

Baltinglass at the battle of Glenmalure in 1580. The plans for a new county had to be scrapped in the face of open rebellion.

Hostilities continued through to the turn of the century and by the end of the 1500's the O'Byrne's were experiencing great hardship. The defeat of the Irish in Kinsale signalled the beginning of the end for the Gaelic chieftains' old way of life. The final bell tolled for them with the Flight of the Earls from Rathmullan, from County Donegal on 14 September 1607.

Boundaries

The division of land in 1450 is shown in Figure 1 and a detail of the Pale is shown in Figure 3: County Wicklow in Ireland Figure 2. The County Wicklow boundaries were drawn up to reflect the stated ownership of land by the O'Byrne's and O'Tooles circa 1578; and after slight modification were adopted by the Shire Act in 1606.



Figure 3: County Wicklow in Ireland

These were, much later, added to by an adjustment made in 1957 by a Local Government Act when County Dublin land was ceded to County Wicklow to the north of the County on the Western side of Bray. [2]

The geology and topography

The geological structure of Ireland in the County Wicklow area has had a fundamental effect on the development of the County. The complex nature of the geology, is described in more detail in 'The Geological Heritage of Wicklow' [4], and the glaciers of the Ice Age have shaped the topography as we know it today.

Early workings

As early as 2500BC it is believed that Bronze age mining for copper was in hand around the Avoca area. Then about 1000AD corn was being milled using a horizontal water mill in a valley in Timore townland.

The principal activity was agriculture, mainly grazing, using the Booley system described in the Brehon Laws. Cattle and sheep were grazed in high pasture land during the summer period, then the flocks and herds brought down to lower milder pastures in the more severe winter months.

The herdsmen and women would move with the animals, but the young children and older or infirm adults would dwell in family or clan groups centred around lowland Clachan. This persisted until the Act of Union and the beginning of the plantation when groups, from Scotland, Wales, and England, were given land and displaced the native Irish. The settlers were encouraged to clear and plant their land, to grow crops for the expanding markets in the cities both in Ireland and elsewhere. Fences and field boundaries became common and nomadic animals were confined to the higher ground all season. Repeated planting and intensification of demand on the land depleted the soils of nutrients.

Modern methods



Figure 4: County Wicklow in 2016

When Arthur Young [5] wrote about Ireland [6] in 1776-9 he was not impressed with much of the agriculture in the countryside, but there were some notable exceptions where land was improving. Later in Samuel Lewis's publication [7] of 1837 most land was improving with the use of crop rotation, and lime was used as fertilizer or soil improver.

The Ice age left a significant number of 'Erratic' boulders of Granite and other rocks of large size. The towns and cities were beginning to grow so the first signs of industry in Wicklow came from the land improvement. The Erratic boulders too large to move were cut down where they set, and the resulting rock was trimmed by stone cutters to suit building construction locally, and for transport into the towns and cities.

Limestone was being imported from Sutton via Howth into Bray, Wicklow and Arklow harbours. Stone was transported over slightly improved roads to the harbours for improvement and local construction, or transported to other venues, by sea.

Lime stone was burnt in local kilns for distribution on the land and the remaining smaller pieces from the Erratics were used for field boundaries. Mention is made of an agricultural society formed by Earl Fitzwilliam in Tinahely for the advancement of knowledge and improvement of agricultural methods.

Noted produce was butter from some areas, and strangely, the milk was otherwise used to feed lambs for the Dublin market, leading to our well-known Wicklow Lamb.

In 1824 much of the Erratic boulders must have been used up because the stone cutters set up in quarries near Ballyknockan. Other small quarries were opened in all parts of County Wicklow for single purposes and then fell into disuse. Some produced products such as roofing slate from slate out-crops but the principal granite quarry remained in Ballyknockan.



Figure 5 Ballyknockan Quarry 2016

A little earlier, in 1795, gold was discovered near Glendalough, and there was a brief but significant gold rush until taken over by the government. In 1798 the works were destroyed by the insurrection but in 1801 it was reworked systematically and then eventually abandoned after the mountain in the area was carefully searched for traces of gold in the rock. None was found, and the works were finally vacated.

Copper and lead were mined in several places in the east of the county.

Communications

From earliest times County Wicklow was difficult to traverse because of the rough terrain, mountains, bogs and forested areas; travel was forbidding. Much of the travelling that was done was by sea and by river.

Verbal communication was quoted as being unreliable because of the poor education of the population.

Early roads were dreadful. County Wicklow does not appear to have evidence of ancient road ways, and Ireland did not have the benefit of Roman road makers, although 'An Tóchar' [Roundwood] may refer to an ancient road or track way constructed across a bog in the area.

It is not known if the five trackways listed in the annals of the four masters ever reached as far as County Wicklow. However, Slighe Cualann may have been extended south from Bray to form the basis for the N11 or R761 today. As mentioned above, most long-distance travel was by water in Medieval times.

In 1614 the Irish Parliament passed the Highways Act which enabled the Parishes to maintain roads within their boundaries with emphasis on those serving Market towns. The parishes were encouraged to maintain existing roads and to build new ones. In 1634 a new act allowed the levying of taxes' ... to ensure the repair, maintenance or reconstruction of bridges, fords or causeways.'

Herman Moll's map, dated 1714, shows the familiar routes, approximately, of the N11, N81, and the coast road R761 through Redford. [Radfoard]

In 1765 the County Grand Juries were empowered to raise funds for road repairs, maintenance, and construction of new routes; thereby taking over the function of the parishes until 1898.

In 1800 the Military Road was started and finished in 1809 to secure military access into remote areas of the countryside.

Considerable improvement took place in Blessington after the construction of a new turnpike road from Dublin to Carlow, by way of Baltinglass, in 1829, by which the Waterford mail, the Kilkenny day mail, several coaches and cars to the counties of Wexford and Carlow, travelled through it. [7]

Arklow ' ... Macadamised the principle street and laid down foot pavements ... ' before 1832 [7]

In 1831 the Irish Board of Works took over the responsibility of managing the road network.

In 1898 the Local Government (Ireland) Act required democratically elected County Councils to take over the administrative functions of the Grand Juries.

Market Towns began to form important transition points for trade and exchange of ideas. Markets and/or fairs were held in Arklow, Ballymore-Eustace, Ashford, Ballinacor, Baltinglass, Blessington, Bray, Carnew, Dunlavin, Rathdrum, Roundwood, Stratford-upon-Slaney, Tinahely, and Wicklow Town.

The produce list is also surprising which includes Butchers' meat, Cattle, Corn, Flannels², Friezes³, Horses, Pigs, Potatoes, Poultry, Sheep, Vegetables, and Woollen cloth.

Many of the market towns were also post towns that would have been connected by the mail coaches on the improved road system. Those that were not post towns had a penny post system that took the collected mail to the nearest post town for delivery to various destinations.

In 1834 the railway was constructed between Kingstown [Dun Laoghaire], and Dublin City, with extensions into the interior of the island. Eventually reaching Bray in 1855 and then through to Wexford very soon afterwards.

Horse buses, and tramways as public services to feed the railways developed rapidly to serve the expanding populations in the towns. The Dublin and Blessington Steam Tramway (DBST), later the Blessington and Poulaphouca Steam Tramway, operated steam-powered trams between Terenure in Dublin and Blessington in Co. Wicklow from 1888 until 1932. [8]

The industrial revolution

The industrial revolution started in the middle of England and the ideas spread by the communications mentioned above, generated a desire to move away from cottage industry to collective industry by setting up factories to produce large quantities of product at a lower price. Some prospered but many failed through lack of resources, market volume, or changes in market taste. Examples to be found in County Wicklow are:

Cloth

The flannel and frieze manufactures were formerly of considerable extent, the chief market for their produce being Rathdrum, where a handsome flannel-hall was erected by the late Earl Fitzwilliam, but they had, by 1837, entirely declined, and their only vestige was the manufacture of a little frieze for domestic use.

² Flannel is a soft woven fabric of various fineness. Flannel was originally made from carded wool or worsted yarn, but is now often made from either wool, cotton or synthetic fibre. Vegetable flannel is made from Scots pine fibre.

³ Frieze (French: fris ) is a Middle English term for a coarse woollen, plain weave cloth with a nap on one side. The nap was raised by scrubbing it to raise curls of fibre, and was not shorn after being raised, leaving an uneven surface.

Fishing

In 1837 the principal fishery was that for herrings at Arklow, which had much declined. They were also taken by a few fishermen at different places along the coast, but the extension of this branch of industry was checked by the lack of safe harbours for the boats. Oysters were also taken at Arklow and carried to Liverpool and Dublin.

Exporting

From Samuel Lewis's 1837 description:

"The trade of the county consisted chiefly in the exportation of its agricultural and mineral produce, and in the importation of the various supplies of foreign articles and manufactured goods necessary for its inhabitants. Although Dublin is a principal market for the northern part of the county, Wicklow is a very improving port, where there are several stores; and grain and cattle are sent from the southern part of the county to New Ross. This branch of the trade is entirely carried on by ordinary land carriage, as the county is devoid of river or canal navigation, or rail-road communication.

The rivers are numerous, but their courses rapid and short, except some that flow westward: the principal are the Liffey, the Slaney, the Ovoca, the Vartrey, and the Derry, Daragh, or Aughrim ...

Factories

From Samuel Lewis's description of 1837 [7], the factories were quite numerous.

Christopher Dromgoole erected a factory in 1802 near **Ballymore Eustace** that produced many different types of cloth and, when in full production, provided employment for 700 persons.

In **Baltinglass** they manufactured linen, woollen and diaper⁴ cloth. There were two bleaching greens for improving the linen and an extensive flour mill. In **Stratford on Slaney** there were also some extensive cotton and calico⁵-printing works. Adjoining the town, on the bank of the river, the extensive works, established in 1792, by Messrs. Orr and Co; in 1837 they employed from 800 to 1000 persons: the machinery was worked by water power, and the average number of pieces printed and finished weekly was about 2000. The history of Calico printing is fascinating, relating to trade wars, import tariffs, and social demand.

Bray had established a very extensive brewery (possibly H. Christie 1824), with a malting store capable of producing 300 barrels a week. Nearby was a large flour mill.

Carnew had a malt house, two snuff and tobacco manufactories, and a small brewery.

Delgany had a small manufacturing business of straw plat and nets; and about three miles to the south of Bray Head, on a low rocky point, was the small fishing hamlet called the **Greystones**.

Near Donoughmore, at **Knocknamunion**, was a factory for making blankets and frieze.

⁴ Diaper cloth made of repeated looped cotton fabric used for adult or baby napkins.

⁵ Calico unbleached cotton cloth sometimes rough in texture.

At **Rathdrum**, the manufacture of flannel was carried on to such an extent that the Irish government deemed it necessary to appoint a seller of flannels to superintend it, under whom were a deputy and eight sworn meters, who resided in the town. A flannel-hall was erected in 1793, at an expense of £3,500, by the late Earl Fitzwilliam, who received a toll of 2d on every piece of 120 yards, which produced on an average about £300 per annum: the trade continued to flourish so long as the protecting duties on Irish woollens were maintained, but on their repeal, it declined rapidly and was, in 1837, nearly extinct. The few pieces then made were purchased by the shopkeepers in the town.

The manufacture of woollen cloth also flourished there but owing to the same causes had declined from 1825 and was also extinct.

A large factory at **Greenane**, on the Avonbeg, was burnt down during the disturbances in 1798. There were two breweries in the town.

In **Shillelagh**, adjoining the village, were extensive flour, carding, and bone mills, and a bleaching green. At **Tinahely** soap-boiling was carried on, there was also an extensive flour-mill and a tan-yard.

Then in the late nineteenth and early twentieth centuries we remember the factories like **Kynoch** in **Arklow** that grow rapidly to support multiple wars in various regions of the world only to disappear just as quickly following accident and rationalisation on a world-wide scale.

Labour

Population

Ptolemy has intimated that the inhabitants of this part of the island were the *Cauci*, supposed to have been of Belgic-Gaulish extraction. However locally, it is chiefly celebrated as the country of the Byrnes and the O'Tooles, the former of whom occupied the northern and eastern parts, and the latter the south-western.

The Central Statistics Office holds population figures back to the census of 1841 and the figures for County Wicklow are shown in [9].

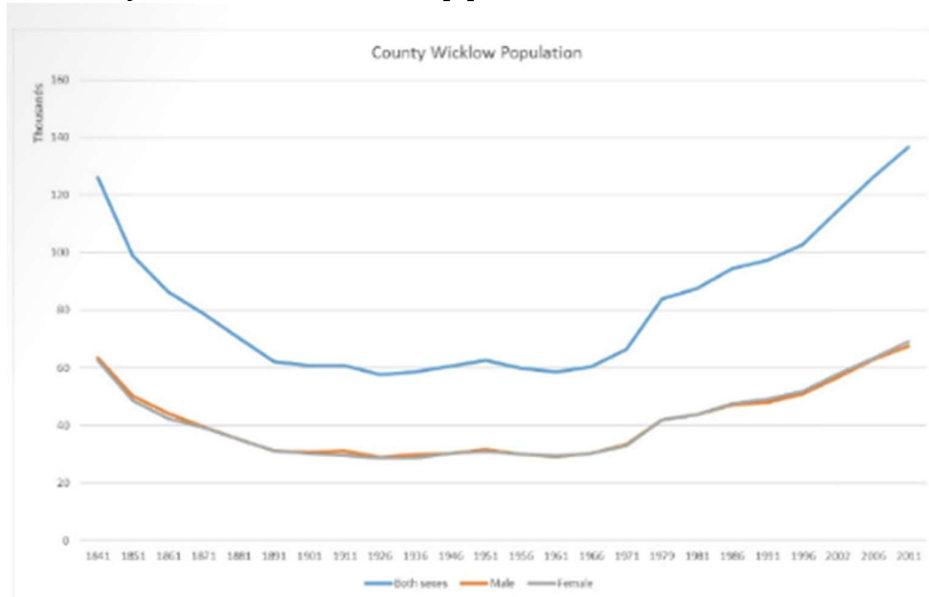


Figure 6 Population changes in County Wicklow

In 1841 the population of Ireland was taken as 6,528,799. In County Wicklow there is a clear decrease in the numbers from 126,143 in 1841 to 60,824 in 1901, probably due to the famine, land clearance, and emigration. The effect of the first and second world wars are just noticeable from 1914 to 1942 with a bounce back soon afterwards. Then again, a decline as many left through lack of work. There is an exponential rise in numbers from 1966 to 1979 then a slightly less rapid growth to the latest figure of 136,640 in the census of 2011. The female and male numbers have remained equal for the period since the census was taken on a ten- year basis beginning in 1841. The latest estimated figures are a total of 142,332 in the census of 2016 with 2,060 more females than males in the county.

The total population for Ireland has been estimated at 4,757,976 for 2016.

This shape is repeated in the national figures so it does not appear to be influenced by the county's rural nature and the general move to the cities associated with the industrial revolution. We could infer that County Wicklow has not been unduly affected by the Industrialization of Ireland. Unless of course when we look at the rapid rise in population again from 1966 and consider that since that date the county has become one of the dormitories of Dublin City.

Education

Samuel Lewis mentions schools in several towns and villages on his survey of County Wicklow dated 1835.

Poor Laws and the Famine

In 1703 the Irish Parliament passed an act 'Providing the erection of a workhouse and for the maintenance and apprenticing out of foundling children'. These known 'Houses of Industry', then in 1838 came the Irish Poor Law Act following on from a Royal Commission on the Poorer Classes in Ireland 1833. The Poor Law act provided work- house or outdoor relief administered by Poor Law Unions in Ireland.

There were three work- houses in County Wick- low; Baltinglass, Shillelagh, and Rathdrum. During the Great Famine, work-houses became so overwhelmed that large numbers of paupers were assisted to emigrate, or encouraged to work on the famine roads where a form of outdoor relief was given by low wages to purchase food for themselves and the family. This had the effect of permitting more to enter the workhouse in the hope of escaping starvation and disease. In response, Guardian-assisted emigration was reserved only for those who had received indoor relief for over two years.

Energy sources

The industrial development has relied on a suitable energy source to drive the machines that mechanise and increase production capabilities.



Figure 7 Poor Law Division of Leinster 1897

Peat

Peat or turf from the bog was one of the primary fuel sources generally procured within the parish. Samuel Lewis mentions some parishes where the local bog was worked out and he also mentions that the turf along the coastal region was impregnated with salt that made the flame very blue and of low heat value until it had been liquefied with fresh water and allowed to dry when it became a superior fuel.

Water Mills

In Prehistoric times grinding was done with hand tools, initially by pounding with stones, then by grinding as with quern stones. In later historic times, I understand, the earliest European water mill was made to a design brought from China in about 1AD. I have mentioned the remains of a horizontal mill in Timore townland, this is presumed to date from 1000AD and details are included in Canon Robert Jennings article in the second edition of this journal. [10]

Later vertical water driven mills were used where the head of water was available, and several sites have been identified by the Office of Public Works in the confines of County Wicklow. One of which is the mill close to Mill Road in Greystones, that was served by a water from the Three Trout stream; referred to by Samuel Lewis in 1837 [7] and in Freeman's Journal, 26 August 1871. Also, mentioned by Sean Daly in historical detail. [11]

Timber

Wood had been extensively used in the County from ancient forests and a lot of this was felled and exported for ship building over many generations. Shillelagh once the most celebrated forest in Ireland for the excellence of its oak, which was exported to different parts of Europe; and hence it is also said that Turlogh, king of Leinster, sent the oak for the roof of Westminster Hall to William Rufus.

Coillte are using vast areas of the County to grow soft woods and hardwoods in commercial forests; monitored and managed by that state-run body.

Steam

Steam power was the eventual end for both water powered, and wind powered mills, but few of them are mentioned in the county. This is possibly due to the lack of a local supply of coal. Peat did not provide enough energy without special processing to generate high enough temperatures. However, steam pumps were used to remove water from some of the mining operations.

It was noted during a visit to Craanford Mill, Gorey in Wexford that steam driven mills had been the downfall of that mills production.

Wind

There does not appear to be any mention of wind mills within County Wicklow but electricity is now being generated by wind mills at several sites in the County and feeding into the national grid.

Coal importation

Coal was not found in the County and had to be imported. Most imports were through Arklow, Bray and Wicklow harbours. Greystones had local imports to the harbour for some time. We understand that was transhipped from imported coal to Bray or Wicklow by a purpose built sailing coaster owned by the local coal merchant.

Gas Generation

Gas technology dates from the mid 1850's. Town gas may have been generated locally but latterly has been piped from Dublin and now is natural gas from the national network. Where this is not available it is possible to use bottled or bulk gas for commercial or domestic installations.

Water and hydraulic power

County Wicklow because of its situation and topographical profile has an adequate supply of water from the prevalent westerly and easterly winds. Being in the Eastern half of Ireland it receives between 750 and 1000mm of rain per annum; in mountainous regions, this could reach 2000mm per year. [12]

The mountainous terrain, relative altitude, and in general sparse population lends itself to an ideal area for water storage. The proximity to large population with a need for clean water makes it a region of national importance.

Vartry Reservoir

Dr John Gray, proprietor of the Freeman's Journal and active politician, chaired the Dublin Public Health Committee, that was instrumental in advocating and constructing the Vartry Scheme.

It consisted of two reservoirs, a water treatment plant, a 4km tunnel under Callowhill and 60km trunk main.

The Vartry reservoir with associated filtration and pipe work were opened on 30 June 1863 to supply potable water from behind an earth dam on the Vartry River to a stilling reservoir in Stillorgan supplying Dublin with clean water supplies at a time when the public health of Dublin residents was in poor condition.



Figure 8 Sir John Gray

Dublin's population had increased rapidly because of the famine moving people from the countryside into the cities, and the effect of the Industrial Revolution peaking at the same time. Sanitation and water supplies were severely stressed.

The first works now referred to as the Lower basin had a capacity of 11.3 billion litres and a maximum depth of 18.3 metres. A second embankment, 3.5 km upstream, was completed in 1923 to form the upper reservoir. This has a capacity of 5.6 billion litres and a maximum depth of 13.4 metres

In 2016 the National Government is contemplating spending €200 million on an upgrade of the treatment works to increase throughput and the quality of the outgoing water.

Blessington Lakes or Poulaphouca Dam

As demand increased in Dublin a larger source of water was sought and the decision was made to construct a dam at Poulaphouca [the Púca's hole] in 1937. This was a joint project with the Electricity Supply Board [ESB] and Dublin City Council to supply potable water and electrical power. The 30MW power station would be the second hydroelectric power station in

Ireland after that at Ardnacrusha. Built during the second world war construction was slow and no German technology could be used.

Turlough Hill

In 1974 the pumped storage scheme was started at Turlough Hill. This now forms an essential part of the electricity network for Ireland. The power station enables the electrical grid to maintain power at or near 50 cycles per second by being able to bring on line considerable electrical power within 15 seconds of the demand. The station can generate 290MW of power for 4.5 hours by using water stored at the top of the hill to discharge into a lower lake through hydro - electric generators. The same units are used in reverse to pump the water back up the hill when demand has diminished and less expensive electrical power is available. It takes six hours to fill the top lake from the bottom lake.

21st century

By the end of the 20th century Ireland had initially severed connections with the United Kingdom and then grew closer with filial and trade links as part of the European Union. Money from the regional development fund had brought the roads, communication, and transport systems up to international standards. County Wicklow remained an essential part of the overall development.

Today County Wicklow has many areas dedicated to start-up companies and continues with its agricultural business; now run using up to date scientific methods but controlled very much by regulations formulated in Europe.

Tourism is one aspect of industry that is growing in County Wicklow as part of Irelands Ancient East initiative. This capitalises on the historic buildings and sites that have been maintained as a national heritage. The industry, possibly started in the early 1800's, has grown with the development of the railway and better road access into the countryside. This has included Powerscourt House & Gardens, Wicklow Gaol, Glendalough, many religious sites, stately homes, and estates. County Wicklow appears to be short of places to stay overnight so most travellers are obliged to move on into adjacent Counties for accommodation.

Weekend recreation has increased with hill walkers, mountain bikers, cyclists, small aircraft, and parapont flying very popular at present. This is taking advantage of the great countryside facilities and proximity to areas of large population.

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