



OROGRAPHICAL MAP OF WIRRAL.

The main watershed shown by heavy continuous line, minor divisions by dotted lines.

## WIRRAL WATERSHEDS AND RIVER SYSTEMS AND THEIR INFLUENCE ON LOCAL HISTORY.

*By E. H. Rideout, B.Sc., A.I.C.*

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**D**ESPITE their enormous importance in the scenery of the region no subject has received so little attention from the historians of Wirral, as that of the geography of its streams. Truly they may be insignificant when compared with the greater rivers of the country, but their slow and ceaseless action has done much towards the beautification of the district and they scarcely merit the contempt with which they have been regarded in the past. Thus Mortimer writes (p. 145):—

The only river, if the term can be applied to a stream so very insignificant, that exclusively belongs to Wirral, is the Birken, which rises in Newton Carr in the township of Grange; the Birken may, with some difficulty, be traced through several of the townships of West Kirby and Woodchurch, until crossing Saughall Massie it joins the Mersey at Wallasey Pool.

Sully again appears to have caught the contagion of Mortimer's disgust and proceeds to dismiss the subject of Wirral streams in a few words:—

The hundred of Wirral contains no stream of any note. The only one dignified by a name is the Birket, a sluggish little stream one branch of which rises in Newton Carr and the other on Frankby Heath; it meanders across the plains of Moreton, receiving in its course the waters of Greasby Brook and of the Fender, another sleepy streamlet which has its source in Landican. (21).

The profound influence exerted upon the topography of the district by these little streams is seldom realised. In

the first instance the courses of rivers and brooks are determined by the nature of the land, its general slope and configuration, and also to a great extent by the climate of the region. But although the rough outlines are given, the final delicate moulding of valleys and dales is due to the manifold interaction of these streams with the forces which brought them into being. Their influence upon the physical features also to a great degree determines the distribution of plant and animal life in the neighbourhood, and from these facts it naturally follows that they are to a great extent responsible for the positions of the earliest settlements of man.

From this point of view the influence of Wirral streams may be classified under several heads:—

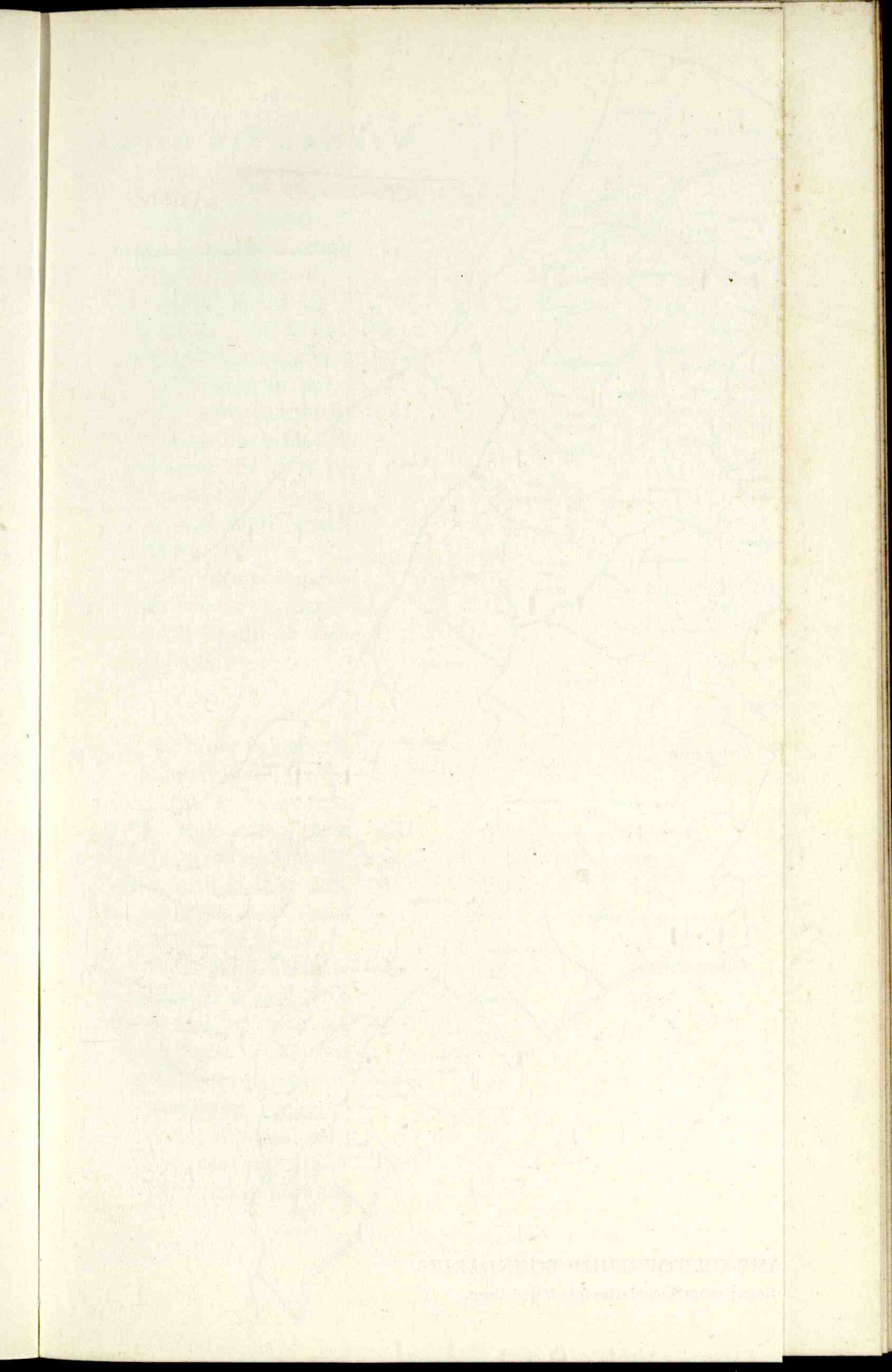
- (1) Influence on vegetation etc., modifying
- (2) The boundaries of townships and
- (3) Sites of townships and manor-houses; as well as
- (4) The positions of roads and fords.
- (5) The modification of internal arrangements of villages, sites of mills, and as the
- (6) Source of water supplies before the introduction of wells.

The greater streams of Mersey and Dee of course occupy a premier position, both defining the limits of fringing townships and also being responsible, especially the River Dee, for the positions of the settlements along their banks. Here however we are dealing only with the minor streams and reserving the larger rivers for the separate treatment their importance deserves.

#### I. VEGETATION.

The influence which the Wirral streams have exerted and are still exerting on the nature and distribution of the vegetation yet awaits thorough study. The stretches of damp alluvial land formed by the deposition of the stream's burden in the lower portions of its course have







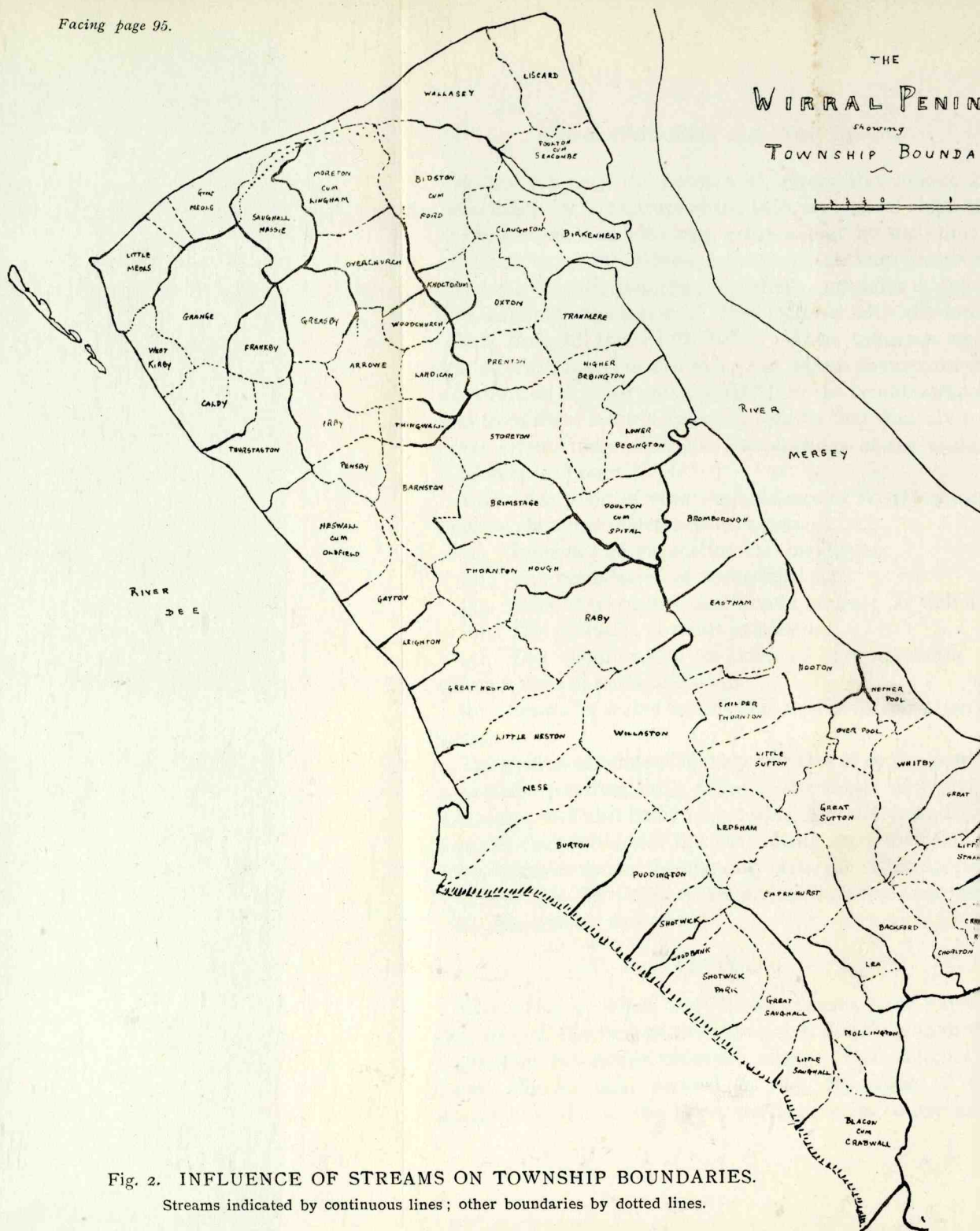


Fig. 2. INFLUENCE OF STREAMS ON TOWNSHIP BOUNDARIES.

Streams indicated by continuous lines; other boundaries by dotted lines.



naturally determined the positions of those rich meadows found in nearly every township.

In a primitive state of cultivation these swampy grounds would be left uncultivated, and avoided for dwellings, and would not be utilised until agriculture had reached some degree of importance. Even then, as can be readily seen in our own day, the fullest advantages of these lands cannot be obtained until a certain amount of drainage has been carried out. Present appearances would discount the view that the alluvial lands bordering the watercourses were ever densely wooded, trees being confined more usually to the sloping clay-sides of the stream.

The former condition of the Birket plain in the north and the Gowy marshes in the south is difficult to decide, and it would be unwise to form any conclusion on the subject.

## 2. TOWNSHIP BOUNDARIES.

In order to understand the importance of these streams in determining the boundaries of the ancient townships of Wirral, we must form a mental picture of the country at the time when these boundaries were first determined. It is a little difficult to form a just idea of the nature of the land at that time, accustomed as we are to the small inclosures and definite boundaries so well marked in England of to-day.

The early settlers in Wirral, we are assuming, only occupied a very small portion of the total area for agricultural or residential purposes, and probably the remainder of the country would be rough forest land with extensive patches of scrub, heath and marsh. In attempting therefore to devise boundaries in such a district it would seem that only the most prominent and permanent objects would be of any value.

Prominent hills and streams and occasional trees or even



the edge of a clearing would be the only materials available. Wirral at that time seems to have been covered with scrub and heath to so great an extent that few hills such as that at Thurstaston would be available; thus it can readily be seen that the valleys of what are now very minor streams would at that period have been the most prominent and extensive objects on the landscape.

However this may be, it is certain that the boundaries of the townships do in an extraordinarily large number of instances coincide with the courses of the various streams.

The map indicates the boundaries of all those townships which I have found to coincide generally with these ancient streams.

### 3. SITES OF TOWNSHIPS, ETC.

Besides forming the boundary lines of the township many of these streams would be peculiarly adapted to

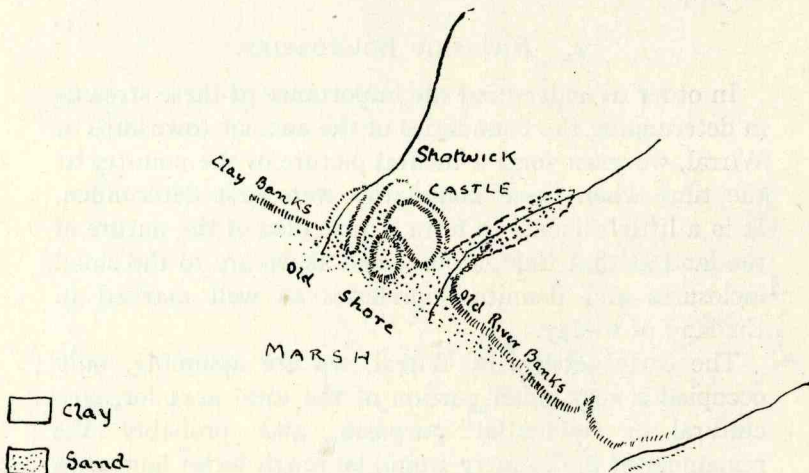


Fig. 3. Site of Shotwick Castle.

serve as defences against hostile invaders. One or two notable instances may be mentioned.

Shotwick Castle, the site of which is still to be distinguished by one or two peculiar mounds in Shotwick Park at the edge of the former Dee estuary, stood upon a



neck of land clearly defined by two deep gullies cut through the clay to the north and south respectively. The sketch shows the peculiar nature of the situation. Further than this it is interesting to notice that the bottoms of these gullies in the immediate neighbourhood of the castle mounds consist of glacial sands which underlie the boulder clay at this point. The exposure of these sands here is no doubt due to both the cutting down of the stream-bed in the normal course and also to the action of the tidal waters of the Dee, which would occupy these two small creeks, thus making the position particularly impregnable.

Another township, or originally perhaps manor, the situation of which has been practically determined by the disposition of the adjoining stream, is that of Poultoncum-Spital. The position of Wallasey is clearly defined by the curving course of the Birket; and the almost insular nature of the modern borough of Wallasey has been one of the most important factors in its history.

#### 4. FORDS AND ROADS.

It is sometimes difficult to determine the primary effect of streams, inasmuch as it is doubtful whether the site of some township has been determined by the main trackway or from its eminently suitable situation. The position of Shotwick might seem at first sight to have been chosen entirely for the excellence of its tidal creek as a shelter for vessels coming up the Dee. Besides this, however, there existed from very early times a ford from Shotwick to the coast of Flint<sup>1</sup> over the sands of the estuary, and it is questionable how far this ford may have been responsible for the site of the township.

The position of the hamlet of Ford, near the present Upton Station, was doubtless determined by the fact that this was the lowest point on the course of the Fender at

<sup>1</sup> *Hist. Soc. Trans.* 66, II.

which a safe passage could be made across the marsh on the road from Bidston to Overchurch. Backford again was situated on the ford across the Broxton Valley, on an old line of road; whilst further north, even until the last century, all traffic by this road to Tranmere and the adjoining districts had to cross Bromborough Pool by the road below Bromborough mills. The tide formerly reached the dam below the mills, and thus until road engineering had sufficiently advanced to bridge the gap near the mouth of the pool a long detour was necessary. This old Chester Road encountered yet another difficulty in the crossing of Tranmere Pool, being diverted from its course to the Woodside and Birkenhead Ferries into Whetstone Lane and Grange Lane, owing to the lack of a bridge below the Priory.

So far as the ancient roads in Wirral have been traced it appears that, in common with their relations in the rest of the country, they avoided the marshy valleys and went along the higher ground as far as possible. Modern roads and railways, seeking the easier gradients, tend to follow stream courses. An interesting contrast is shown by the ancient road from Bidston to Neston, through Upton, Woodchurch, Thingwall and Barnston, and the modern Great Central Railway, following the course of the Fender and declining a cutting as long as possible. From the point of view of future development it is of importance to notice that this method of railway construction, by placing its intermediate stations away from the ancient centres of townships, will tend towards the formation of suburban colonies near the stations and upon most unsuitable soils.

##### 5. INTERNAL ARRANGEMENTS OF TOWNSHIPS.

With few exceptions the dwellings in the ancient Wirral townships are situated on the lighter and drier sandy soils. Around stretched the common arable fields;



on the stream banks was the watermill, before it was superseded in many instances by a windmill; the fields immediately abutting on the stream the common meadows. In Prenton this arrangement is easily seen on the tithe map. The highest lands, formerly open heath, were gradually enclosed as land became more scarce and valuable.

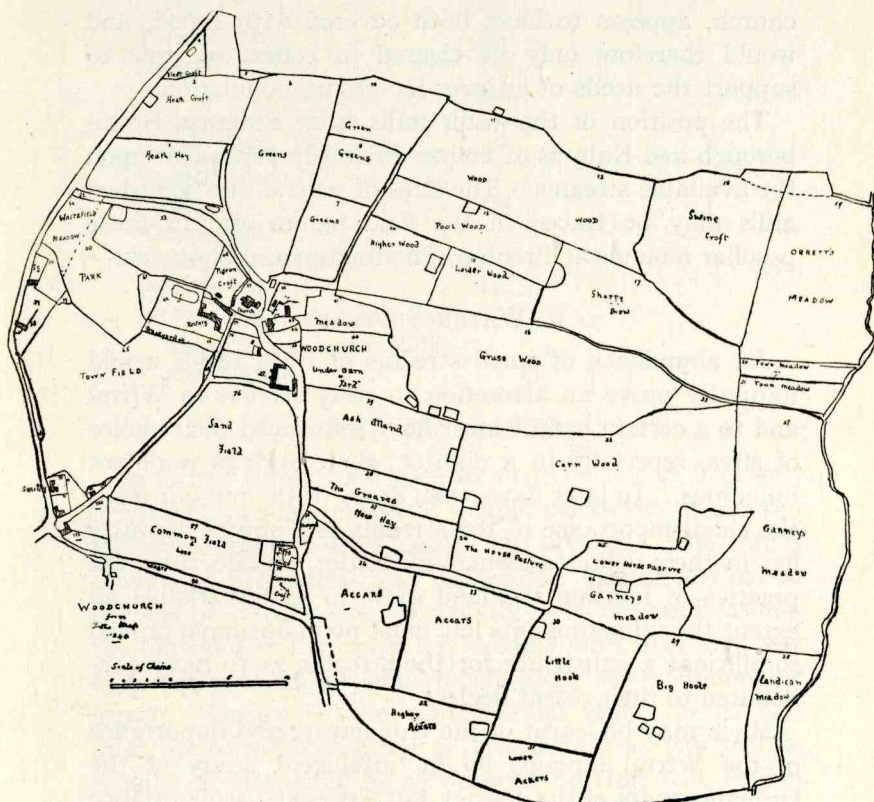


Fig. 4. Plan of the township of Woodchurch, 1842.

Those townships situated along the estuaries of the Dee and Mersey followed similar arrangements, except that the banks, seabanks and seafields appear to have been as at present more suitable for pasture than meadow. It



is remarkable in glancing over the old tithe maps and terriers of Wirral townships to notice how generally they include a portion of heath on the one side, meadows or pastures along the streams on the other, while the arable fields occupy the position at present in use on the medium loams. Much of the heaviest land in the several townships, as we gather from the field names for example in Woodchurch, appears to have been covered with forest, and would therefore only be cleared in course of time to support the needs of an ever increasing population.

The position of the water mills as at Stanney, Bromborough and Raby is of course obviously dependent upon the available streams. The sites of several now vanished mills may be traced in the field names and in those peculiar mounds at Prenton, Puddington and Shotwick.

#### 6. WATER SUPPLY.

An abundance of small streams of fresh water would naturally prove an attraction to early settlers in Wirral and to a certain extent must have influenced their choice of sites, especially in a district where springs were not numerous. In later days, even down to the present time, the chief importance of the streams as a source of water lies in their value to owners of cattle; though since the practice of marling the land grew to so remarkable an extent the numerous pits left must no doubt have proved so efficient a substitute for the streams as to have contributed to their recent neglect.

Much may be learnt of the true nature and importance of the Wirral streams by an intelligent study of the Ordnance maps of the district, but a personal acquaintance with the vagaries of Wirral foot-paths is certainly, in winter at any rate, calculated to give the unfortunate pedestrian a profound sense of respect for the little streams.

The chief watershed of the Hundred is that dividing the

basins of the Mersey and Dee, the whole of the drainage of the country falling either into the one or the other, no stream at the present time flowing directly to the sea at the northern extremity of the peninsula.

The chief points of the ridge, with their altitudes, are given in the following table:—

Grange Hill .. ..	170 ft.
Caldy .. ..	226 „
Thurstaston .. ..	300 „
Heswall .. ..	359 „
	323 „
“Glegg Arms” Inn ..	229 „
Cherry Farm, Hinderton ..	220 „
Badgers Rake .. ..	? „
Ledsham .. ..	145 „
<sup>1</sup> Grove Hall .. ..	? „
Strawberry Farm .. ..	? „
Poplar Hall .. ..	120 „
w. Chorlton to Caughall continued along Hoole Ridge	
E. of Chester .. ..	? „

### MERSEY BASIN.

In former times there were six main outlets to the river, denoting an equal number of smaller basins into which the Mersey drainage area could be divided. The rapid growth of Birkenhead has caused the Tranmere Pool to become practically extinct, exactly as in the same fashion the old Pool at Liverpool has become built over and now only survives as an undignified main sewer under the streets. Owing to the well marked character of this inlet the former condition of Tranmere Pool can still be readily reconstructed by an observer on Holt Hill, Higher Tranmere. It is now a deep recess; the floor is covered with railway and ship yards and a large and extremely

<sup>1</sup> A peculiar inaccuracy has been current for many years in watershed maps of England, the water parting between the Mersey and Dee being invariably shown as a straight line running along the Dee coast of Wirral to Chester, instead of in the curving position here noted.

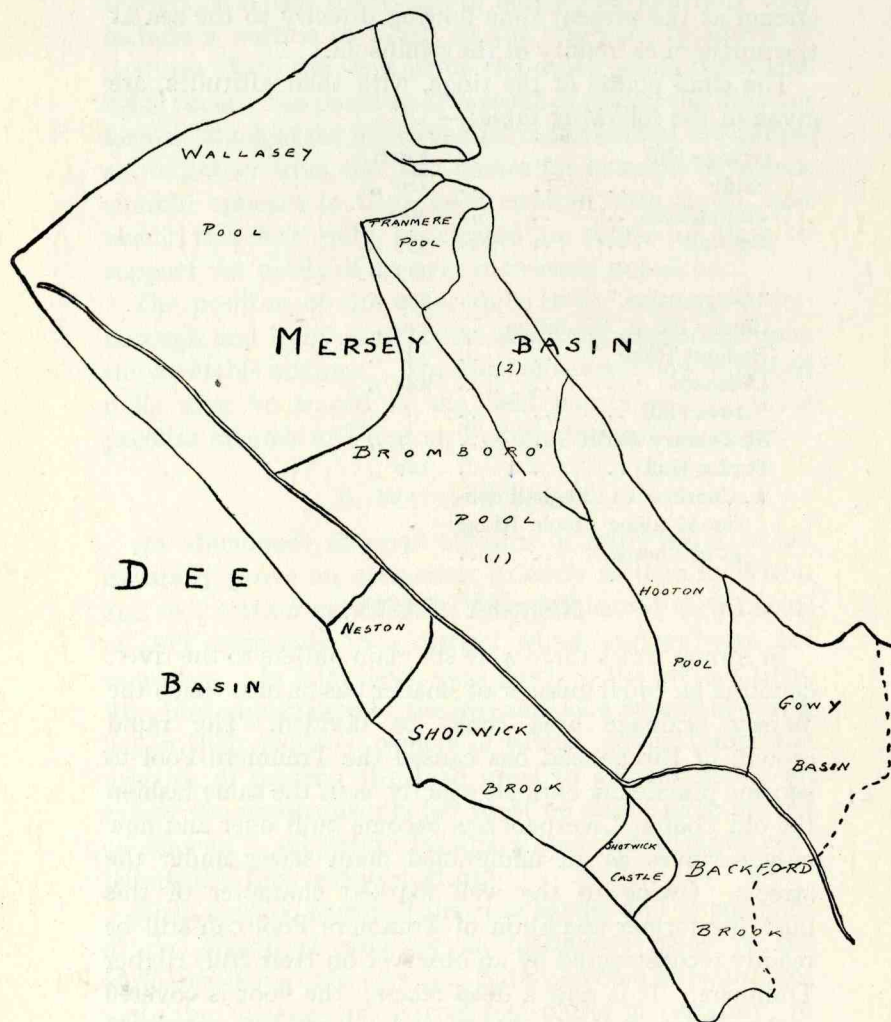


Fig. 5. The boundaries of the principal stream basins of Wirral.



offensive gas works, whose noxious effluvium descends like a belt of poison gas, upon the old sides of the pool, thickly plastered with small houses—one of the least attractive portions of Birkenhead. It was formerly a pretty valley through which the stream flowed past wooded banks, beneath the shade of the trees with abundance of primroses and cowslips, bluebells in the summer and in autumn a rich tangle of briar-rose and bramble.

Another minor outlet, that near Eastham ferry, will shortly be in a like condition due to extensions of manufacturing activity. The main outlet on this side of Bromborough Pool will, it is fervently hoped, be painlessly put to death. The slimy banks of a once beautiful curve are now occupied up to the railway by a hideous mass of soap, oil, and grease works, whose odour is a nightmare to those whose business carries them along the main Chester road at this spot, while the unfortunate people who exist near its banks deserve every compassion. Beyond the railway, however, the river valley forms one of the most delightful of Wirral beauty spots.

The streams draining into the Mersey are these:—

- |                     |   |                      |   |            |
|---------------------|---|----------------------|---|------------|
| 1. Wallasey Pool    | { | Caldy Brook          | { | Arrowe B.  |
| R. Birket           |   | Arrowe Brook         |   | Greasby B. |
|                     |   | Fender—Prenton Brook |   |            |
| 2. Tranmere Pool    |   |                      |   |            |
| 3. Bromborough Pool | { | Plymyard Dale        | { |            |
|                     |   | Dibbinsdale.         |   |            |
|                     |   | Raby Vale.           |   |            |
|                     |   | Hargrave Brook.      |   |            |
| 4. Eastham.         |   |                      |   |            |
| 5. Hooton Pool.     | { | Whitby Brook.        | { |            |
|                     |   | Sutton Brook.        |   |            |
| 6. River Gowy.      | { | Stanney Brook.       | { |            |
|                     |   | Thornton Brook, etc. |   |            |

## I. WALLASEY POOL AND RIVER BIRKET.

The river Birket, so called, has its source in the marshy land between the slopes of Grange Hill and the dune belt at Hoylake. Formerly, so far as we can at present determine, this marsh land must have been very similar to the East Anglian fens—a swampy low-lying area whose characters are perpetuated in the old name of Newton Carr. At the present time, though vastly improved by drainage and cultivation, in the winter much of this land is saturated with water and in wet seasons is flooded, just as the Stanney marshes.

Owing to continuous alterations of recent years it is exceedingly difficult to trace on the ground the original course of the upper portions of the river, which can hardly be said to possess a distinct character until we meet with it at Fornall's Green as a sluggish, canal-like stream whose flow is only faintly perceptible in the summer months by the waving, submerged vegetation.

In spite of the slight grade the bed is of some depth and it carries a considerable volume of water, its adequate maintenance being essential to the drainage of the region. Until its emergence upon the Wallasey marshes, beyond receiving many tributaries from the right bank, its course is singularly uneventful. The one-sided appearance of the drainage system, it may be noted, has been quoted in support of a theory that higher land existed to the seaward or left bank, and that with the submergence of the coastline region, tributary streams from this direction have disappeared. No verification of this has been obtained either from the present surface or from old maps, and it is unlikely (in view of the extensive building operations in the region) that any further evidence of the theory will be obtained.

Below Wallasey the river formerly emptied itself into a salt marsh at the head of the Pool. On this point we

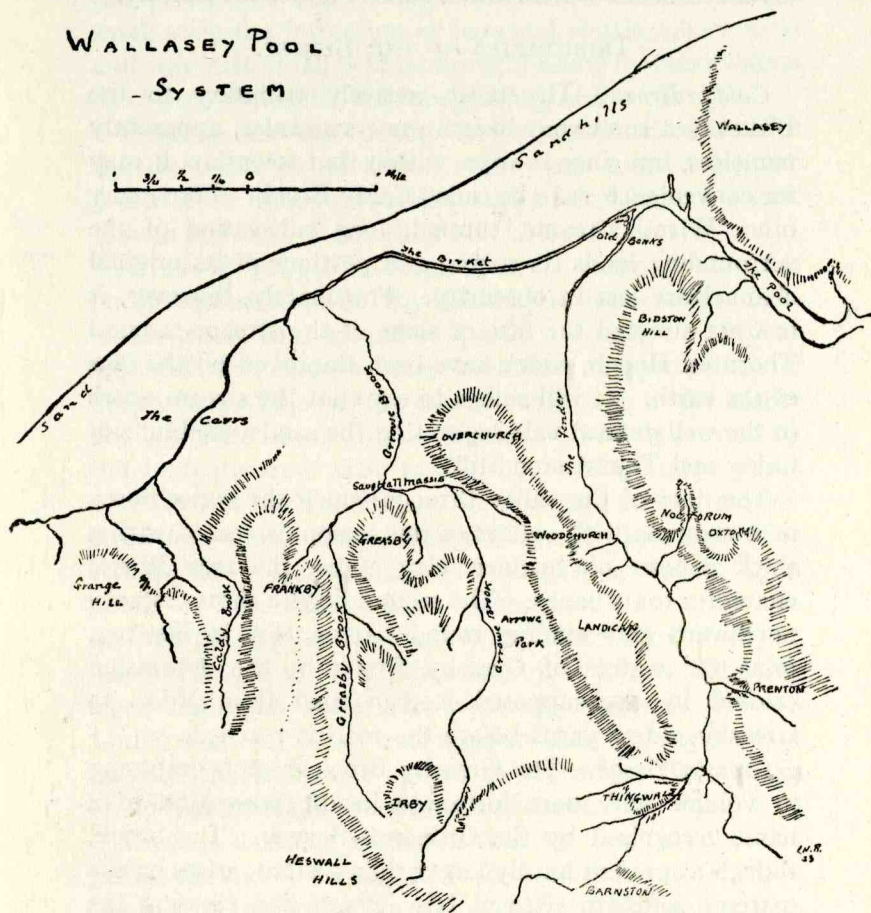


Fig. 6. Wallasey Pool and its Tributaries.



have adequate evidence. Fortunately many old maps and plans clearly indicate the previous condition of the region, which condition appears to have existed until the diversion of the waters into a culvert under the railway.

#### TRIBUTARIES OF THE BIRKET.

*Caldy Brook.*—The most westerly tributary to the Birket is a somewhat insignificant streamlet, apparently nameless, but since it arises within that township, it may for convenience' sake be called Caldý Brook. Like many other Wirral streams, through long cultivation of the surrounding lands its source and portions of its original channel are lost in obscurity. Fortunately, however, it has not suffered the fate of some of the streams around Thornton Hough, which have been improved off the face of the earth. It will suffice to say that the stream arises in the well defined vale separating the sandstone bluffs of Caldý and Thurstaston Hills.

The floor of the valley through which the water flows, as is common with valleys of this region, is coated with a thick deposit of boulder clay giving the true Wirral character to its banks. The stream flows a short distance northward and winding round Larton Hey in Newton, joins the waters of Greasby Brook in the depression crossed by the supposed Roman road from Meols to Greasby, a few yards before the road is reached.

*Greasby Brook.*—The Greasby Brook is more imposing in volume and more fortunate in the possession of a name recognised by the Ordnance Survey. The brook, though at present hardly larger than a ditch, arises on the extreme southern edge of Irby Heath and crossing the heathland its course is the better marked for the distinctive vegetation on either bank. On the left is a grove of overhanging birch trees on the edge of the moor grass slope ; on the right are the fields hardly won from nature sloping down from the pine-clad summit of Irby

Mill hill. The confluence of Greasby and Arrowe brooks near the footpath from Greasby village to that of Saughall Massie is an extremely characteristic and pretty sight, the volume of water being sufficient to illustrate on a small scale the formation of bars and shoals, where sand and clay with small pebbles brought along by flood waters have been deposited with the slowing of the currents.

Here too, the undercutting of the banks and removal of the clay can be witnessed, somewhat marred by the presence of numerous bricks and similar human relics; though how they found their way there is a mystery.

*Arrowe Brook.*—This stream has its source in the fields on the eastern slope of Irby hill, a little to the south of the moated hall, and meanders gently through a valley at first wide and shallow, later becoming steeper and more deeply cut. This feature can be easily seen in the earlier portion of its course from the point where it is crossed by the footpath from Irby to Pensby. (After a few yards over the hill towards Pensby the footpath strikes another streamlet which flows into the Fender system). The stream flows through an ever deepening valley, in a patch of woodland which terminates soon after the picturesque dip in the road from Thingwall corner; at which point there are indications of a former tributary from the right bank. It continues alongside the old Limbo Lane for about half a mile; then making a sharp angle with its former course is cut direct through an obviously artificially straight ditch to Arrowe Park.

There is a strong suspicion that the land around two pits at the end of the private road through Arrowe Park to the east or Limbo Lane was a collecting area for a stream which flowed in a pronounced valley on the left hand side of the road to Arrowe Bridge, passing in front of Arrowe Brook Farm and joining the other stream by the bridge. In view of the name of the farm house it seems probable that this stream was the original Arrowe Brook and that



instead of cutting across the fields and through the park the waters followed Limbo Lane along its whole course and then flowed along to the ditch mentioned. Beyond this appearance and the suspicious straight cut, no evidence has yet been discovered from old maps or documents previous to the last century. The stream has been partly dammed up to form a small fish pond with a waterfall at the outflow. In the wood below the fall from the dam, where the public footbridge crosses the stream the water flows over the bare smooth worn surfaces of the sandy keuper marls. This is notable as being one of the few places in Wirral where a stream is to be found flowing over a bare rock surface, the thickness of the overlying boulder clays and silts having prevented this phenomenon in the majority of cases. To this of course is due the absence of small waterfalls and other features associated with a rocky stream bed.

Leaving the park at Arrowe Bridge the stream pursues a somewhat sinuous course, passing under Upton bridge, Saughall Massie, and Moreton bridges; through this portion of its course forming the boundary between the parish of Upton on the right hand and those of Greasby and Saughall on the left. Before reaching Saughall Bridge the river receives the Greasby Brook tributaries; and thus amplified the brook finally reaches the Birket at Meolse.

A feature of both Arrowe and Greasby brooks is the peculiar convergence of their respective valleys from the west and east to the meeting of their streams, the subsequent course of the combined waters, now known as Arrowe Brook, being for some little distance at right angles to both valleys, the whole forming a T-shaped figure. Saughall Massie on the left bank still retains its country village appearance, due possibly to a position more isolated than its neighbours from the main roads. The whole picture owes a great part of its beauty to the



old stone bridge crossing the brook below the village. The stone coping overhung with trees seems to have a characteristic English appearance, while the sharp turn of the road sloping up to the houses also recalls the principle of maximum danger to fast traffic adopted by the majority of our country places.

*Fender.*—The basin of the Fender lies in one of the most prominent of Wirral valleys, between the western escarpment of Bidston Hill and the eastern slopes of a lower but well marked ridge commencing at Overchurch and running almost due south to Thingwall and Pensby. The head of the stream system is somewhat complicated. It is hard to decide which of the two streams is the mother of the Fender brook, the eastern branch rising below Storeton or the western branch from Pensby.

The latter branch becomes visible in the fields below Pensby Hall, a little to the N.E. of the farm buildings. Cultivation, however, has obliterated the stream until Pensby Lane is reached. From here the stream runs in an easterly direction and enters a deep gorge.

After centuries of denundation by the weather and corrosion by the stream itself, the glacial deposits have been removed from the sides and bottom of the valley, and the stream wanders over an alluvial flood plain deposited directly on the surface of the upper soft sandstone of the Bunter series. A few yards from the head of the dale the traces of another tributary from the south can be distinguished, the combined waters flowing at the bottom of the beautiful Barnston Dale.

It is interesting to notice that both here and a little down stream by Thingwall Common, the water eroded through the clay down to the rock base of the valley has entered upon a phase of deposition, and now flows in a miniature flat of its own making. This feature is evidence of the former existence of a much greater volume of water, such as is indicated by the deeply cut Barnston

Dale. Since that period the volume of the stream has diminished, this resulting in the deposition of sediment. A still more recent deposit on the right bank of swings and toboggans proclaims Barnston Dale one of the beauty spots of the district.

Opposite these beautiful objects a small tributary comes in, by way of an iron railing on the left bank. This tributary, rising near Elms farm, Pensby, has in the past cut a deep cliff to the south of Thingwall Common, and at its confluence with the main stream has deposited an interesting miniature sand-bar, which may be picked out in the gaps between the tin cans and other refuse. The stream now forms the eastern boundary of Thingwall township until joined by a small tributary, again on the left bank, proceeding from the east of Arrowe Park.

At the junction the combined waters receive the name of Prenton Brook on the Ordnance maps. From this point the stream bed is no longer cut in the rock but lies in an alluvial plain deposited on the boulder clay, the alluvium steadily increasing in width until it joins that of the Bidston Marsh. A few yards down stream, Prenton brook is joined by a tributary on the right bank. This branch rises in the rough ground round Rake Hey covert, Storeton, only a few yards away from the source of the Clatterbridge stream flowing into Bromborough Pool. The nearness of these sources was the cause of a curious error in the past. In some maps published early last century these streams are joined, thus making all the land to the east an island. A little careful inspection of the spot would have revealed the non-existence of this connection and avoided a ridiculous error.<sup>1</sup> This small tributary forms a pretty example of an open clay valley, between its source and the deeper valley in Stanley Wood by the railway, and fortunately can be easily seen before

<sup>1</sup> A similar observation might be made regarding the two streams shown on early maps as connecting the Mersey and the Dee in the Broxton Valley.



reaching the road. Just before reaching the footpath from Storeton to Thingwall the clay banks become more precipitous, the stream flowing from 10-12 feet below the level of the fields. In wet weather these banks are particularly treacherous and difficult to negotiate, as the rambler will soon discover should he prefer the footpaths to the highroad.

Two minor tributaries, one of which forms the south boundary of Prenton township, enter upon the right bank of Prenton brook before the confluence of an interesting little stream from Prenton. This stream, now almost extinct, formerly originated to the S.E. of Mount Pleasant in Prenton and flowing along the northern boundary of a field now converted into the golf course, crossed the road and entered the head of Prenton Dell. The valley, well wooded until a few years ago, terminated somewhat abruptly where the stream flowed into the alluvial flat of Prenton brook (the Fender), just where the railway embankment cuts into the path.

It is of interest to note that in the Domesday Survey of Wirral a mill, *i.e.* a water mill, is mentioned in Prenton. Mr. W. F. Irvine was the first to notice the peculiar bank at the end of the dale, now broken in two places, and to suggest that this possibly was the site of the mill mentioned. I have more recently examined the spot carefully and think there is little doubt that this bank is of artificial construction, and it seems reasonable to conclude that it represents the remnant of the ancient mill dam. Standing at the head of the valley towards sunset it is possible for the eye of a believer to distinguish a short ridge down the side of the valley denoting the former water-level of the water in the dam. However this may be, this is the only possible site for the mill dam within the township of Prenton, so that it does not seem to be stretching the facts too much to conclude that the Dell was formerly the site for the mill dam.



From this point to the confluence with the Birket at Bidston the Fender meanders peaceably through the flood plain, here and there cutting into the boulder clay; as the water swings from side to side the valley becomes broader and shallower until it merges almost insensibly into the Marsh.

2. Tranmere Pool, as related above, has disappeared.

### 3. BROMBOROUGH POOL.

The system of tributary streams draining into the tidal creek of Bromborough Pool is, both by virtue of its complexity and area of drainage, second only to that of Wallasey Pool. The water supplies of the basin are drawn in general from a semicircular area bounded by Prenton to the north, the eastern Heswall-Hinderton ridge, and somewhat vaguely in the south by the higher portions of the central plateau near Ledsham. The streams finally meet in a deeply cut valley at Poulton and flow in a north-easterly direction into the tidal mouth of the pool. Probably by reason of their greater volume the streamlets of this system have suffered less by agricultural operations; though some portions, notably near Willaston, have been grievously mutilated. One minor branch to the south of Willaston station, though accorded a place on one quarter-sheet of the six-inch map, is not to be found on the next sheet, the water having been taken underground near the railway during the drainage operations.

The most northerly of the tributaries rises from the southern slopes of Prenton, one branch coming from the edge of Mount Wood in the boulder clay vale dividing the Quarry hill from Storeton village. The upper end of this vale resembles that of the Fender on the northern side of the Prenton Knoll and is by nature somewhat marshy in character, though its condition is being steadily improved by drainage.



Before reaching Clatterbridge the stream is joined by the Brimstage Brook, another of the streams rising on the slopes of the Heswall hills to the east. This stream has given rise to an extremely picturesque ravine in the neighbourhood of Brimstage, the houses and old hall having been formerly grouped on either side of the sandstone cliffs through which the water runs. Unfortunately the village has fallen a prey to the "artistic" garden city idea, the old inn and cottages having been destroyed and a row of villas set back from the road on an avenue lined by trees in the approved style. The property however, even in this short period, is showing signs of wear and bears an even more dilapidated appearance than the former cottages.

Leaving Brimstage this tributary again flows in a clay valley until its junction with the northern branches from Storeton. From Clatterbridge a wide valley has been cleared of clay, exposing the coarse, hard sandstone over which the waters flow until just a few yards from their junction with the streams flowing below Raby Mere, where they have commenced the deposition of alluvium.

The next tributary suddenly appears from the ditches of Thornton Hough and soon afterwards flows in a sandstone valley of its own making, here and there depositing alluvium. It meets the northern streams below the mill dam.

A stream arising in the fields to the south-west of Willaston mill flows through a characteristic marshy clay valley through the township of Raby, and has in the past excavated a deep valley, crossed by Raby Hall road, one of the steepest roads in the peninsula. To the damming up of this stream is due that famous, picturesque sheet of water, Raby Mere. The name, of course, implies no relation with the Cheshire meres formed in entirely different fashion. In origin Raby Mere is entirely artificial, being formed by the construction of a mill dam



across the lower end of the stream valley; this resulted in the filling up of the stream banks, their place being taken by a glorious sheet of water, its irregular margins surrounded by trees, save only along the lower end, where a road bounded by an old low sandstone wall crosses the dam above the mill.

So far no modern villas have been erected to destroy the delightful picture of the banks of the mere. The old cottages still exist with relics of their old-world gardens; one high up above the road, its sweet green turf bounded by masses of delicate blue violets at the base of glorious roses and shrubs; another below the dam, surrounded by trees, within earshot of the music of the escaping waters, rustling past the house. But in summer this pleasant sound of running waters is lost in the roaring of the pleasure seekers, who flock in hundreds to this glorious spot on foot or by cycle, motor or even charabanc. Any week in the "season" the place is packed with people, so that the murmur of their voices can be heard afar off, and the solitary pedestrian seeking only the company of nature will if he be wise retrace his steps to some other spot, not so greatly favoured by the multitude.

This season's influx is not without its aftermath; for the ever-increasing stream has brought destruction in its wake, as at Irby, fences of odious barbed wire, and warning signs, the growth of sheds and out-buildings; flaring notices hang strangely amid the greenness, while swings and automatic machines minister to the needs of that unfortunate section of the populace unable to enjoy nature without these little refinements to while away the tedium of the summer afternoon. But in the evening when the crowds have departed, the owl-light descends, shutting out the sun through the slowly closing gates of day. With the rising of the creamy moon, it is then that the Mere appears in its full beauty, under the ruddy light of the harvest moon or the cold gleam of the wintry sky,

the mirror of the waters arising vaguely from its shadowed banks, ruffled into glistening ripples by the glancing breath of the evening breeze. Then the thunder of the escaping waters can be heard leaping down the gorge below the dam. The fields quilted with a shimmering coat of misty dew, look like the delicate first snows of winter; the moonlight, casting its speckled shapes through the leafless trees on the whitewashed cottage walls, converts them for the nonce into dream palaces of old.

Below the dam the escaping stream flows through a short gorge into a deep valley, where it joins the main body of the northerly tributaries and falls into Dibbinsdale nearly a quarter of a mile south of Poulton Launcelyn, there effecting a confluence with the body of the southern streams now to be described.

The southern portion of the deep valleys of this system is known as Plymyard Dale, formerly almost as well wooded and picturesque as Dibbinsdale is in the latter portion of its course. The southern waters are derived from two main streams together with several minor streamlets whose courses have been almost obliterated.

I have been able to trace the main branch of these waters to within a short distance north of the slightly elevated village of Ledsham, where only in winter or in seasons of much rain is there sufficient quantity of water to indicate its general direction of flow. Although this portion of the stream (and later near Ledsham Station the course of the drainage) has been so altered, not so much by the normal process of agriculture as by the cutting of the railways and roads, that the original channels can only be deduced from the disposition of the surface features and the like; notably the upstanding knolls of Ledsham and that peculiar patch of high ground near the Sutton Hall farm.

To wander from the subject somewhat, it has often



appeared to me a great pity, from the standpoint of geography, that the Ordnance Survey have not yet formed the agreeable habit, in Cheshire at any rate, of sketching in the 25-foot contour level on the six-inch maps as is done on the Survey maps of U.S.A., thus obviating much trouble and inaccuracy to the subsequent users of the maps. In a case like the present, such details would have been of enormous value in the correct description of the surface features.

From Ledsham station, save for an isolated few yards, the course of the streamlet is again somewhat obscure until Childer Thornton is reached. Here it is probable a considerable stream entered from the west; arising from several small streamlets at the edge of the Mersey watershed beyond Thornton Heath, it has been traced with difficulty to within a few yards of the Willaston branch of the G.W.R. Here the typical boulder clay valley of Wirral is fairly well marked. Passing under Hooton Bridge the stream can be traced throughout to Eastham Rake, where the deeply cut ravine at the top of Plymyard Dale is entered. The contours and general position of the vale between Childer Thornton and Hooton Park also suggest a former stream of some importance, having its source on the watershed between this system and the Overpool valley; a straight ditch and a boundary line also appear to corroborate this circumstantial evidence. This stream would have flowed past Woodside nursery following a curve parallel to the road through Hooton Green, being joined here by a tributary from near "David's Rough," suggested also by a boundary at this point; the combined streams continuing in the approximate line of the road and joining the main stream near Hooton Bridge.

A few yards below the Wirral Council Sewage Works, and on the opposite side of the Hooton main G.W.R. line, a tributary stream comes in on the left bank. This branch arises in a slight depression in the fields a few yards



from the south of the Hooton-Willaston road and flowing under the road by a sunken drain deepens its valley fairly rapidly in the neighbourhood of Street Hay, turning to the west to join the Plymyard Brook.

From the upper end of Plymyard Dale to the meeting of the waters at Poulton, and thence to its meeting with the tidal waters after its escape from the Spital Mill dam, the valley of the stream shows several typical changes. Plymyard Dale and the whole of the streams before the Poulton gorge may be taken to represent the point in the valley tract where the forces of corrosion are in the ascendancy; while from one extremity of Dibbinsdale to the other a continuous transition in the attempt to form flood plains can be clearly seen. The meandering of the streams in their upper reaches is hardly represented on the six-inch map by virtue of their large number and small size, for the same reason that we are assured by mathematicians that any circle or curve can be conceived as made up of an immensity of small straight lines imperceptible to the human eye by reason of their minuteness. Lower in the valley course the meanderings are observed to be very small, yet in relatively large numbers, as above Poulton. Lower still they become fewer and fewer, and each one is larger and broader than before in extent, ever shifting and tending to widen the steep sides of its valley by lateral planation till both meanders and valley plain are submerged by the tidal waters of the drowned pool, where at low tide the alluvium is overlaid by a deposit of tidal silt together with industrial refuse.

From our exceedingly scanty historical evidence it seems probable that the tidal influence was extended as far up the stream as Poulton, and to it we may perhaps attribute some of the widening of the valley; but until further geological evidence is forthcoming it would be unwise to speculate upon the topic. It has been asserted by one authority, a strong opponent of the subsidence

theory, that as the tide formerly extended up to Poulton, as indicated both by its name and its situation at the first fordable portion of the creek, and as the tide no longer flows up to this extent, therefore the land is rising.

Yet another tributary to this system remains to be described: a stream now almost completely obliterated, at the head of the pool. The tracing of its course is only possible nowadays by the topography of the region in question, aided by existing ditches in the upper part of its course and by the boundary between the borough of Birkenhead and the township of Higher Bebington. It most probably arose on the eastern slope of Mount Wood near the pumping station, excavated a well marked valley in the clay from below Cavendish Road and followed almost parallel to the line of the Old Chester Road through Bebington station, flowing into the plain of the Pool between Lower Road and Windy Bank.

#### 4. EASTHAM BROOK.

This is a minor stream rising in some ponds in "David's Rough," a small plantation on the watershed between the Bromborough Pool system and that of the present streams; it flows past the eastern boundary of Gray's wood and so to the Mersey, having its former outlet near Eastham Locks in the Ship Canal.

#### 5. HOOTON POOL.

This is another important drainage system of which the name, if ever known, is now forgotten; for the present purposes it may not inappropriately be named Hooton Pool. Though of comparatively small area in comparison with the Bromborough or Wallasey systems, the Overpool valley is the finest example in Wirral of a boulder clay valley excavated by stream action; in it the typical form characteristic of the region may be studied with the greatest freedom, the valley being readily accessible to the public by many convenient foot-paths and byways, and



except near its source the original course of the stream is probably unaltered.

The main volume of water has two distinct main origins. That in the south-west comes from a somewhat vague line of ditches at Capenhurst flowing under the Great Sutton-Chester road at Damage bridge (No. 2), receiving a tributary on the left bank from the base of the Sutton Hall ridge, crossing two lanes a bare furlong apart by means of an old-time ford. One of these fords it was my misfortune to meet with after a few weeks of wet weather; the foot bridge having disappeared, an undignified scramble across a rickety fence was necessary in order to avoid an unpleasant wade over the stones. Since then my respect for these mere Wirral ditches has increased.

The south-east branch arises to the north of Strawberry farm, below the main Dee-Mersey water-shed, and though constrained to ditches makes an exit a few fields above its meeting with the other branch. The field in which this confluence occurs is (or was) open to view by the foot-path crossing the stream by a foot-bridge, from which the minute meanders of the stream cutting a gorge about a foot deep, the erosion of one bank and deposition on the other are well displayed, as is also the "bar" formation at the meeting of the streams. Below the bridge, the stream enters a well marked depression in the boulder clay on both sides of the railway embankment thrown across the steeply sloping valley. The course of the stream is very clearly marked.

#### THE DEE BASIN.

On the western side of the peninsula the streams are usually extremely short and of little consequence. A few small brooks hardly better than drainage ditches trickle down through small gullies in the clay cliffs draining across the sand and mud, the silted up remains of a once magnificent estuary.



SHOTWICK BROOK.

The most remarkable of these western streams, Shotwick Brook, is however a notable exception to the general rule. Arising in the heaths around the south of Neston, from a mass of small ponds lying in a deep valley of peaty clay, separating the sandstone ridges of Hinderton and the "Gorstons," intersected by the high embankment of the G.W. line from Hooton to West Kirby; the stream pursues a course parallel to and only a few yards from the Chester-West Kirby Road.

Leaving this pronounced depression and collecting further supplies while flowing through the "moss-land" of Ness plantation, it appears as an ordinary drainage ditch, though carrying a somewhat greater amount of water than is usual. Its insignificance amongst streams may be judged by the fact that is apparently not even worthy of forming the boundary line of the Dee-fringing townships, their limits being carried a field's-length further inwards to the line of the main road.

After flowing under the Puddington road near Badger's Rake, however, the stream forsakes its ditch-like regularity, doubtless forced upon it through cultivation, and curving south-westward enters upon a phase very similar to that found in the Overpool valley region, curving its way through long fields, occasionally spreading outwards into a swampy sheet, notably where the footpaths from the Queensferry Road are supposed to cross, and finally with much noise and clatter plunging through the upper end of Shotwick Dale at its second meeting with the Queensferry Road.

The beauty of its deep cut richly wooded banks, similar to those in Dibbinsdale or Barnston, render Shotwick Dale one of the most interesting the Hundred possesses, if not the most beautiful of them all. On reaching the village of Shotwick the brook appears to attain its former base line of erosion, that, until the

reclamation of the Dee flats took place in the early eighteenth century; the stream managing to struggle with some difficulty under the old Shotwick Bridge on the lane leading to the marshes below the old church. In winter, however, the brook shows a tendency to imitate what was probably its former condition, that of a creek or pool similar to those along the Mersey. In view of the fact that Shotwick was formerly a fishing village, and of the old tradition that ships used to anchor there in its shelter from the stormy waters of the Dee, which at one time came within a few yards of the old church on the cliffs when the sea flowed to the very walls of Chester, some support is gained for the view of a former drowned river valley.

At the present time the brook is carried across the marshy reclaimed ground to the artificial Dee channel by the iron works near Queensferry. Shotwick village is one of those old-world villages left in a backwater by the advance of civilisation and is one of the most illuminating examples of the effect of position upon local history; an old straggling village, whose main street is little better than a byway; quaint houses, all curious corners and angles; the little brook along the side of the road kept within bounds by stone slabs, whilst similar slabs stretch the span opposite the house doors; where geese wander at their own will anywhere over the roadway, threatening the approaching stranger with strident cries and militant gestures. Below on the old cobble pathway leading over the bridge, the quaint shapes of willow and osiers line the pools on all sides. All is peaceful and rural. Down there one is reminded of the flatness of the fen country or the sweet meadows through which the Cam lazy-flowing meanders along, scarcely shivering the reeds, as though reluctant to leave the enchanted spot for the noisy play of the open sea. To think of this being a port, a military embarkation station, a place now so inaccessible that even



tourists are a comparatively rare phenomenon! Such is the see-saw of time.

Above Shotwick no streams of any size or importance occur, except the twin guardians of Shotwick Castle, until the notable valley forming the southern boundary of the Hundred is reached. The chief feeder to this system is Backford Brook and its tributaries.

*Backford Brook.*—The main stream first becomes distinct in the neighbourhood of Dunkirk, a little to the south of the site of the ancient manor house of Capenhurst. Quite possibly a spring now concealed fed the moat, still to be traced under the smothering vegetation, and its overflow gave rise to the stream, which flowing southward forms the eastern boundary of Lea. Along the western boundary of the same township a tributary stream, first revealed in Powey Lane plantation, flows south for about a mile; then turning abruptly eastwards is joined by a minor streamlet from the north and trickles into a prominent dale, meeting here the main stream. The wide valley has been excavated by these streams, lined by glacial sands, here occurring a few feet below the clay surface. This is evidence of the former volume of the streams. Nearly a mile in length this valley finally joins the prominent and well known Broxton Valley, the subject of so much careless argument and discussion.

Although the former courses of the stream in this valley are to some extent obscured since the cutting of the Shropshire Union Canal, a brief examination is quite sufficient to dispel the erroneous opinions which since the days of Ormerod have been put forward concerning the excavation of the valley. Ormerod, living at Chorlton Hall, a few yards from the edge of the valley, suggested, from the appearance of the sand and marine shells found on the banks, that in former times the River Mersey flowed southward through this valley to a junction with

the Dee above Chester.<sup>1</sup> This suggestion was in the first place due to the apparent omission (on mediæval copies of Ptolemy's map of the coast) of the estuary of the Mersey. That the Mersey estuary ever was omitted is still doubtful; but even so, it was difficult to imagine why the Romans should not have utilised the Mersey instead of confining their attentions to the estuary of the Dee. Hence the supposed necessity of finding another exit for the Mersey.

Unfortunately for this theory, a little closer inspection of the valley between Wervin and Chorlton will reveal the presence of a prominent watershed approximately 40 feet above sea level. Further inspection will show traces of the former presence of *two* streams; the one rising within Wervin township and flowing north-east to join the Gowy and eventually the Mersey, and the other, a few yards below this, flowing south-west and joining Backford Brook. Regarding the marine shells, possibly those seen by Ormerod were those from the glacial clay which competent geologists state were brought in, together with the clay, by ice action in the glacial period. The sands are probably also the middle glacial sands of frequent occurrence in the neighbourhood. Ormerod<sup>2</sup> certainly withdrew his earliest statements, but writers<sup>3</sup> since that date have apparently neither seen this withdrawal nor taken the trouble to inspect the spot in question.

The junction of these two streams, as shown in Speed's map of 1610, and later copyists, is thus clearly shown to be an error. It is quite possible that the tide may at times, before the silting of the Dee, have approached Backford, but for the rivers Mersey and Dee ever to have communicated along this valley would have necessitated the submergence of a great portion of Wirral by 50 feet, during Roman times; obviously an untenable theory.

<sup>1</sup> Ormerod, *History of Cheshire* (1819), ii, 351.

<sup>2</sup> *J. Chester Arch. Soc.*, 1854, iv, 467.

<sup>3</sup> Ashton, *Evolution of a Coast Line* (1920), 119. Hewitt, *The Wirral Peninsula* (1922), 18. Budden, *The Beauty and Interest of Wirral* (1922), 15.



Below Mollington Bridge, an important tributary stream of some length comes in on the right bank. Rising below Two Mills (on the Chester Road) this stream forms the boundary between Capenhurst and Great Saughall, Mollington, and later of Little Saughall. Just before joining the main stream it receives a tributary stream helping to define and defend a neck of land on which stands Crabwall Hall, almost opposite the moated site of Mollington Banastre.

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#### APPENDIX.

The ability of a stream to carry the *detritus* formed by the weathering of rocks within its basin has been found to vary as the sixth power of its velocity. The velocity depends upon both the steepness of the channel and the volume of water. Hence streams must vary greatly in velocity throughout their courses.

Russell in his *River Development* (1898) distinguishes three stages, more or less distinct, into which the course of any river or stream may be divided:

- (1) The mountain tract.
- (2) The valley tract.
- (3) The plain.

1. *The Mountain Tract.*—In the earliest stage in the life history of a stream, the surface trickles unite until a considerable body of water has collected, the pace increasing rapidly as the stream descends and gathers its supplies from the upper portions of its basin; carrying by virtue of its velocity a heterogeneous assemblage of stones and gravel, sand and silt, and hurling them after a brief space into the valley tract, or often (with very young streams) into another river or the sea. This characteristic phase is usually only seen in hilly country, and is further marked by the extraordinary fluctuations in the volume of the waters, which suddenly arise in wet seasons or by the melting of the snow, discharge their burdens and then subside to a mere trickle or cease entirely.

On occasion this phase may be interpolated in the course of a stream by the water striking a band of softer material, or by plunging over the edge of a cliff into the sea or directly on to the plain.

Several examples on a small scale occur in Wirral, noticeably along the Dee estuary. Near Dawpool, where the coast is fringed by steep clay cliffs, the streams hurling themselves over have cut

back deep ravines, whose bottoms are lined with stones exceptionally large for the capacity of the present volume of waters. Further south, between Shotwick and Blacon Point, the streams falling over the cliff edge impinge upon the saltmarshes, the alluvial plain of the Dee, and cause the deposition of "alluvial cones" or "fans." These are of great interest; for, as, previously pointed out by the Geological Survey in 1912-13, a careful measuring of them would enable us to calculate the approximate age of the marsh itself and thus afford a valuable check to the conclusions drawn from old maps and the few documents available.

Those peculiar steep ravines found below Thurstaston and Heswall hills, cut out of the sandstone rock, were probably formed in the first instance by the action of swiftly moving streams in times of torrential rainfall, though no trace of a stream can be seen at present.

2. *The Valley Tract.*—Here the speed of the stream is gradually diminished and much of the burden is dropped. In times of flood the debris from the mountain tract is carried further down the valley and there in great part deposited. Hence we find here and there a flood plain, or successive levels may be traced telling the tale of past floods. The valley tract is broader than the preceding, the sides sloping more gradually and bordered here and there by flood deposits, until emerging almost insensibly into the plain; where the mature stream meanders.

3. *The Plain.*—Peaceably on a slighter gradient the stream flows through a plain of its own formation; normally a clear and sparkling rivulet, only the winter with its heavy rains disturbing its earlier tranquillity. The broad curves so typical of this stage produce many minor modifications of the stream course, for the bank will be eaten away slowly on the one side and the products deposited as banks or shoals on the other, so that in time the course may shift from one side of the valley to the other.

All three stages in stream development may be seen in Wirral, in those dales above Poulton where in past years the waters have eroded their way down through the coating of clay to the rock beneath and in succeeding years covered the rock up again (except on the steeper banks) with layers of alluvium. The broad plains of the Fender and the Birket were, until drainage operations straightened out their courses, typical examples of the last stage of a mature stream. For it may be noted that the age of a stream may be roughly calculated from the appearance of its banks. Its profile, at first sharply V-shaped, becomes smoother and more



U-shaped; finally broadening and flattening to a wide saucer-shaped depression.

#### THE BIRKET.

Regarding the name of this stream, called by Mortimer "Birken" and by later writers "the Birket," there has been a considerable amount of controversy. It has been asserted by some that the name "Birket" was invented by the Ordnance Survey. So far from this being the fact, the stream was called, on the one-inch map, 79, N.E., dated 1839, "the Main Fender" but on a subsequent edition in 1872, the stream is named the "Birket."

On enquiry the Director General of the Ordnance Survey informs me that the name "the Birket" was given to the stream flowing from West Kirby to Wallasey Pool, on the authority of the Rev. W. C. Graham of Bidston; Mr. Sutton of Reeds' Farm; and of Mortimer's *History*, previously mentioned. Furthermore, the name was again authorised at the time of revision in 1908 by Mr. Peter Stephen, of Mollington, who wrote:—"The Birket was diverted when Wallasey Pool was made a dock in 1842, since which date it follows a straight cut to a great culvert under Beaufort Road."

In a "Rental of the Earl of Derby's property in Wirral, 1521-2," printed in the *Cheshire Sheaf* (3rd Series, iv, 37), are mentioned "Certain profits issuing from a fishery in the water of Ayne, called Dowble Dyke." Mr. W. F. Irvine, who printed this document, considers that the word "Ayne" is the Celtic word "afon or avon," meaning water; and that this name here refers to the present Fender or to the Birket. Which of these two streams bore the name "Ayne" is doubtful, since both of them met at the "Dowble Dyke," marked on the original inch Ordnance maps as "Old Bank."

I have heard that skulls, etc., were dug up in the space between these banks, but have no confirmation of the report; neither is there any record in the name-book of the Ordnance Survey.