This article was first published in *Presenting Monmouthshire,* 1970, Vol. 2, pp 3-8.

THE SEVERN TUNNEL CONSTRUCTION FORCE

A Study in the Quantitative Interpretation of Ecclesiastical Records

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Social historians encounter considerable difficulty in interpreting the trend of regional economic development when documentary records are unreliable, incomplete or, more usually, non-existent. Documentation covering the era of Severn Tunnel construction 1872-1886 is notably sparse and to supplement T. A. Walker's published engineering treatise, *The Severn Tunnel. Its Construction and Difficulties* (London, 1891), factual information has to be culled from various fragmentary sources.[1] This note highlights the valuable role of hitherto underexploited employment data derived from ecclesiastical records in the partial reconstruction of the parish employment structures of Caldicot and Portskewett during this era of rapid social and economic change.[2]

Census enumerations for the period 1861-1891 demonstrate clearly the rapid population growth which obtained in the parishes of Caldicot and Portskewett. Preliminary analysis of these selected data highlights certain features which accrued in direct response to the assembly, deployment and local accommodation of part of the considerable tunnel labour force on the Monmouthshire shore.

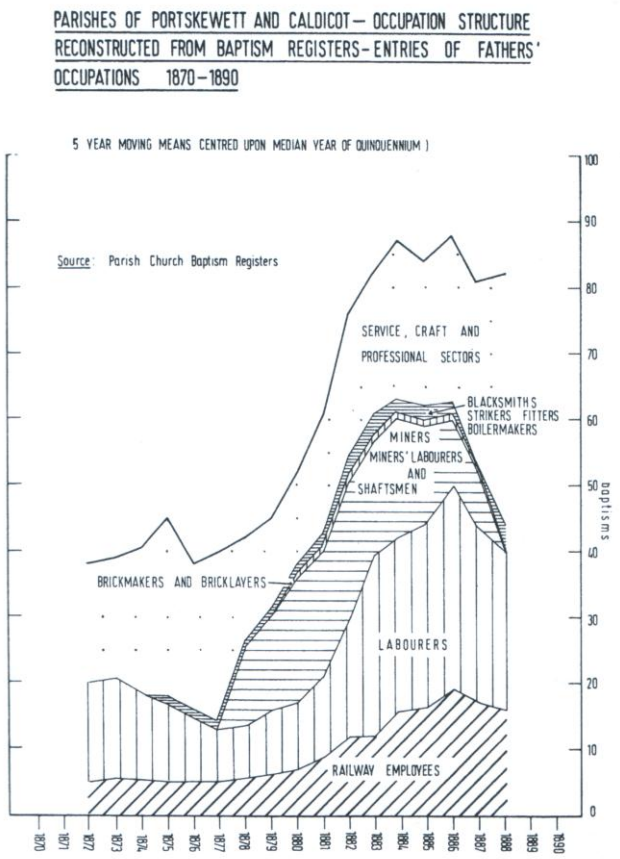
	CALDICOT					PORTSKEWETT				
Census Year	Male	Female	Total	Number of Inhabited Houses	Average Persons/ House	Male	Female	Total	Number of Inhabited Houses	Average Persons/ House
1861	287	292	579	133	4.3	87	88	175	36	4.8
1871	529	433	962	185	5.2	130	144	274	48	5.7
1881	746	655	1401	256	5.5	291	195	486	76	6.4
1891	629	664	1293	271	4.7	619	571	1190	184	6.5

Whereas part of the population growth of Caldicot was attributable to the influx of wire workers to the new works at Caldicot Pill in the early 1860s, increases in both the population and number of inhabited dwellings in Portskewett Parish were almost exclusively confined to the new settlement of Sudbrook and only marginally to the earlier parish village of Portskewett. Furthermore, the pronounced imbalance between the sexes in 1881 was a direct function of the large young immigrant male labour force lodging at Caldicot and reflected the success of T. A. Walker's canny policy of constructing large terraced houses at Sudbrook to accommodate nuclear families who cared for groups of lodgers.

Amongst other highly relevant details the dated entries in the Church Marriage Registers record the occupation of the bridegroom, occasionally that of the bride and their respective fathers' occupations. The father's occupation is entered in the Baptism Register alongside his name. Unfortunately, not all children were baptised and not all marriages were solemnised in the Parish Church. Civil marriage ceremonies were permitted by the Civil Registration Act of 1836 and the compulsory civil registration of birth of all children was introduced. From this date Church marriages represent an unknown proportion of all marriages celebrated locally and no statistical comparison of baptisms with civil registration of birth is possible as the Registrar General forbids research access to these registers. This limitation is particularly frustrating and whereas previously the spiritual needs of Nonconformists could have been met either at Caerwent or Magor, a meeting house for Bible Christians was opened at Caldicot Cross in 1865 and a Wesleyan Methodist Church

was built at Caldicot in 1872. Furthermore, T. A. Walker, the benevolent Severn Tunnel engineer, provided a Mission Hall at Sudbrook which also functioned initially as a day school. Many young growing families of Nonconformist Severn Tunnel workers could thereby have resided in either parish for several years without an accessible record of their existence and father's occupation. This situation, however, is not unfamiliar to historians. Careful synthesis of the available documentary material demonstrates that despite these limitations certain economic features of the period 1870-1890 may be illustrated from parish register material.

Ninety-five marriages were recorded in the parish registers of Caldicot and fifty-eight at Portskewett during the period 1870-1890. The marriages of tunnel construction workers were most numerous between the years 1883-1887 when the annual overall marriage totals consistently exceed the period average in both parishes. However, as the twenty-four tunnel workers' marriages recorded at Caldicot and the sixteen at Portskewett occurred over the period 1878-1887 any firm inference as to the trend of occupational sequence is hazardous except to comment that most records of tunnel miners and their labourers occur in the years 1882-1885 and that throughout this period tunnel workers comprised over half of the recorded marriages. Fortunately, baptisms were more frequent during the period 1870-1890. Eight hundred and seventy-four and four hundred and ten were recorded at Caldicot and Portskewett, respectively. Throughout the period of most active tunnel construction after 1880 the numbers of recorded baptisms greatly exceeded the annual parish means of forty-two and nineteen with peaked values of seventy-three recorded at Caldicot and forty-five at Portskewett in 1884. The combined annual baptism totals for these parishes are shown on Fig. 1 where minor fluctuations of trend have been smoothed by graphical techniques.



As the progressive changes in the size and composition of the Severn Tunnel construction force were related to phases of engineering work a brief synopsis of the engineering programme is essential to provide a temporal context for assessing structural change in the labour force. The first phase of Tunnel construction which commenced on the

Monmouthshire shore with the cutting of the first pilot shaft on 18th March 1873 included the excavation of four shafts at Sudbrook, the installation of pumping equipment and the statutory cutting of a heading beneath the Severn. This heading lay within one hundred and thirty yards of the Gloucestershire shore by mid-1879. Excavation of the first shaft on the Seawall (Gloucestershire) side of the Tunnel was started later on 22nd June 1880. A revision of construction policy was instituted to combat recurrent fresh-water flooding and a modification of tunnel floor gradients and the excavation of a further four shafts were the measures introduced successfully by the newly appointed engineer, T. A. Walker, so that tunnel workings were once again dry by December 1880. The actual work of building the tunnel commenced in 1881 but persistent fresh-water flooding of the tunnel caused by the Big Spring produced further delays and on 10th October I883 a freak tidal wave swamped the Sudbrook workings and shafts. Not until an additional six pumps had been installed alongside the tunnel was the Big Spring contained. Gangs of bricklayers prepared the three feet thick tunnel lining in the wake of the departing miners. In April 1881 Sudbrook brickworks became fully operational with a shale crushing plant, eight Staffordshire kilns and two brick drying sheds. Twenty-eight million of the seventy-six million vitrified tunnel-lining bricks were made locally from an admixture of crushed fireclay shale and sandy marl retained from the tunnel spoil. The last section of the brickwork was keyed on 1st April 1885 and the brickworks subsequently closed. The large Guibal ventilating fan was installed towards the end of the year and the first regular freight train passed through the Tunnel on 1st September 1886 to be followed on 1st December by the first regular passenger train of the Cardiff-Bristol service.

Whereas between three and four hundred men were employed in the Tunnel in 1882, a peak labour force of three thousand six hundred and twenty-eight was engaged in 1884. T. A. Walker records that £4,327 13s. 9d. was paid to three thousand one hundred men engaged on Tunnel construction work on 21st December 1884. Summarising these detailed wage tables the breakdown of the aggregate manual labour force was:

Foremen	77
Skilled labourers, carpenters, miners, fitters, engine drivers, timbermen	1,640
Labourers	1,106
Boys	244

A clerical component of forty-five timekeepers and pay clerks supported this workforce.

Excavation work was undertaken by compact teams of five miners and twenty-one labourers under the direct surveillance of a ganger. Supernumerary runners pushed spoil skips to meet ponies or wire ropeways. Fifty such labour units were active on the Monmouthshire shore at the height of construction work in contrast to the seventeen on the Gloucestershire shore. Although arduous, the work was exceptionally well paid in comparison with local agricultural wages and thus proved attractive to the unskilled male labour force of the region especially to men from the predominantly agricultural parishes of interior Monmouthshire and apparently stimulated a wave of residential and occupational mobility. The average weekly earnings of a shift working miner were £1 18s 0d. and those of a miner's labourer £1 7s. 6d. These earnings greatly exceeded the average weekly agricultural wages at Chepstow recorded by A. W. Fox[3] as 12s. 0d. in 1871, 13s. 0d. in 1881 and 14s. 0d. in 1891.

Although many of the single and married Tunnel workers lodged in the locality and their duration of local residence was invariably short, many of the observations on the progress of Tunnel construction and labour force composition cited from T. A. Walker's book can be substantiated by guarded reference to ecclesiastical registers. Records of miners, miners' labourers and shaftsmen were confined to the period 1877-1888 and it is noteworthy that shaftsmen were most numerous during the early part of this period and associated with the excavation of pumping shafts at Sudbrook (see Fig. 1). Miners assumed a later prominence. The range of wage scales recorded by T. A. Walker for labourers suggests that many were probably employed on surface work although their numerical distinction from the general

labouring class now proves impossible. Other occupational grades were of a lesser numerical importance and, reasonably, it might be suggested that the ecclesiastical records consistently underestimate the relative numerical importance of the brickmakers and bricklayers during the period 1881-1885. Blacksmiths were employed to shoe the ponies stabled at Sudbrook and fitters, strikers and other technical tradesmen were engaged in a variety of surface and underground capacities but especially for the maintenance of the coal-fired boilers activating the Cornish beam engines pumping water from the Tunnel. Professional, craft and service sectors of each parish were naturally augmented as the parish populations increased and throughout the period local craftsmen were actively engaged in domestic building programmes at Carter's Town, Caldicot Pill, and Sudbrook village. Carpenters were also employed underground for the preparation of working platforms for tunnel-lining bricklayers and sawyers were engaged at the Tunnel mouth sawmills. Naturally, the locally resident G.W.R. labour force was augmented to marshal the vast quantities of tunnel construction materials and Welsh steam coal destined for the voracious coal-fired boilers.

Admittedly, the entries made in ecclesiastical registers are confined to an unknown proportion of each parish population in any period and are obviously weighted in favour of the young marrieds. Any conclusions must therefore be exceedingly tentative. Nevertheless, in the absence of superior documentary evidence, ecclesiastical records possess a positive value as seen in this case study where an indication of qualitative change in the youthful Severn Tunnel construction force amplifies the skeletal data presented on this aspect by T. A. Walker and sheds further light on the tunnel construction schedule outlined in his authoritative text.

REFERENCES

1 To avoid an excessive number of footnotes, further references to the factual content of this authoritative text are undocumented.

2 The kindness and co-operation of the Rev. R. Hallett, Vicar of Caldicot and of the Rev. W. A. Evans, Rector of Portskewett, is gratefully acknowledged. Without their assistance this work would have been impossible.

3 A. W. Fox: *Agricultural Wages in England and Wales During the Last Fifty Years*, Journal of the Royal Statistical Society, Vol. LXVI, 1903, p. 340. This precise observation is supported by T. Coleman: *The Railway Navvies*, London, 1965, p. 59, who states that: ‘Throughout the century, a railway navvy could earn more than, say, a farm labourer-sometimes two or three times as much.’