh Slate Industry (H.M.S.O., 1947).
11. Estimates by the author.

APPENDIX I. Table 4 (see Introduction, p.5). (Dorothea MS 5).

Tonnage of slate dispatched from Nantlle Station, 1882-1913

<u>Year</u>	<u>Total tons</u>	<u>No of dispatchers</u>	<u>Dorothea output</u>	<u>% of total</u>
1882	52,771	12	15,049 t.	28.5
1883	55,376	12	15,994	28.9
1884	56,776	14	16,333	28.8
1885	-	-	-	-
1886	-	-	-	-
1887	52,392	12	14,760	28.2
1888	49,939	9	15,438	30.9
1889	49,637	18	14,583	29.4
1890	45,576	16	14,321	31.4
1891	39,070	13	9,816	25.1
1892	38,818	10	10,117	26.1
1893	37,063	11	10,564	28.5
1894	46,228	11	13,183	28.5
1895	45,045	11	14,500	32.2
1896	51,219	14	15,094	29.5
1897	58,911	21	14,566	24.7
1898	53,035	12	14,310	27.0
1899	57,834	13	14,418	24.9
1900	54,393	12	14,233	26.2
1901	56,415	12	14,780	26.2
1902	59,685	13	14,703	24.6
1903	57,642	13	14,064	24.4
1904	48,111	13	11,907	24.8
1905	49,349	13	12,902	26.4
1906	55,848	13	14,319	25.6
1907	45,391	12	13,636	30.0
1908	40,198	11	10,162	35.3
1909	37,394	11	8,953	23.9
1910	35,231	12	8,066	22.9
1911	36,297	8	7,643	21.1
1912	36,873	8	9,067	24.6
1913	35,501	10	9,079	25.6

BIBLIOGRAPHY

Manuscripts

Gwynedd Archives Service (G.A.S.), Caernarfon; Dorothea Quarry MSS; G.P. Jones MSS (uncatalogued); L.N.W. Railway plans; Pen-yr-orsedd Quarry MSS.

University College Archives (U.C.N.W.), Bangor; Nantlle MSS.

Owen Humphries, Datblygiad Chwarelyddiaeth Dyffryn Nantlle y chwarter canrif diweddaf, Rhagfyr 1943. Unpublished essay.

G.P. Jones private collection.

Tal-y-sarn Hall estate private papers.

M.J.B. Wynne Williams private papers.

Newspapers and Parliamentary Reports

Baner ac Amserau Cymru.

Carnarvon and Denbigh Herald.

Census returns, 1871. Parishes of Llanwnda and Llanllyfni, Caernarvonshire.

H.M. Inspector of Mines annual reports.

Ordnance Sheet XXI.9 1888, 1899 and 1913 surveys.

The Welsh Slate Industry. Report of a committee set up by the Ministry of Works, H.M.S.O., (1947).

Personal Testimonies

Messrs. Ifor Hughes, 61 Hyfrydle Road, Tal-y-sarn (ex-quarryman).

Owen Humphries, 17 Bro Silyn, Tal-y-sarn (ex-quarryman).

Lefi Jones, Bro Silyn, Tal-y-sarn (ex-quarryman/fitter).

Gwilym Roberts, Coedmadog Road, Tal-y-sarn (ex-blacksmith).

M.J.B. Wynne Williams, Dorothea House, Tal-y-sarn (ex-managing director)

Printed Sources

- Davies, D.C. A Treatise on Slate and Slate Quarrying (London, 1878).
- Griffiths, J. (ed. W.J. Griffiths). Chwarelau Dyffryn Nantlle a Chymdogaeth Moeltryfan, 1889 (Conway, 1934).
- Hobley, W. Hanes Methodistiaeth Arfon, (Caernarfon, 1900).
- Lindsay, J. A History of the North Wales Slate Industry (Newton Abbott, 1974).
- Owain, O. Llew. Cofiant Mrs. Fanny Jones, (Caernarfon, 1906).
- Postal Directory of Carnarvonshire, (Liverpool, 1886).
- Pritchard, D. Dylan. The Slate Industry of North Wales, (Denbigh, 1946).
- Richards, Rev. G. Dathlu Canmlwyddiant Eglwys St. Ioan, Tal-y-sarn, (pamphlet, 1972).
- Thomas, Owen. Cofiant y Parch John Jones, (Wrexham, 1874).
- Turner, S. The Padarn and Penrhyn Railways (Newton Abbott, 1975).
- Vincent, J. (ed.). The Memoirs of Sir Llewelyn Turner (London, 1903).

Printed Articles

- Fernsides, W.G. and Morris, O.T. "The Stratigraphy and Structure of the Cambrian Slate Belt of Nantlle, Caernarvonshire". Quarterly Journal of the Geological Society, vol. lxxxvii, pt. 2, 250-303.
- "Increased Efficiency in Slate Quarrying." The Oil Engine, August 1937, pp.126-
- Pritchard, D. Dylan. Series of articles in Quarry Manager's Journal, 1940s.
- Williams, R. "Hunangofiant Chwarelwr". Cymru, 1899-1900.

