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INTRODUCTION

In November 1975 and late December 1975 this survey was carried out on the River Meon in Southern Hampshire. The aim of the survey was to take measurements of the river as it progressed towards the sea. At each point the depth and width were taken and at most points the speed. Also physical conditions which affect the river were noted. Thus it was seen why the river changed and by how much it changed.

Therefore it can be seen that the purpose of the survey was to give a factual description of the river as it progressed towards the sea.

POSITION

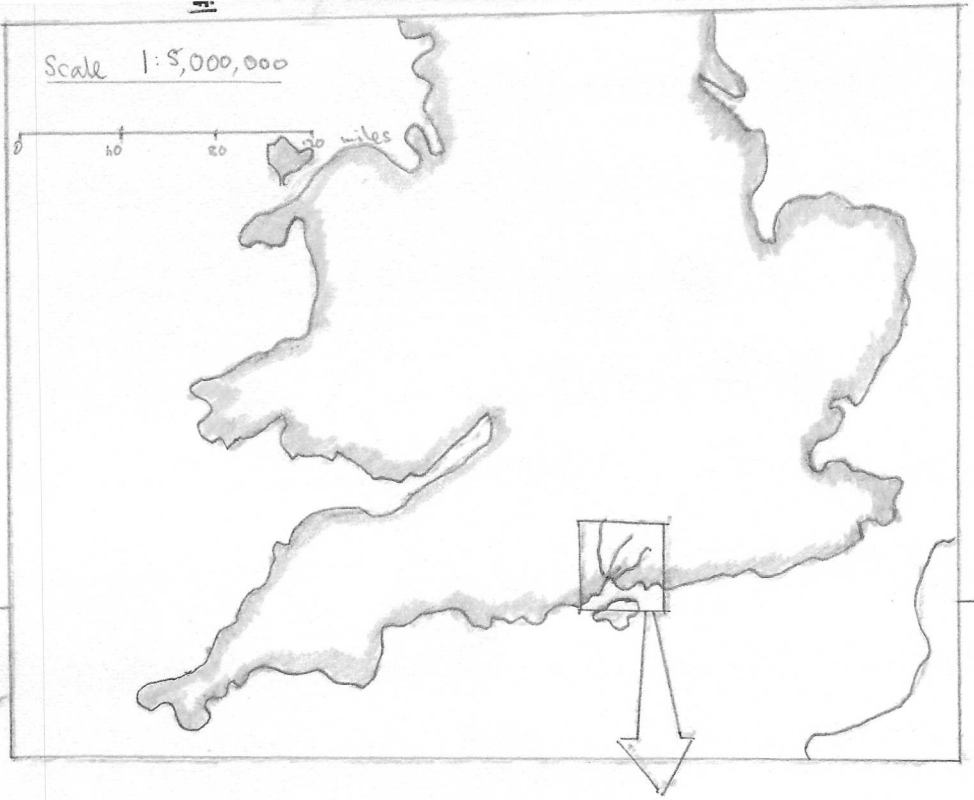
The River Meon is located in Southern Hampshire. It is one of the four rivers that flow into Southampton Water, the others being the Itchen, the Test and the Hamble. It is the third largest of these three.

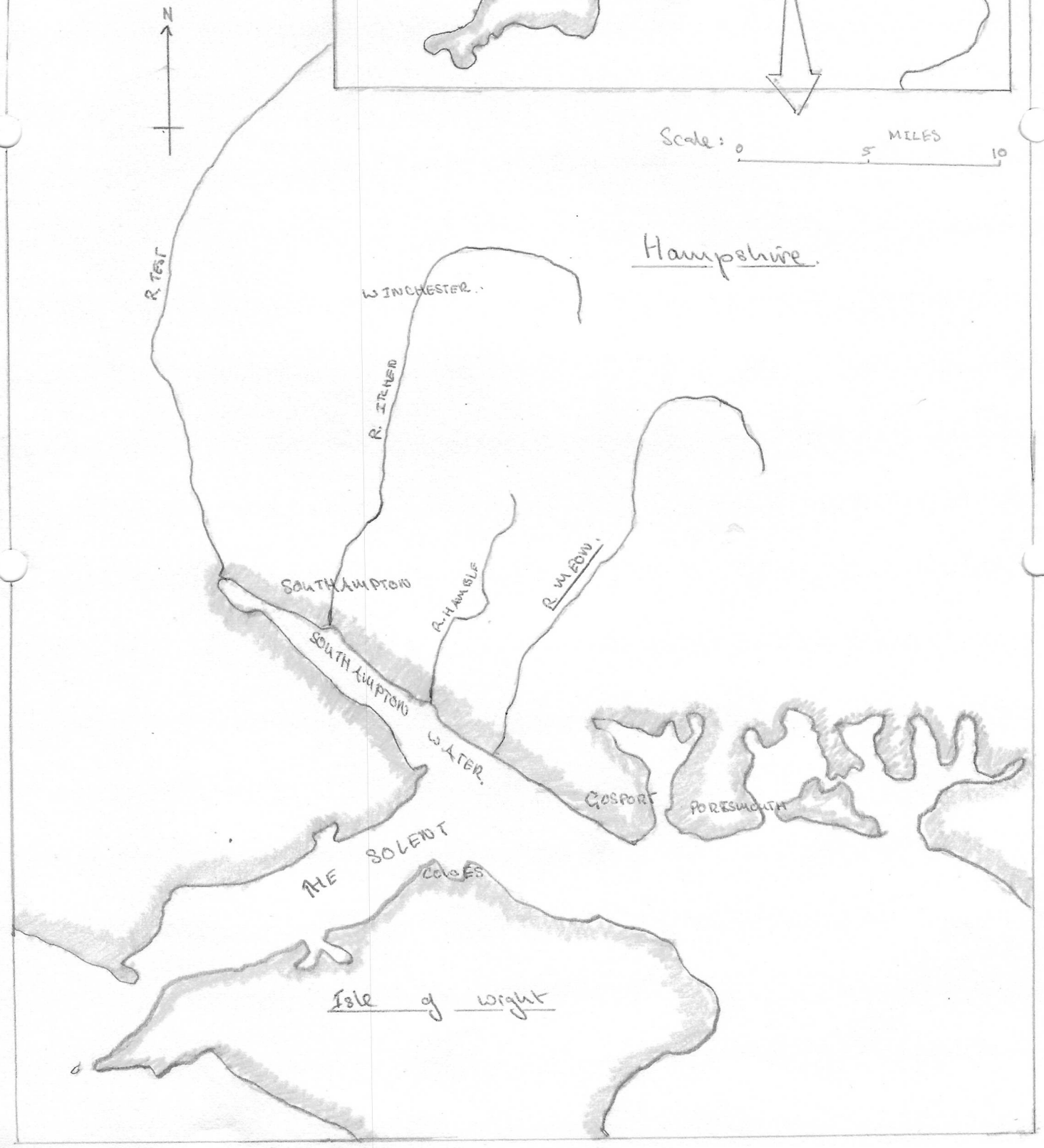
The River Meon rises in the high buttress of the Hampshire downs beyond the small village of East Meon, and it enters the Solent at Titchfield Haven about twenty-three miles further. During its course to the sea it meanders down a wide marshy valley going through several villages which have been inhabited since the dark ages. These villages grew up as either farming communities or as suitable crossing points on the river. The settlements from north to south are:- East Meon; West Meon; Warnford; Exton; Corhampton; Meonstoke; Droxford; Soberton; Swanmore; Soberton Heath; Wickham; Titchfield.

The river is about twenty-three miles long and it flows down a wide valley on its way to the sea. Its depth and width varies as it goes towards the sea and so does the volume of water.

Just above Titchfield the river splits into a canal and a smaller river. The River Meon used to be much bigger and ships were able to sail up to Titchfield which was then a major port. In the 16th Century the Earl of Southampton, wanting to make Southampton more important, drained most of the River Meon into this canal and so crippled Titchfield as a port.

The Location of the River Meon in Hampshire.





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Geomorphology of the Mean Valley.

PHYSICAL GEOGRAPHY OF THE MEON VALLEY

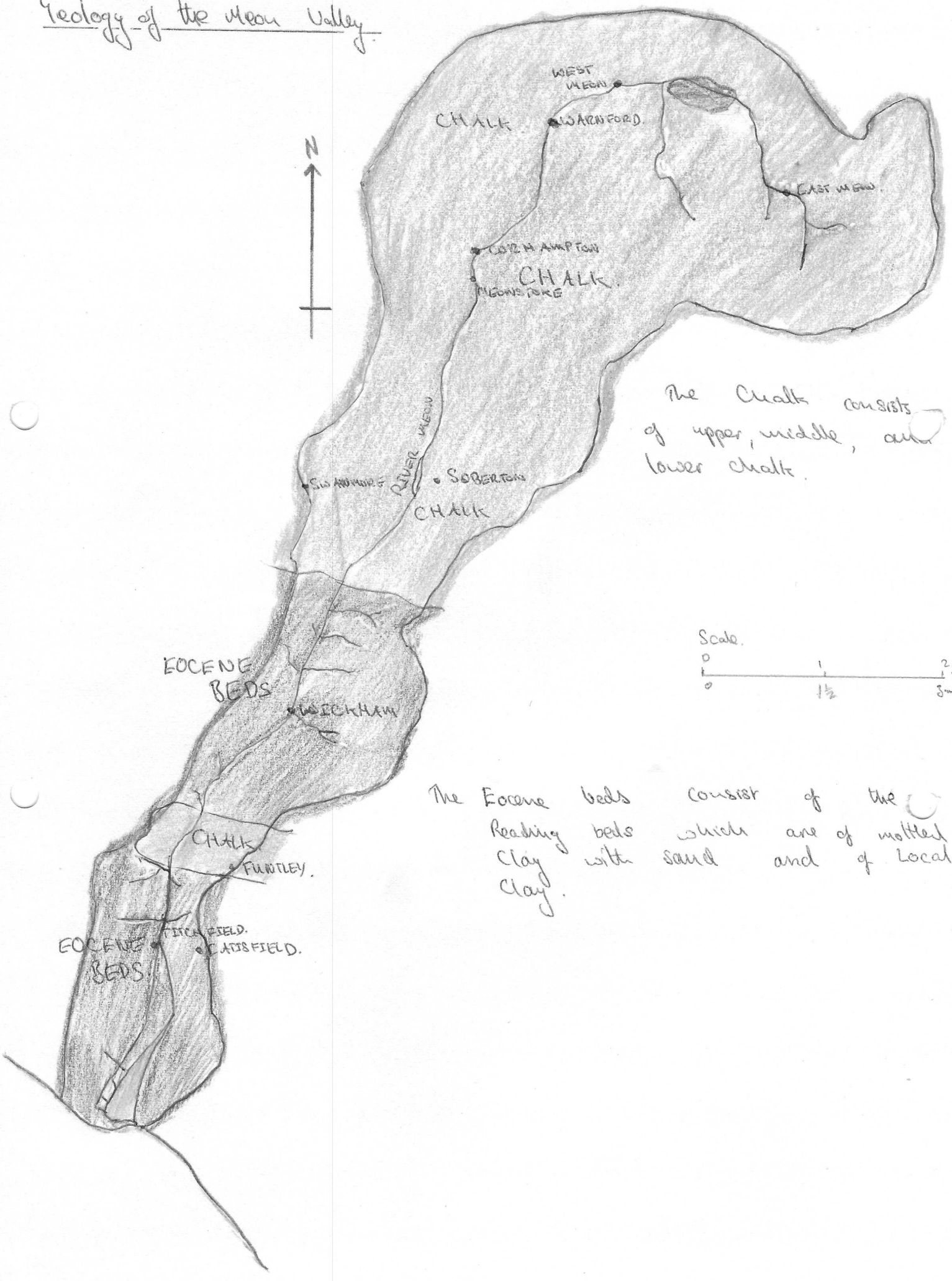
THE GEOMORPHOLOGY

The geomorphology of the Meon Valley can be divided up into three sections, or stages; the upper stage, the middle stage and the lower stage. The upper stage stretches from the source down to the end of the chalk hills just south of Soberton. Here the steep slopes of the chalk hills end and open out into a wider valley. Previously the river has flown down a wide valley which is connected to many dry valleys. (See map). The course of the river is northerly to start with but slowly its direction changes until at Warnford it is flowing south.

The middle stage is from south of Soberton until Titchfield. Here the river flows down a fairly wide valley but at Wickham the valley gets noticeably wider and flatter. The valley continues to widen below Wickham and a dry valley links the Meon and Hamble Valleys. At Funtley on the east side of the valley, the valley side completely disappears and it is linked with the valley of the River Wallington.

The lower stage of the valley is from south of Titchfield to the sea. The actual valley just south of Titchfield is almost one mile wide and only the 25ft contour separates the valley from that of the other neighbouring rivers. The actual valley disappears as it merges in with the coastal plain at Titchfield Haven.

Geology of the Meon Valley.



The Chalk consists of upper, middle, and lower chalk.

The Eocene beds consist of the Reading beds which are of mottled clay with sand and of Local clay.

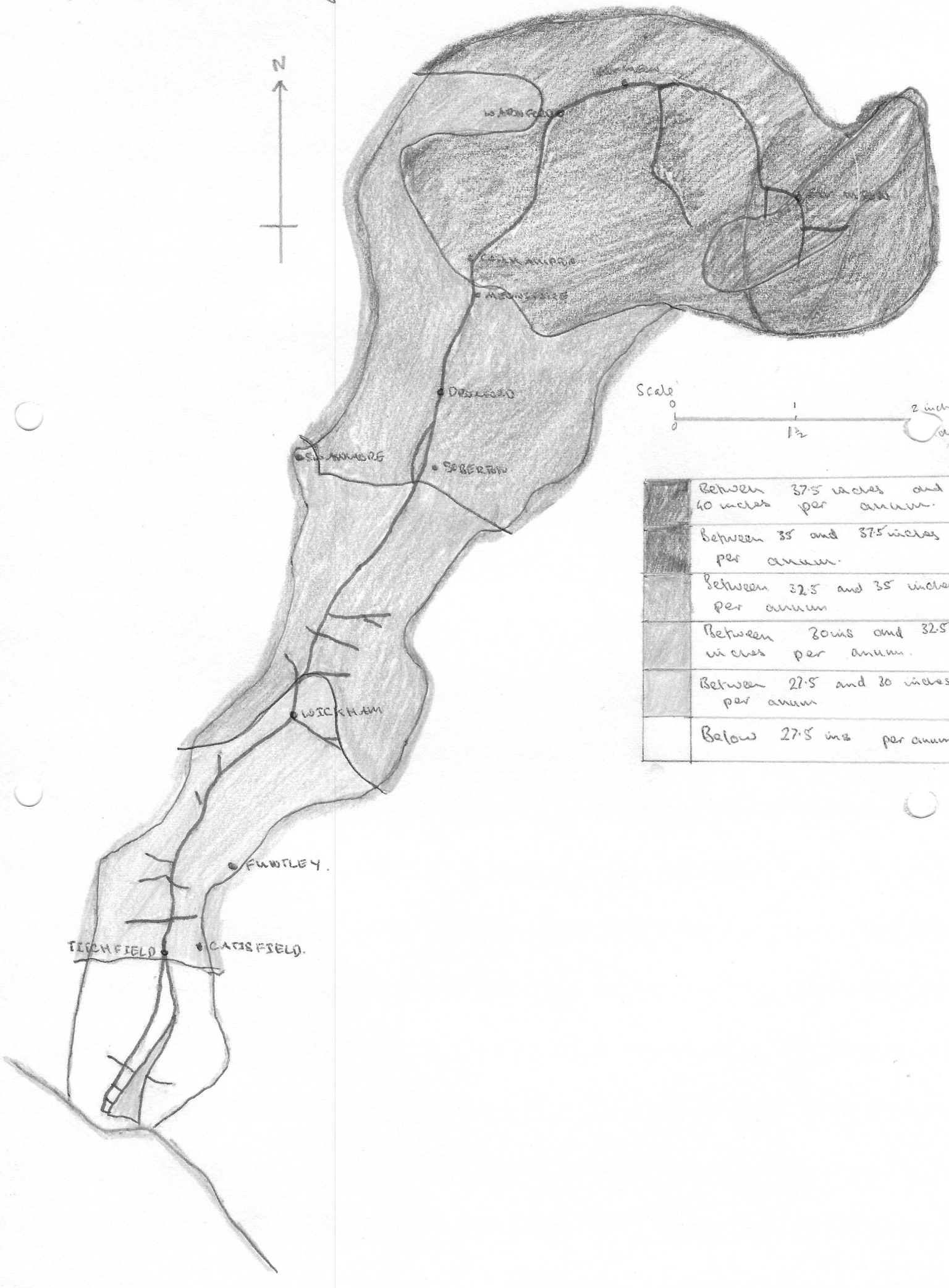
THE GEOLOGY OF THE MEON VALLEY

The geology of the Meon Valley can be divided up into chalk and the Eocene Beds. The chalk ends about half way down the river between Soberton and Wickham. There is a small bed of red-mottled clay above West Meon but apart from this the valley is chalk for the first half. The chalk can be divided into three types. Firstly there is the upper chalk which is soft white chalk with many flints. Then there is the middle chalk which is hard white chalk with a few flints. Lastly there is the grey marbly chalk which is called the lower chalk. A band of chalk travels along the south coast in the Eocene Beds and it just reaches the Meon Valley at Funtley. It is a band of upper chalk.

The Eocene Beds are made up of the Reading Beds and local clays. The Reading Beds are made up of mottled clay with sand.

The actual bed of the River Meon is of Alluvium which is made by deposits from the river. At times river and valley gravel is built up.

Rainfall of the Meon Valley



THE RAINFALL OF THE MEON VALLEY

The amount of rain that falls each year in the Meon Valley increases the further one goes up the river. For instance at the mouth there is about 25ins per annum; half way up it is between 30ins and 32.5ins per annum; at the source the rainfall is the greatest - between 37.5ins and 40ins per annum.

These figures came from the Southern Water Authority's periodical which is published every seven years. It was last published in 1969 and so these readings are not quite correct for the 1975-76 winter when there was a below average rainfall.

METHOD OF SURVEY

The survey on the River Meon was carried out in early November (Points One to Nine) and late December (Points Ten to Twenty-four). From ordnance survey maps, scale 1:25,000, convenient or otherwise interesting points were chosen to measure the river. At eighteen out of the twenty-four points chosen measurements were carried out. The width, depth every foot and at most places the speeds were measured. The type of material on the river bed and the shape of the valley was also noted. A photograph was taken at most points.

At six of the points no measurements were taken. These points were where the river did something that affected it or where man had changed it. These points were the source; the village of East Meon where man had built up the banks; a field after East Meon where the water flow was controlled; the splitting of the river into a canal and river; the end of the canal; and the source and haven together as one point.

After the field work had been completed I visited Southampton University but I found very little material concerning the River Meon. No student had done a study on the river nor had the Civil Engineering Department to which I was referred. In the geography library I took notes on the geology of the area and looked at some water board reports. I was advised to obtain a periodical of the Southern Water Authority but when I enquired I was told that there were none available.

KEY TO THE SURVEY POINTS

The Map of the Area surrounding the River

Scale :- 3:25,000, (unless otherwise stated)

The small green arrow represents the direction of the photograph.

The green box contains the distance from the source and the distance to the mouth.

The reference is taken from the Ordnance Survey maps, scale 1:25,000.

The Cross Section of the River

Vertical Scale - 1cm: 2ins

Horizontal Scale - 1cm : 2ft.

The depth was taken every foot across.

The Speed of the River

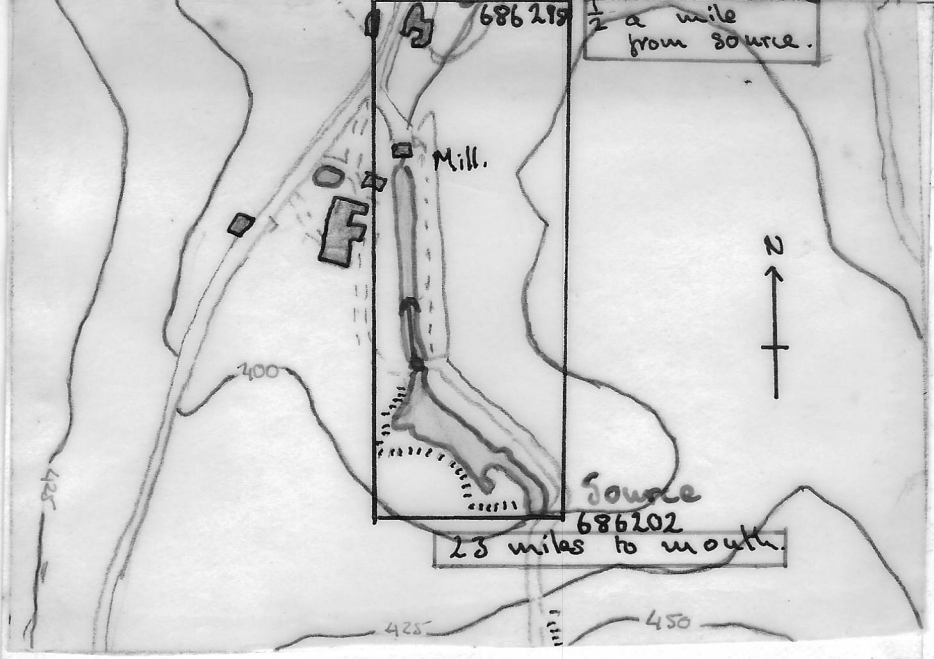
This is represented by the yellow arrow which is to scale.

1cm represents 1in/sec.

The Long Profile

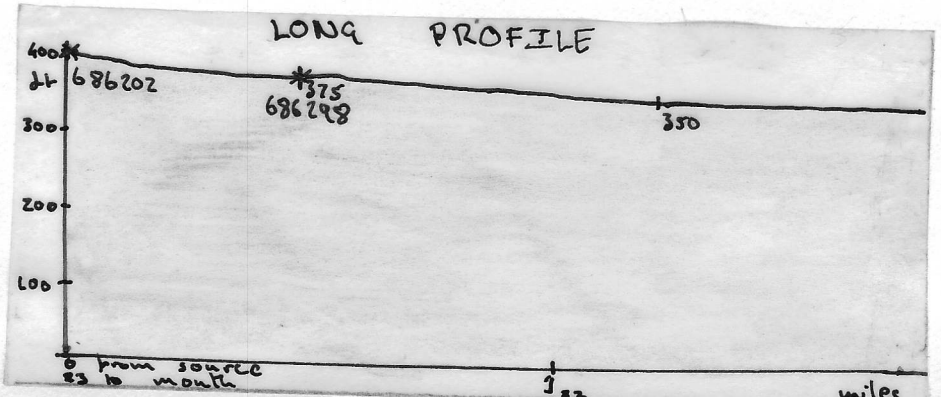
Horizontal scale - 2½ins : 1 mile

Vertical scale - 1cm : 100 ft.



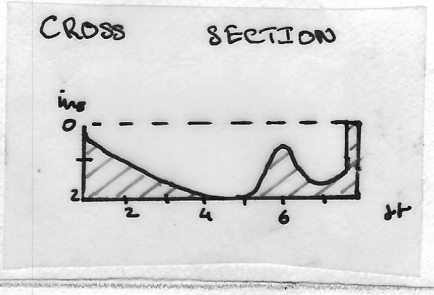
Point One - The Source

The source was dried up and it is normally only wet in very wet weather. The water board takes out water for HMS Mercury which is about 2 miles away. The source becomes very marshy as it progresses and eventually a pond is formed. Out of the pond there flows a small nearly stagnant stream which was too small to measure. The valley is a wide valley at this point.

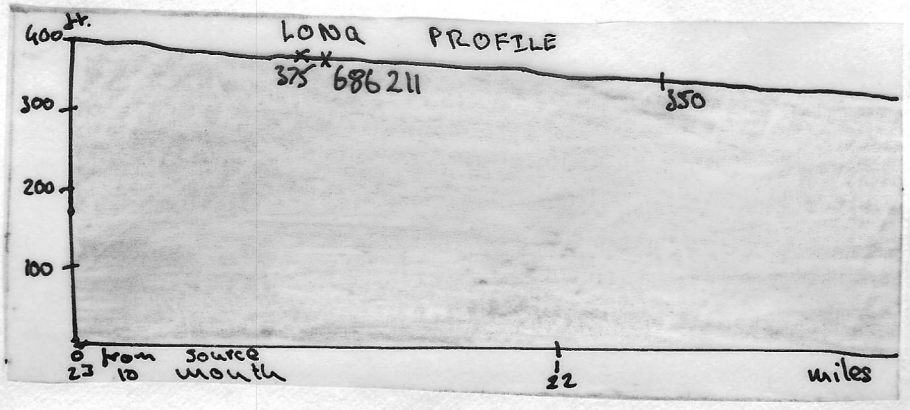


Point Two.

WIDTH - 7 ft



The bottom of the river is made up of flint and silt. It is meandering in the wide valley. There are too many obstacles at this point for a speed test.

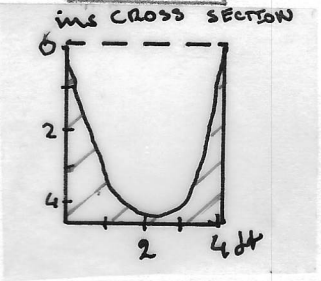


Point Three

BEFORE TRIBUTARY

WIDTH - 4 ft.

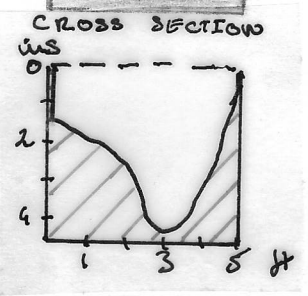
ins CROSS SECTION



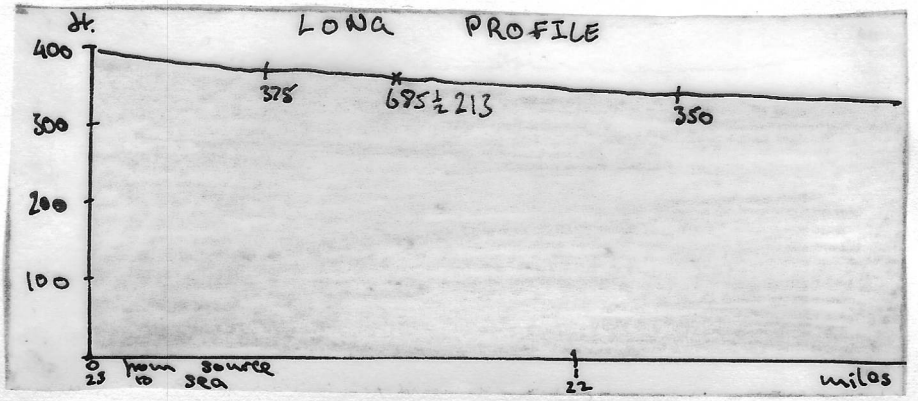
AFTER TRIBUTARY.

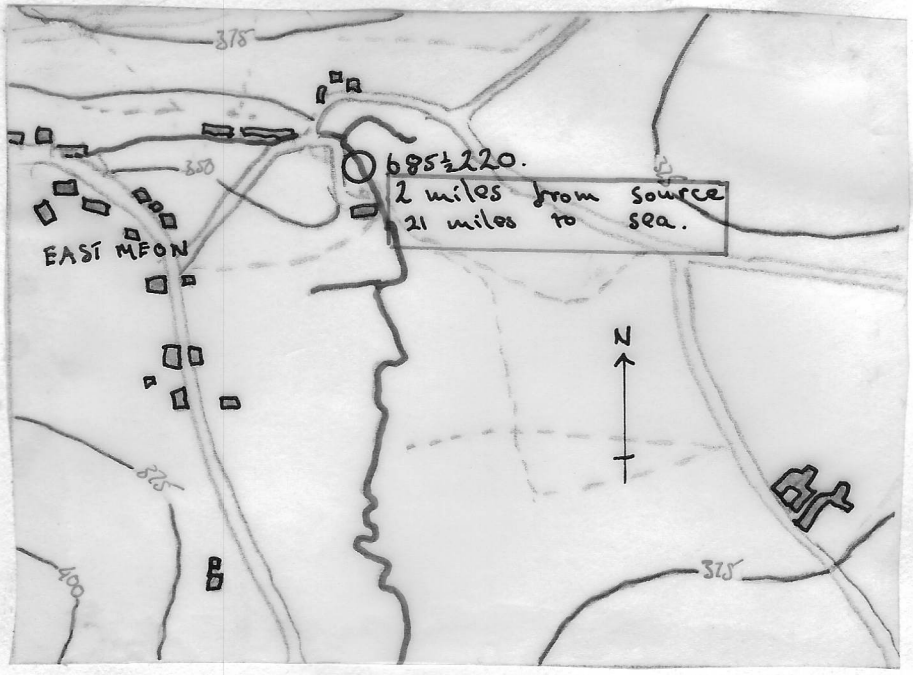
WIDTH - 5 ft.

CROSS SECTION

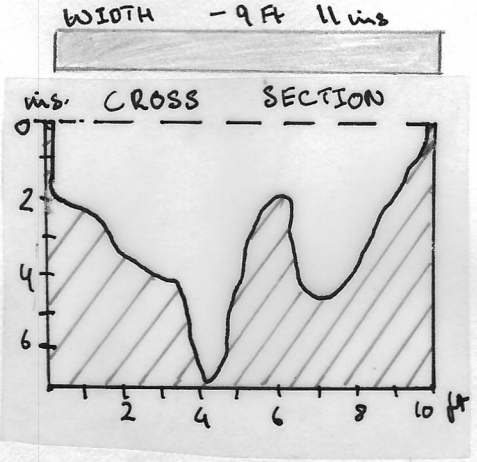


This is the first main tributary to enter the river. It comes from a pond about half a mile away. There were too many obstacles for a speed test. The bottom is of silt and rubble and the valley is still wide.

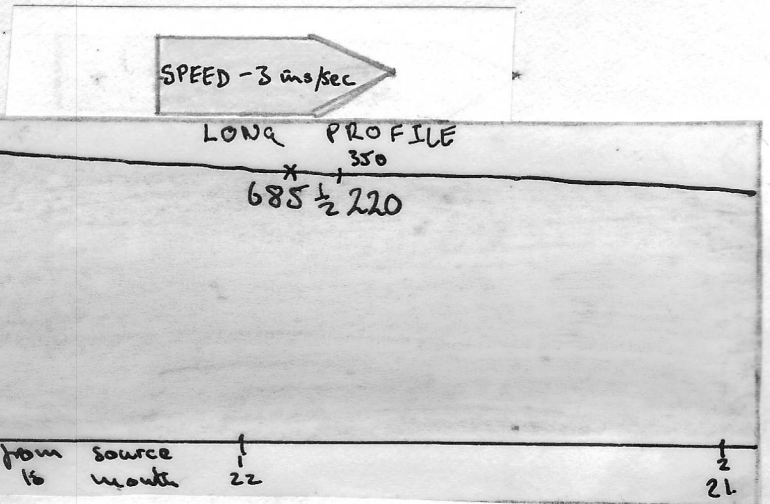


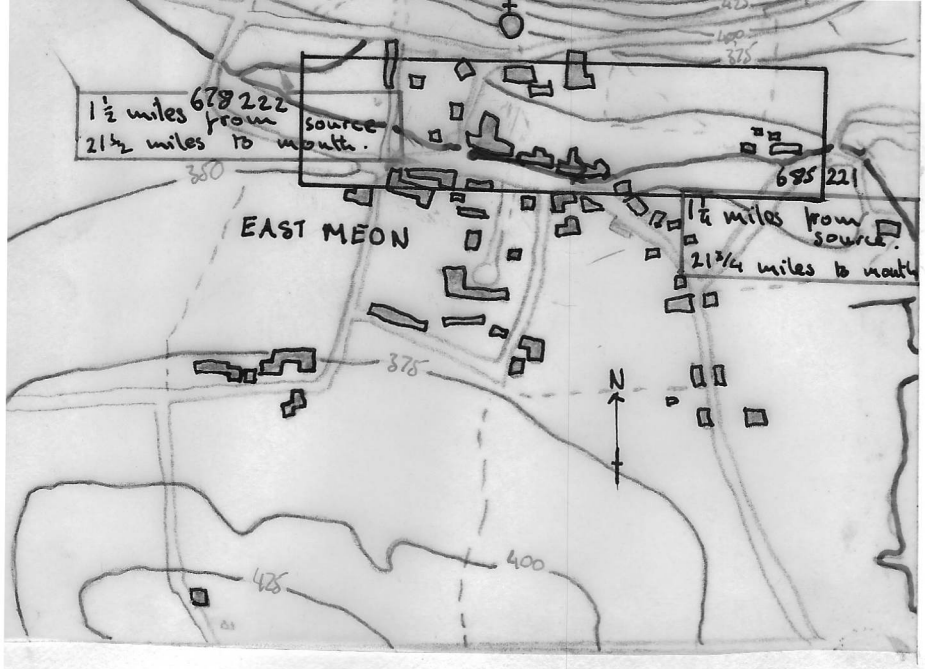


Point Four.



The river now has been increased by drainage from the valley and small tributaries. The bottom is of silt with rubble from the village and flints.

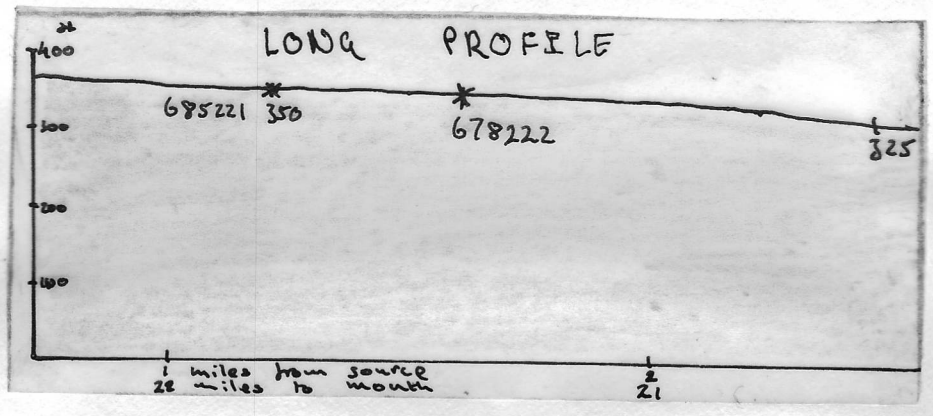


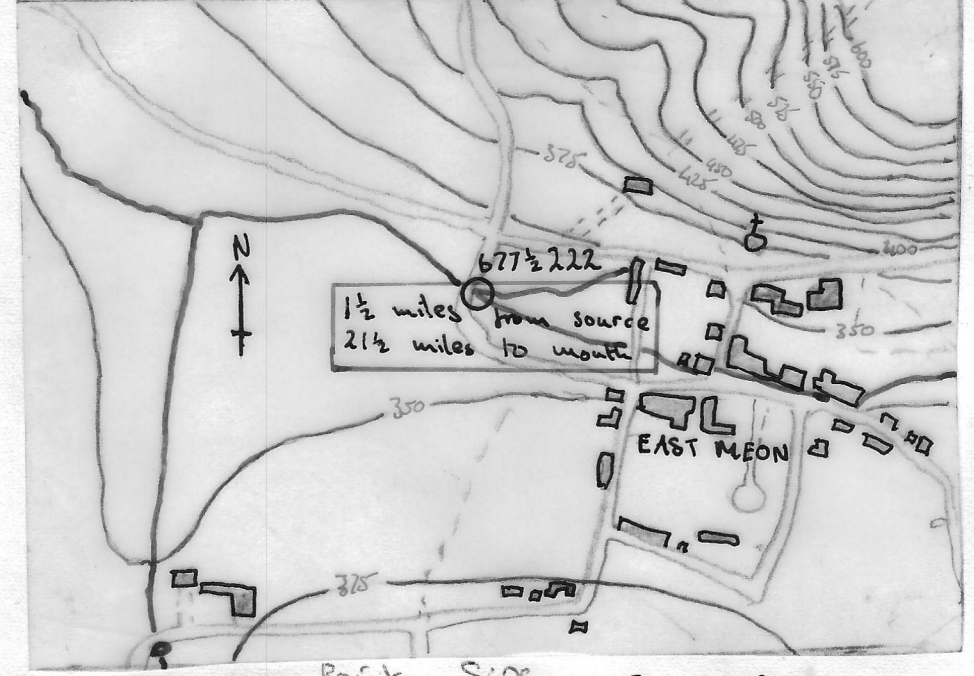


Point Five

In the village of East Meon the river has had walls built along side it to stop it flooding as it used to flood down the main street. The bottom is part of a perched water table as the chalk has become highly saturated.

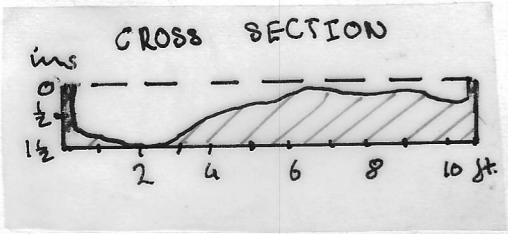
Perched water-table





BEFORE TRIBUTARY

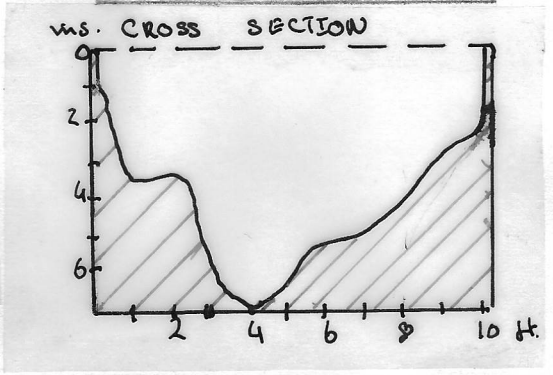
WIDTH - 10ft 8ins



Pocut Side.

AFTER TRIBUTARY.

WIDTH - 10 ft. 4 ins.



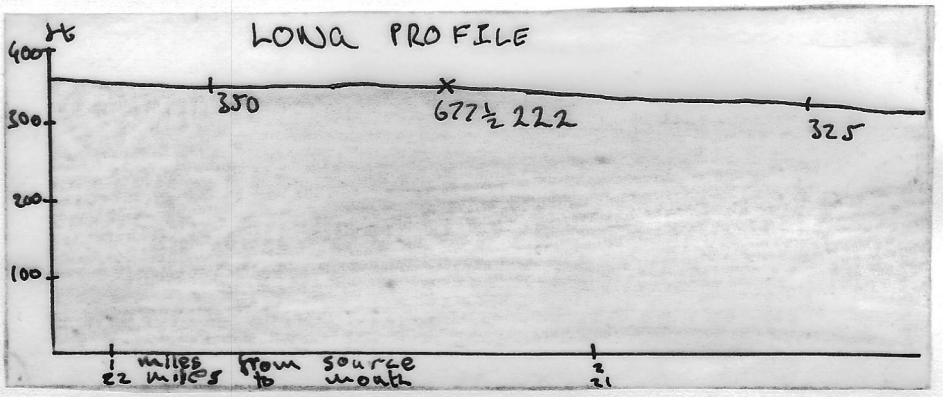
The tributary flows from the hill to the north. The river has increased its volume since it has been through the village. The bottom is of loose pebbles and silt.

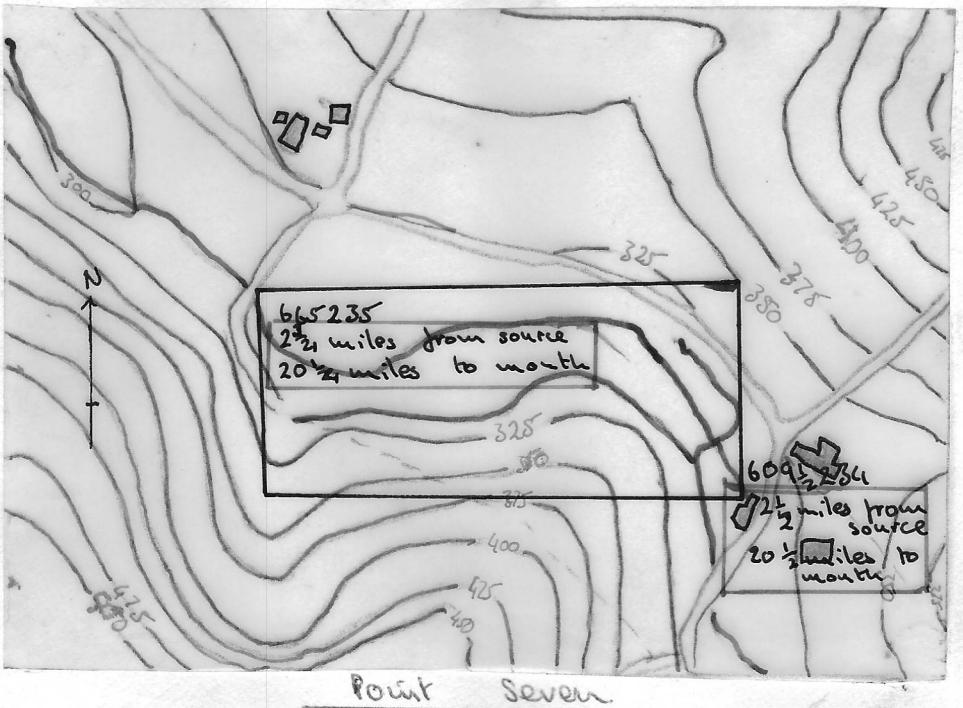
SPEED - 8.8 ins/sec.

BEFORE TRIBUTARY

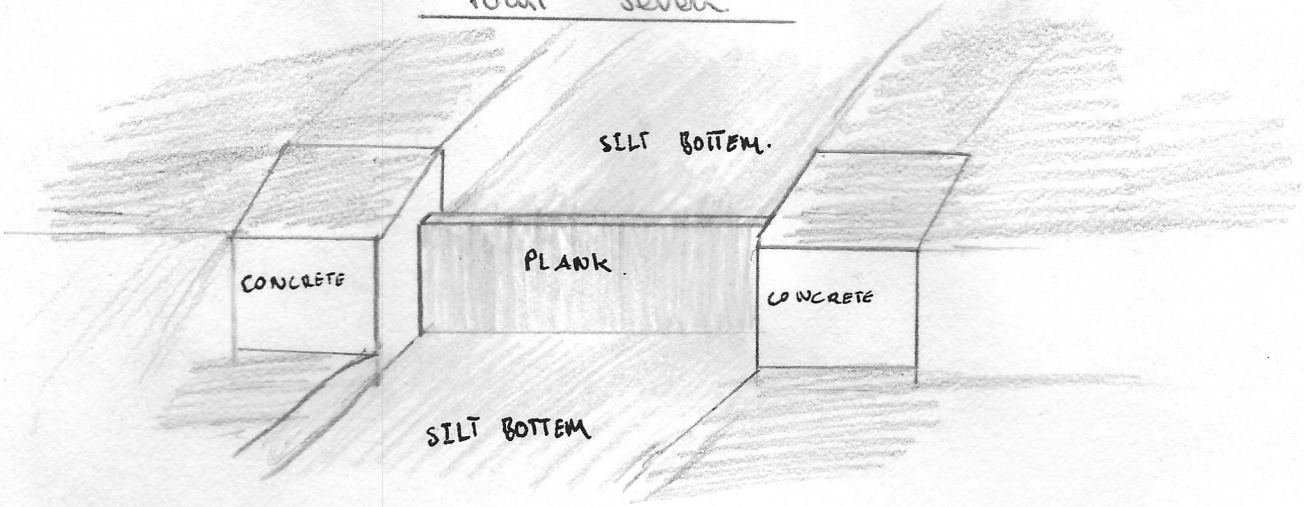
SPEED - 3.8 ins/sec

AFTER TRIBUTARY.

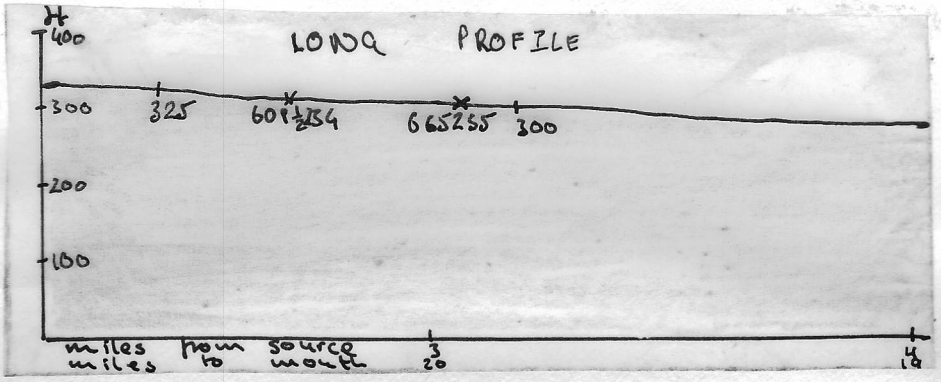


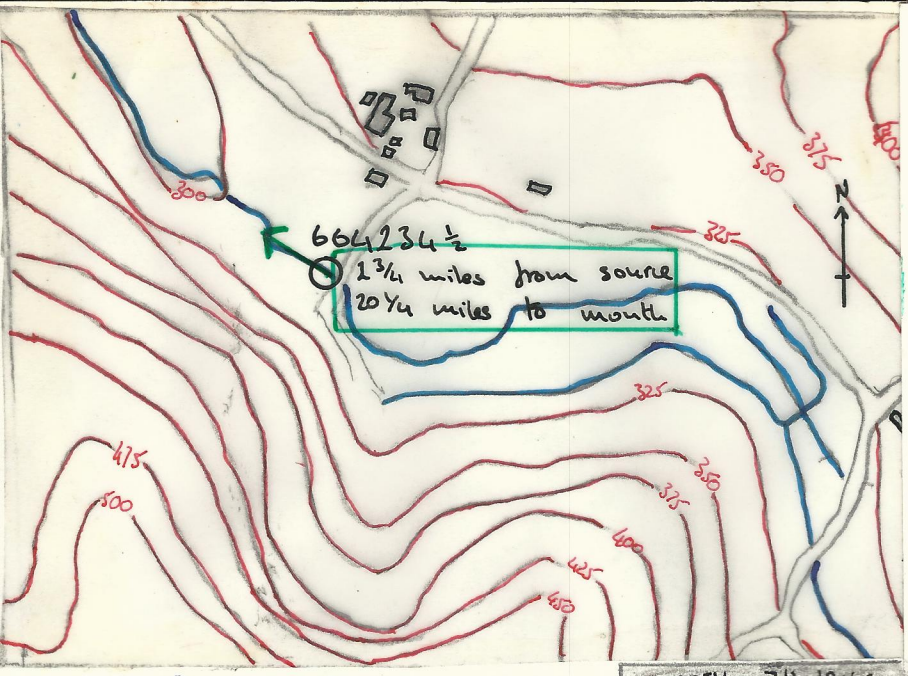


Point Seven

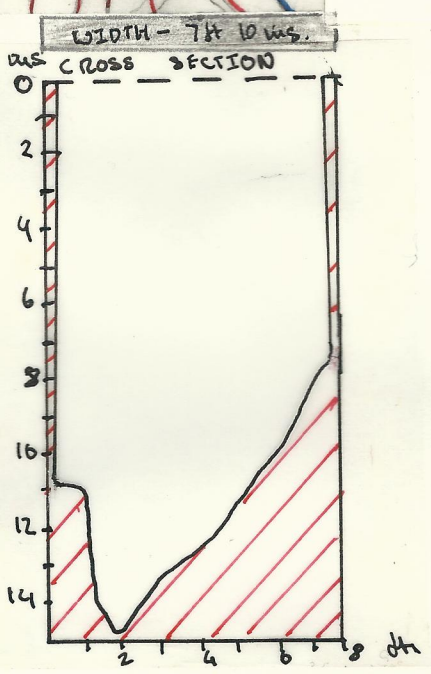


Between these two points the river has been artificially slowed down. Mini-dams have been built all along and because of this weed has grown thickly and it has silted up. The river is about 10 feet wide and a foot deep.

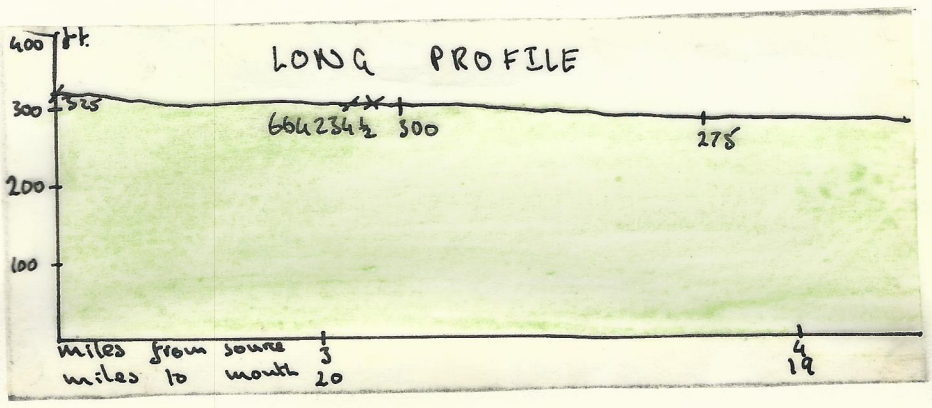


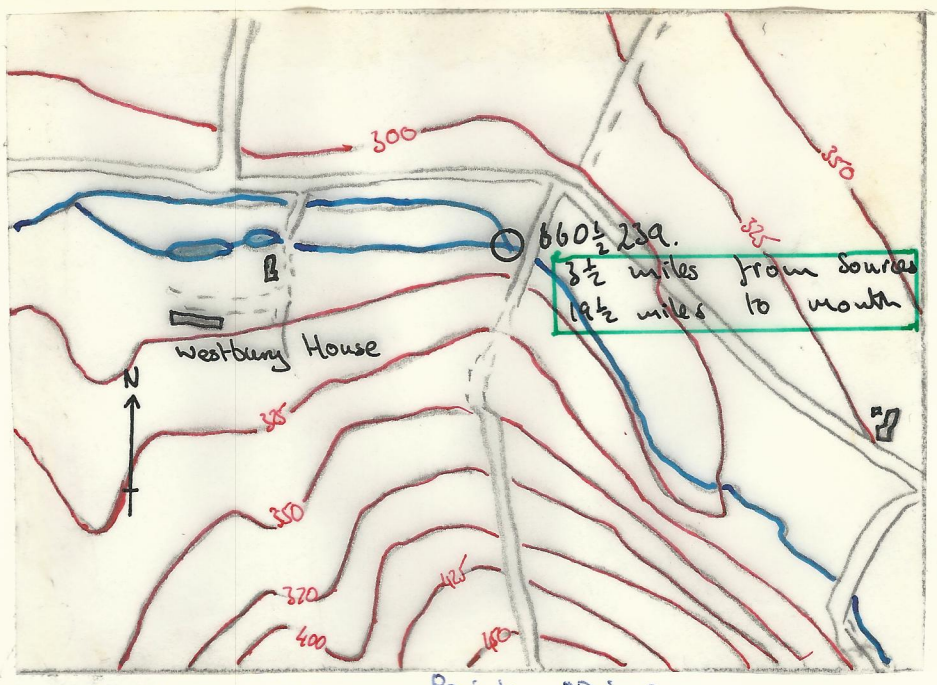


Point Eight.



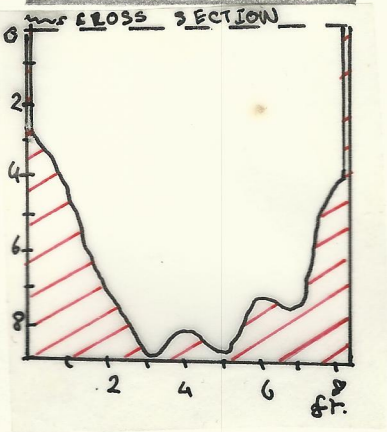
The river's volume has been greatly increased because of the drainage from the surrounding land. The bottom is of silt with small bits of rubble and flints. There are too many obstacles and the rate is too slow for a speed test.





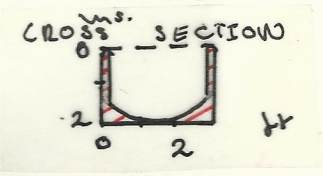
BERORE RIVER SPLITS. Point One

WIDTH – 8ft 2ins

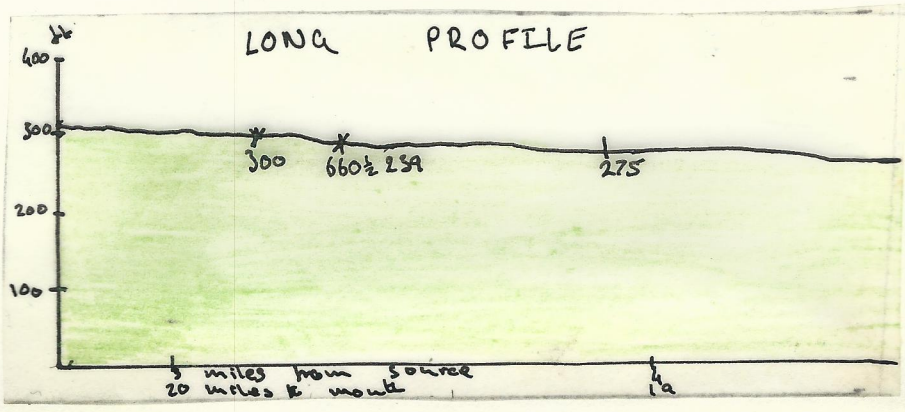


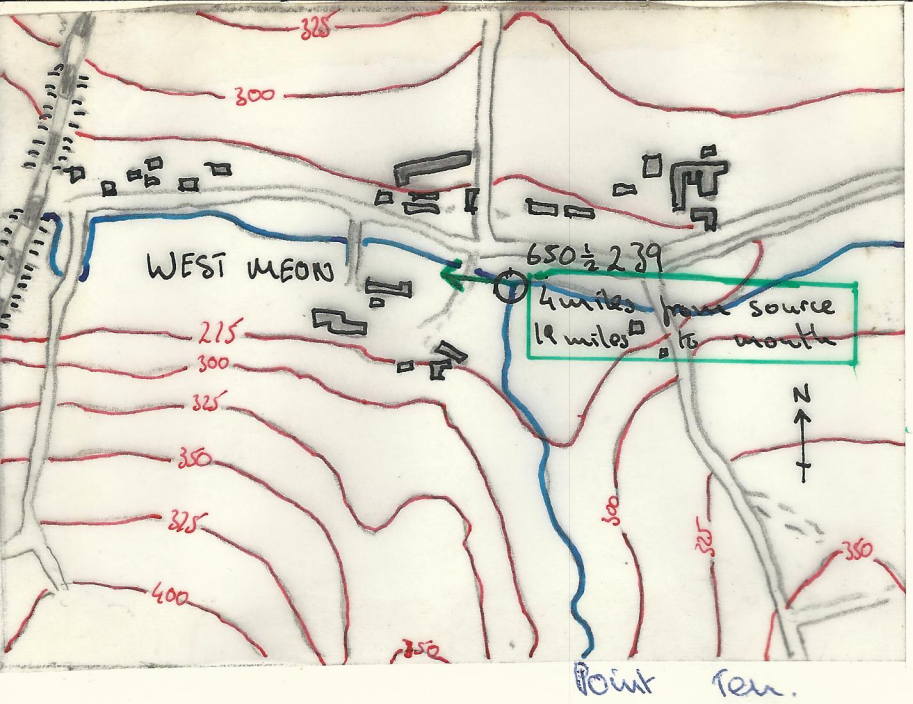
NORTHEN HALF OF SPLIT.

WIDTH 3ft 4ins.



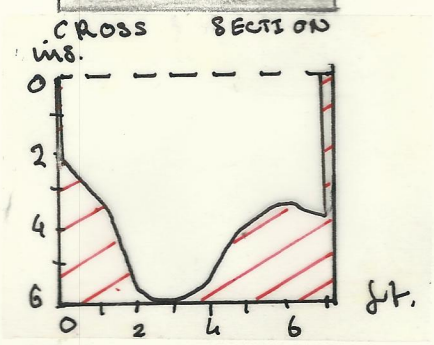
Here the river splits itself. On the map it is shown to split into two parts but in fact the southern half was dried up. The river diminishes rapidly at this point because it flows into a pool which only lets a little water out. Both times it was too slow for a speed test. The bottoms are of silt and flints. The river then flows into a pond in Westbury House and very little flows out.





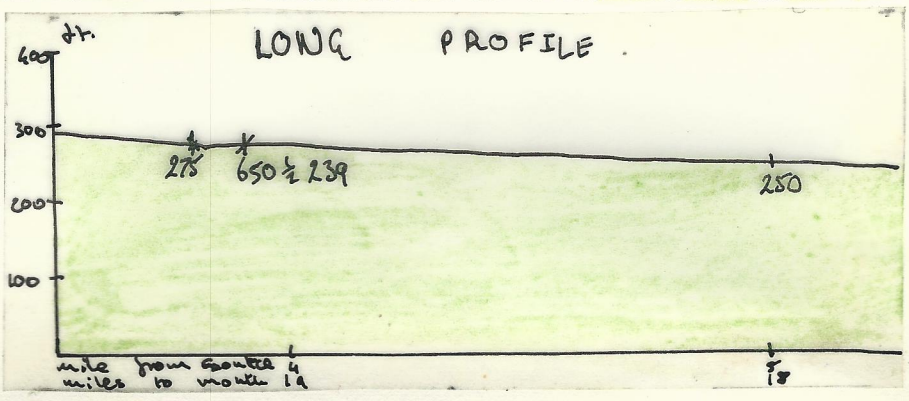
Point Ten.

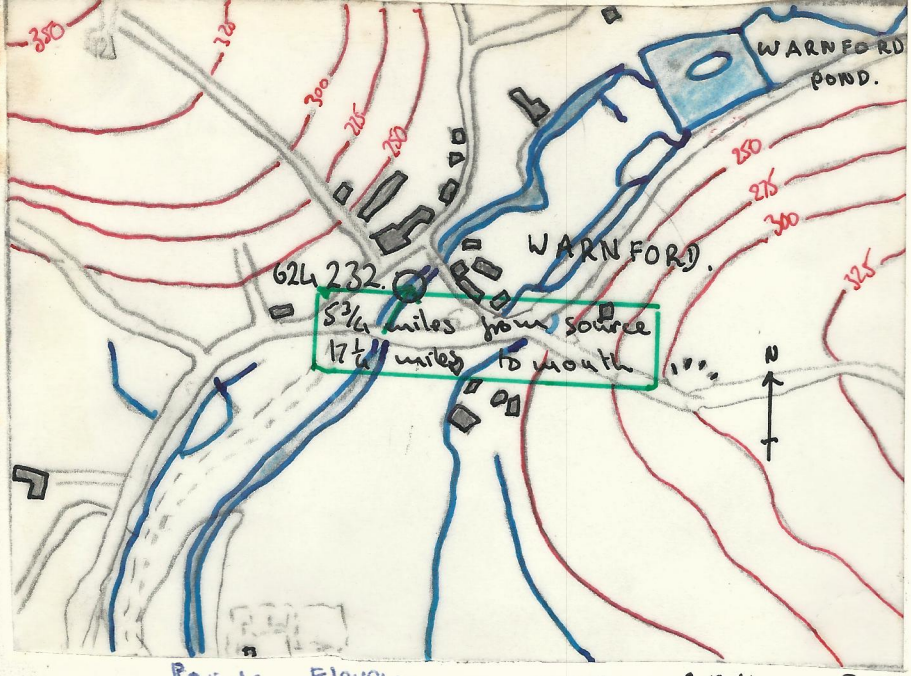
WIDTH - 7ft 6 ins.



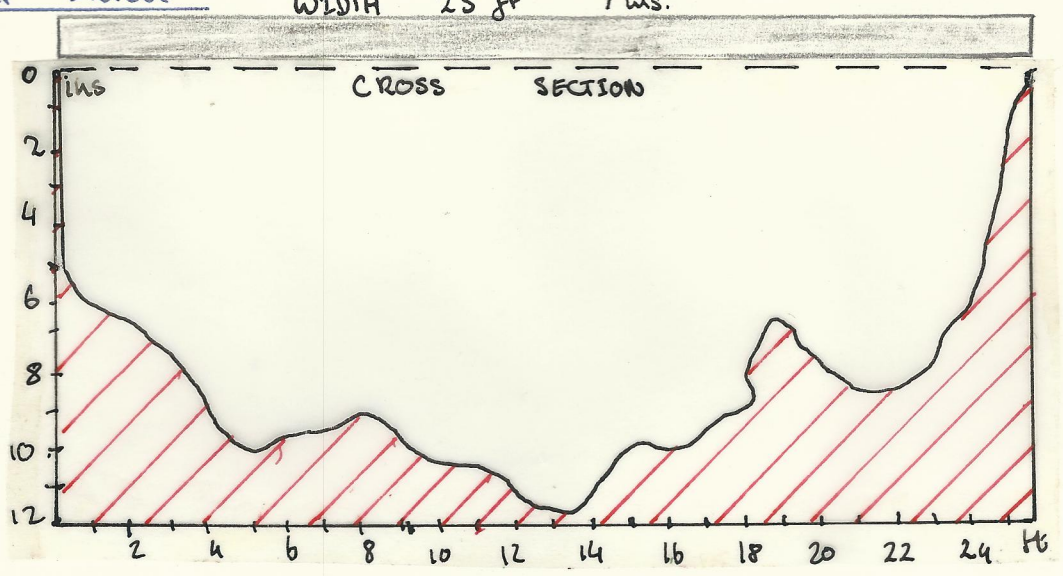
The tributary did not hold much water at the time of the survey. It came from two springs nearly two miles away. It is still in a wide valley and it has a silt bottom.

SPEED - 13·3 ins /sec



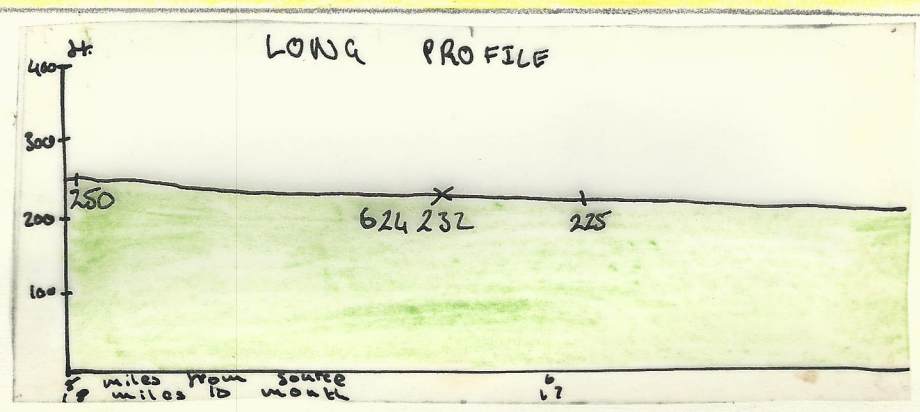


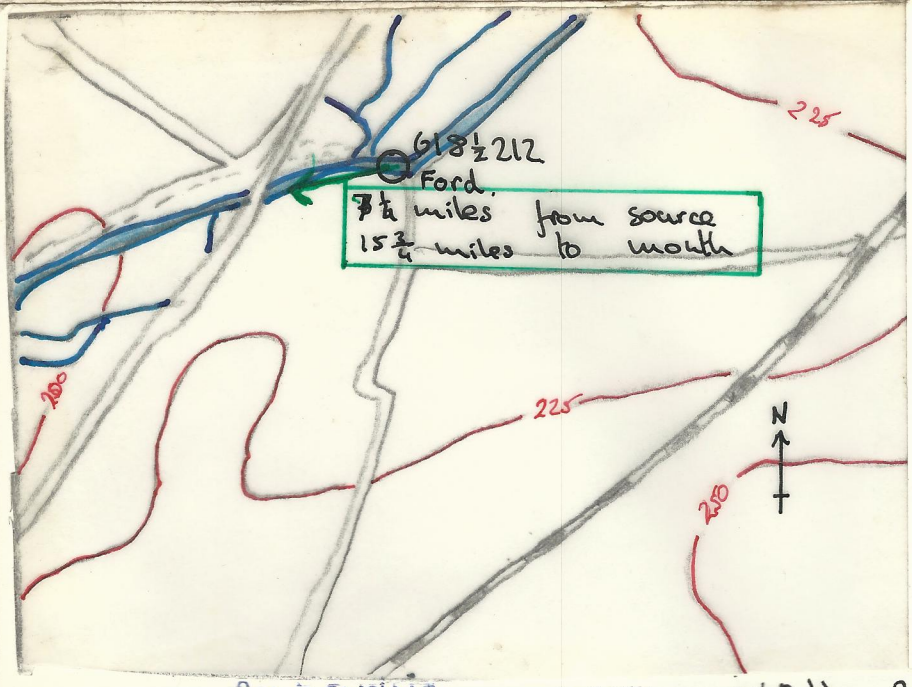
Point Eleven. WIDTH 25 ft 7 ins.



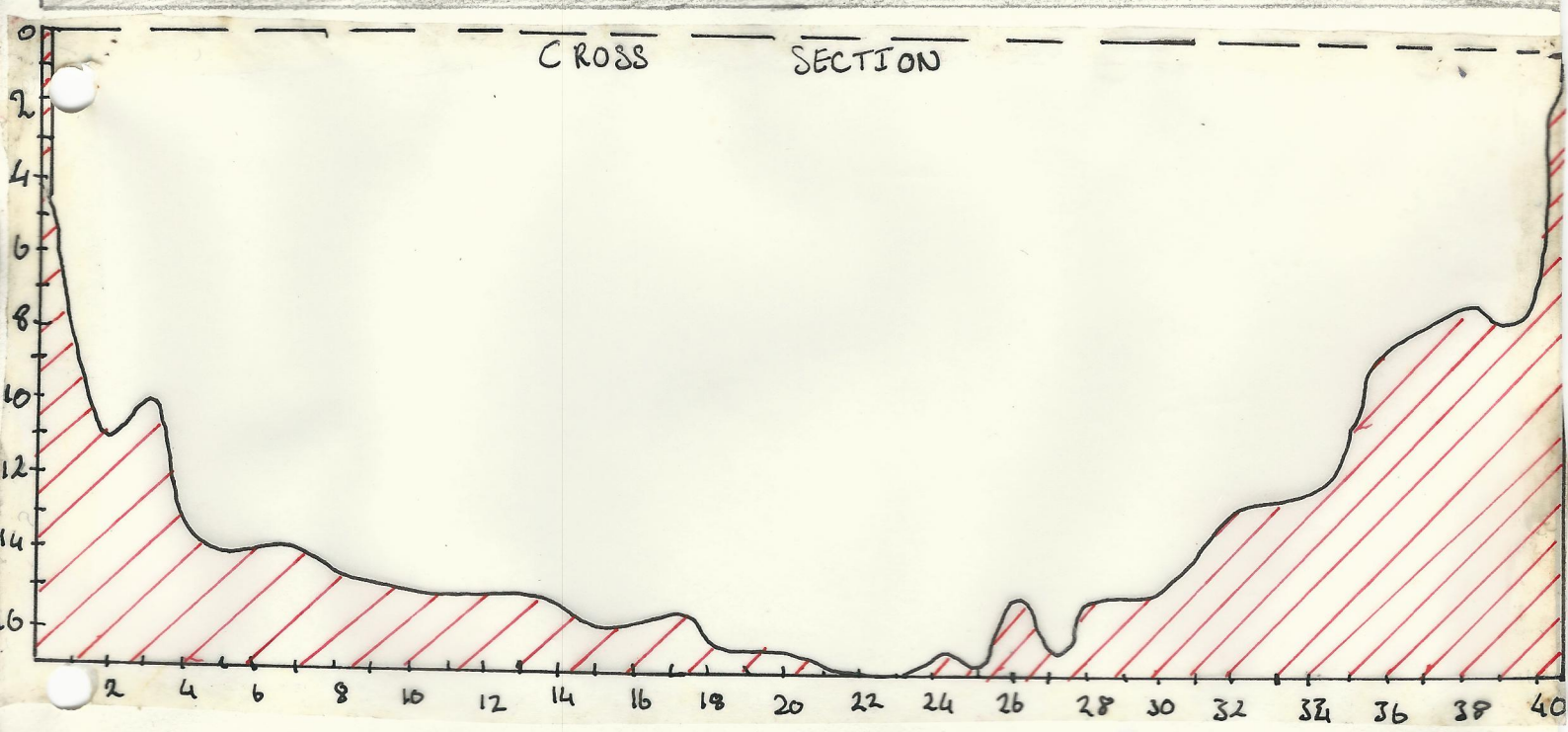
The river now has increased in volume because several tributaries have flown into the river from the land drainage system. The bottom is of flints and silt.

SPEED 20 ins /sec

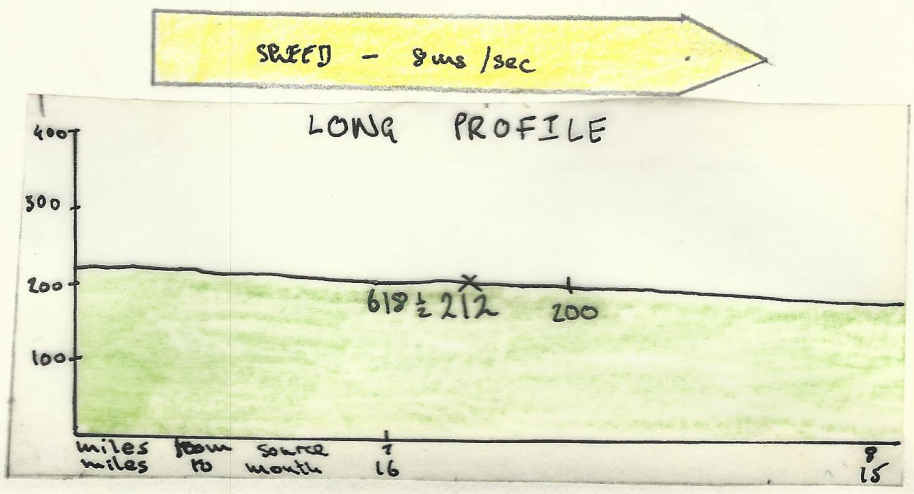


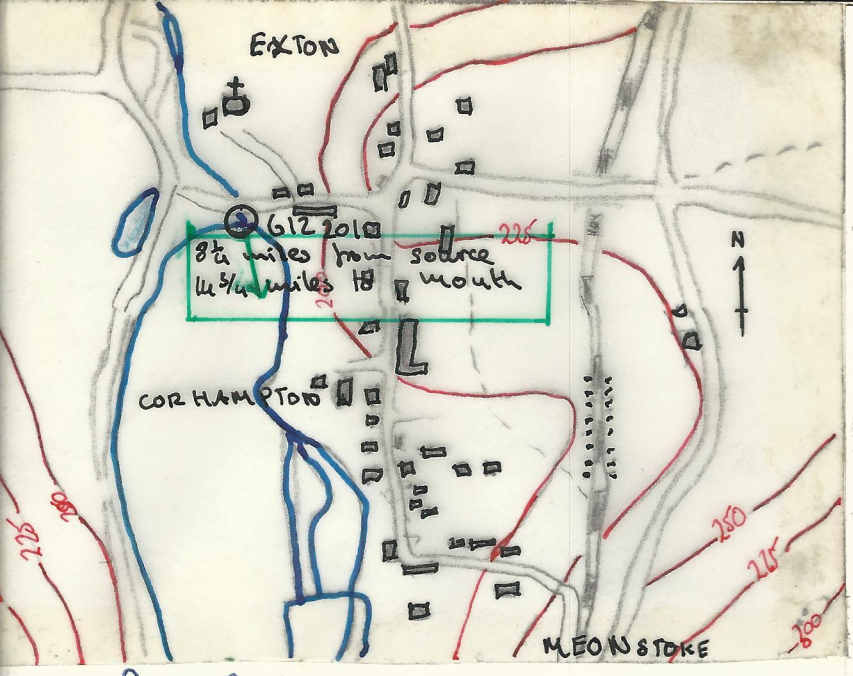


Point Twelve WIDTH - 40 ft 9 ins.

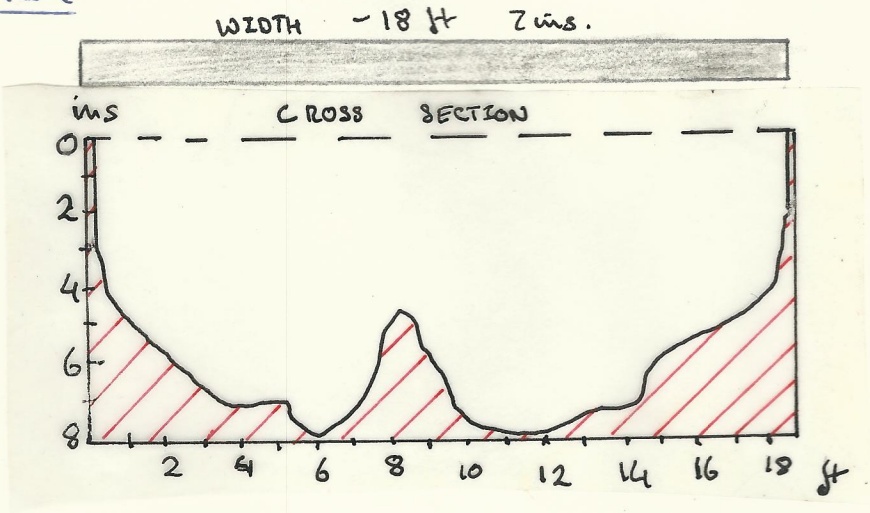


This is the widest the river ever reaches. it is in a wide valley and is being continually increased by land drainage. The bottom is of hard chalk and silt with flint and rubble.



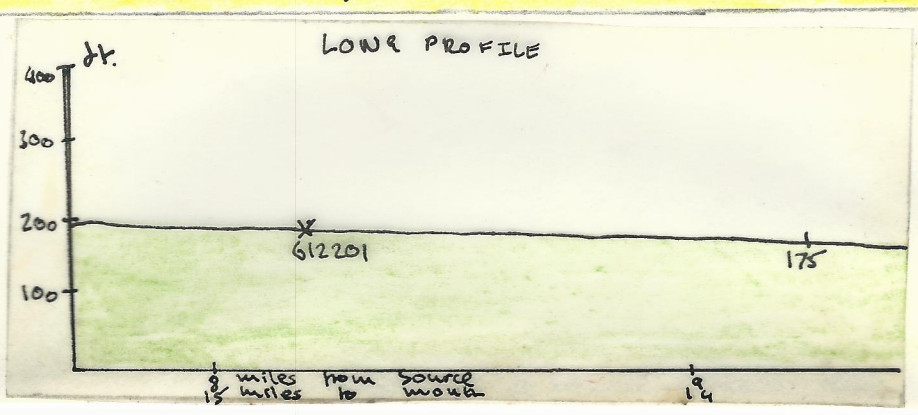


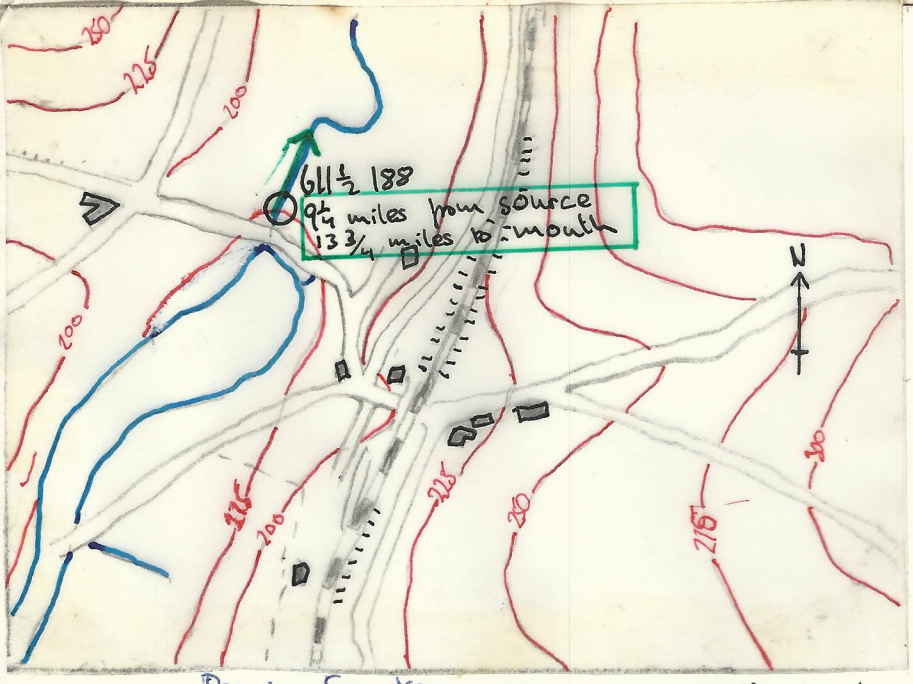
Point Thirteen.



The surrounding land is extremely marshy and it is fairly flat. The river splits quite often and then comes together again. Channels have been dug to help with the drainage. This is the fastest the river ever flows.

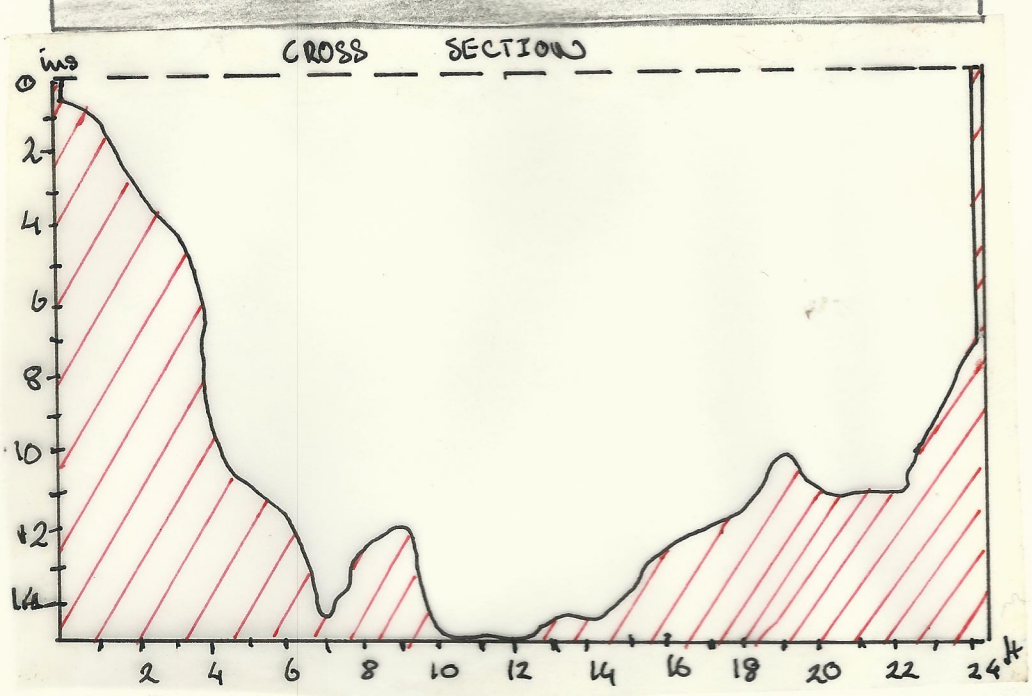
SPEED - 40 ins/sec



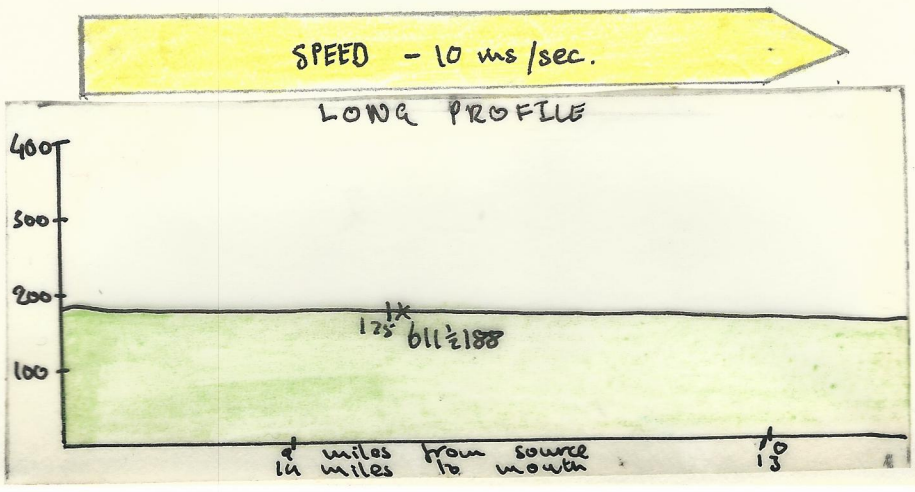


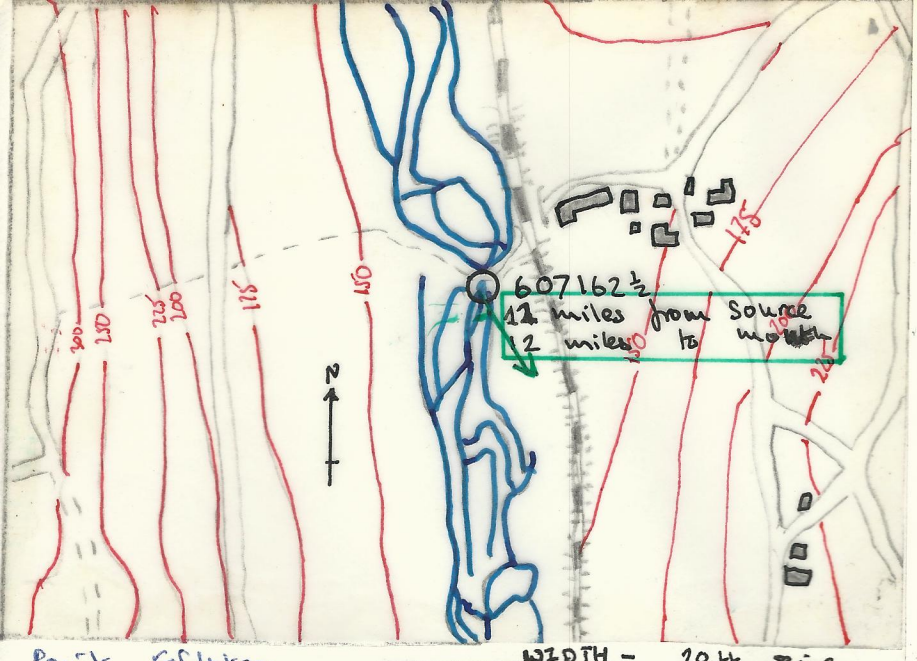
Point Fourteen.

WIDTH – 24ft 4ins

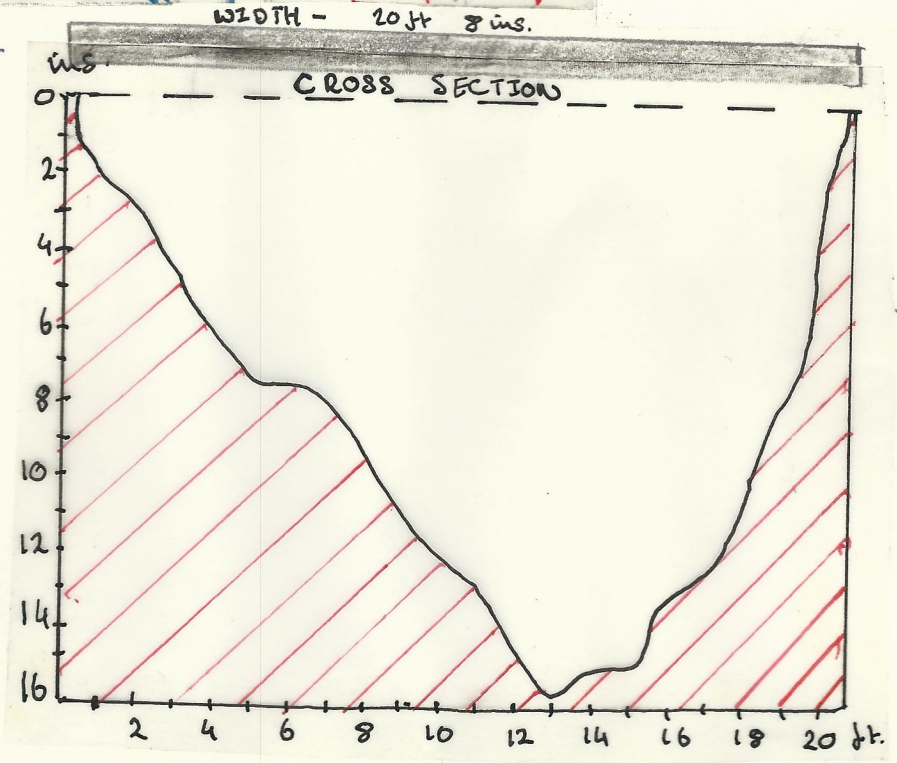


The river here is continuously splitting and rejoining again. The ground is very marshy and there is a lot of drainage off the land into the river.



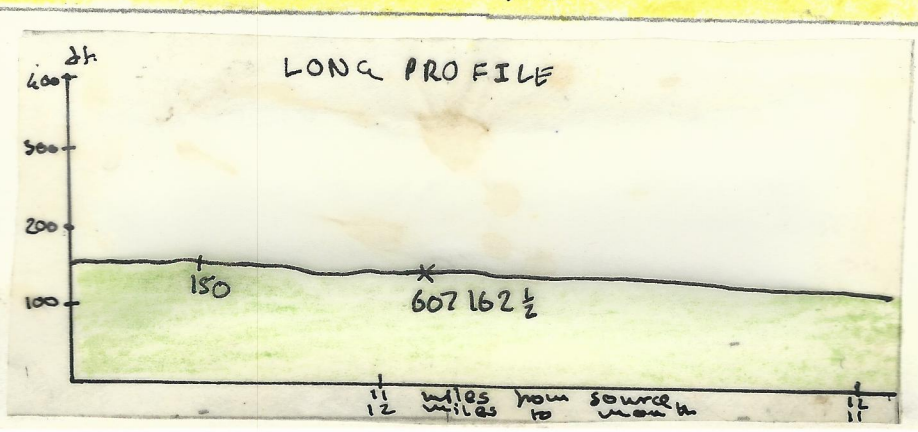


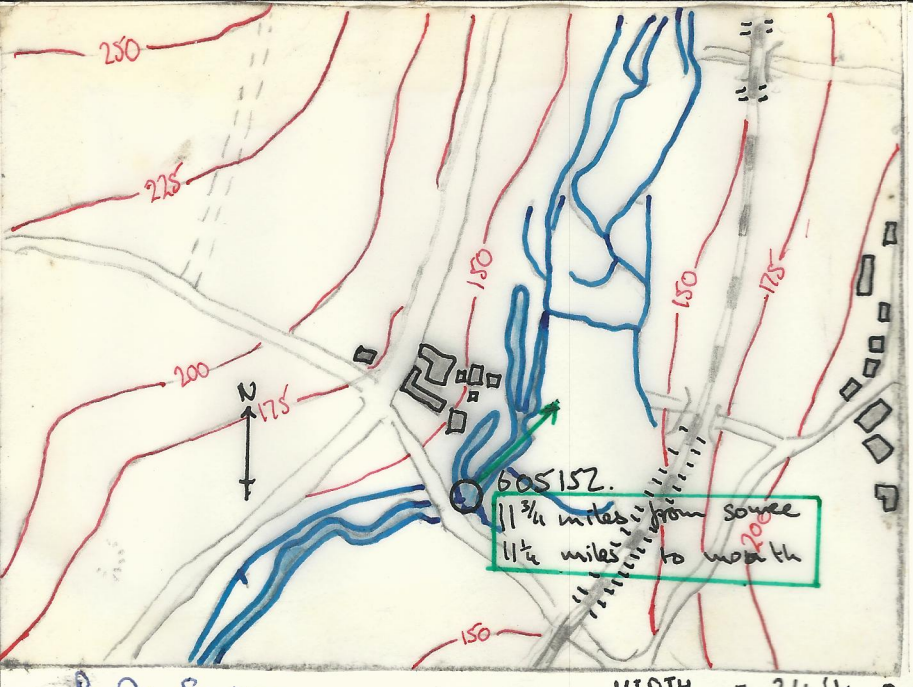
Point Fifteen.



The river is meandering down the wide valley and it continues to split and rejoin. The bottom is of flint and silt

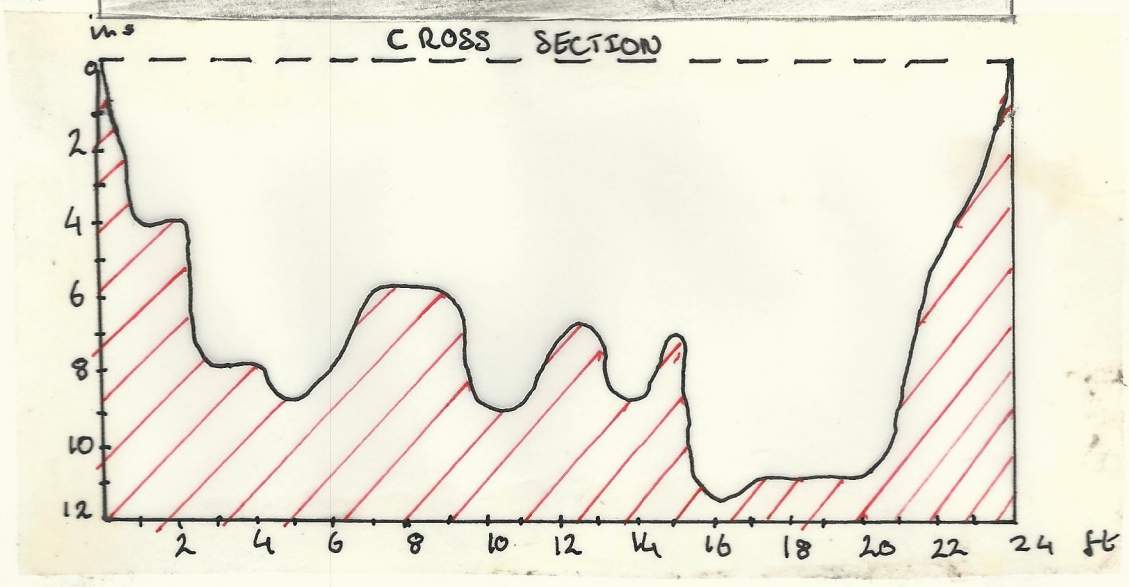
SPEED - 20 ins/sec





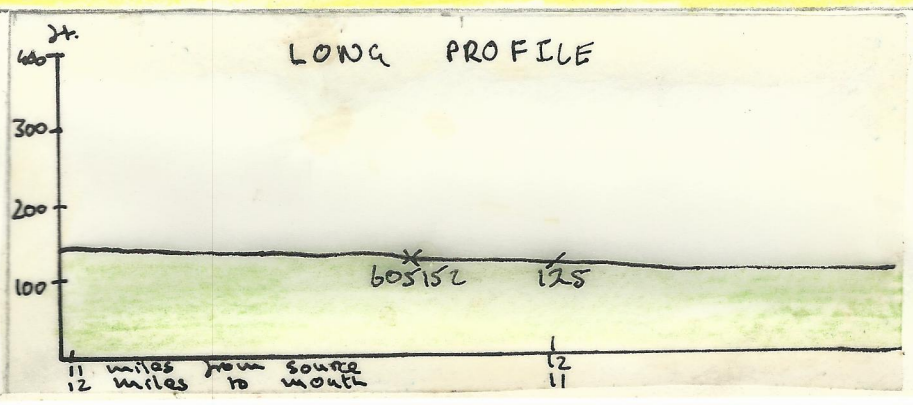
Part Sixteen.

WIDTH - 24 ft 0 ins



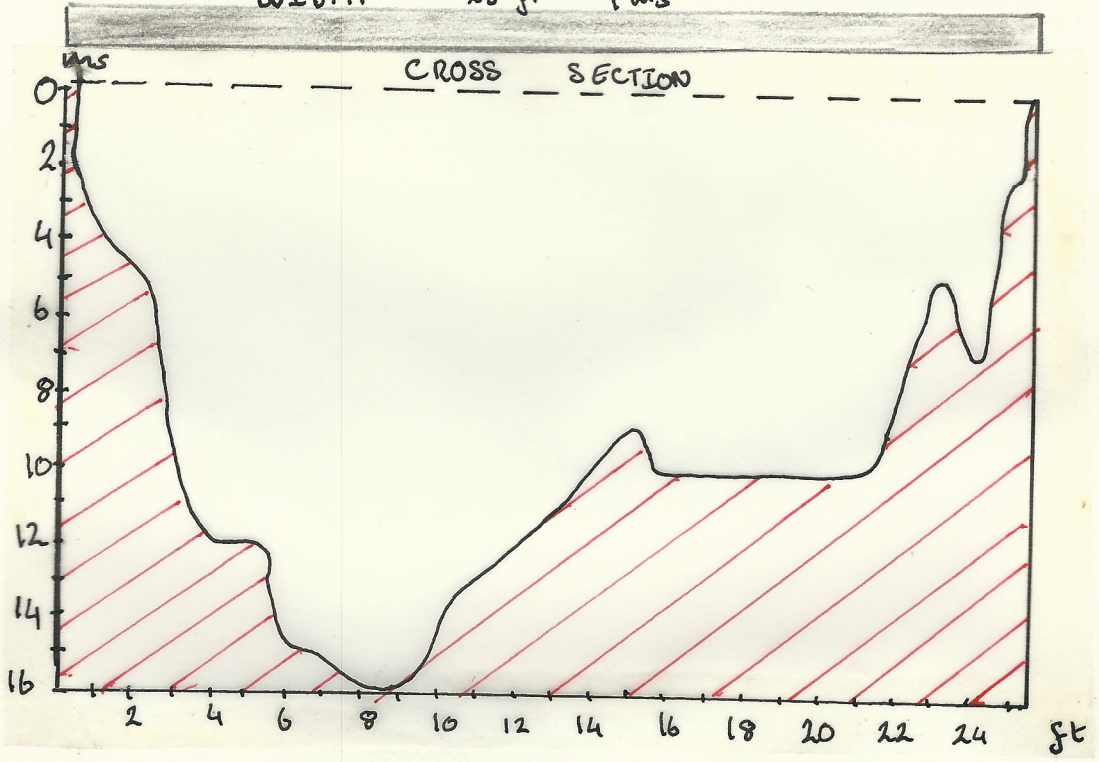
The river here has increased in volume because of the land drainage. It is still split and rejoining. The bottom is of silt and pebbles.

SPEED - 17·1 ins/sec



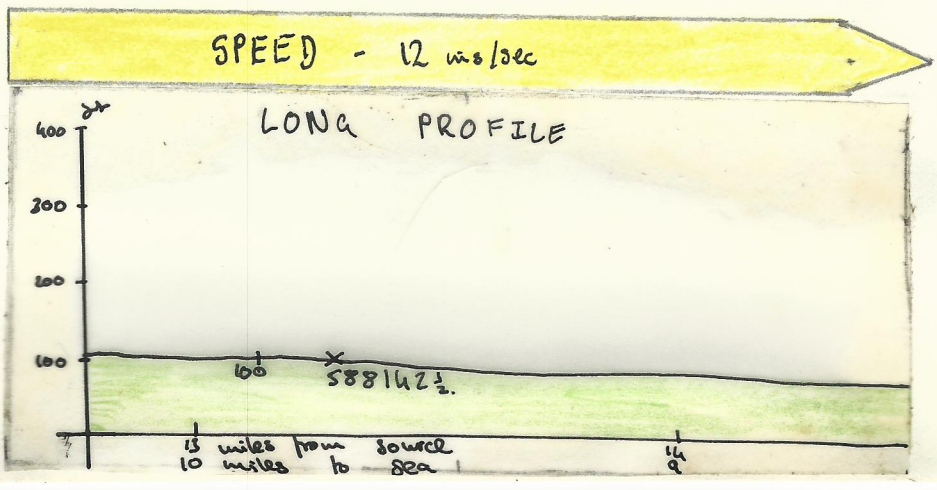
Point Seventeen.

WIDTH ~ 25 ft 9 ins

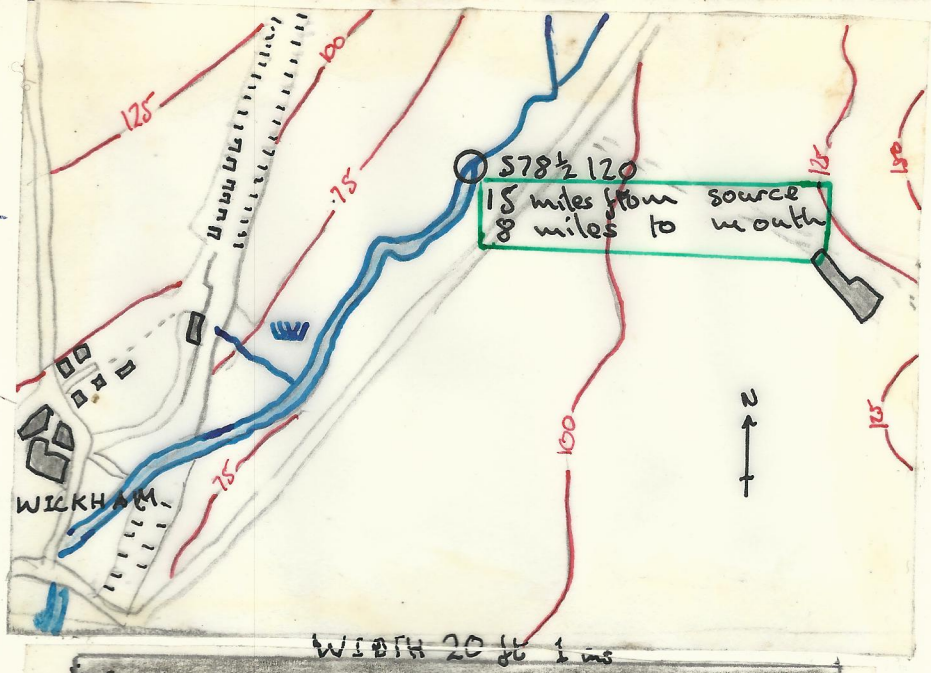


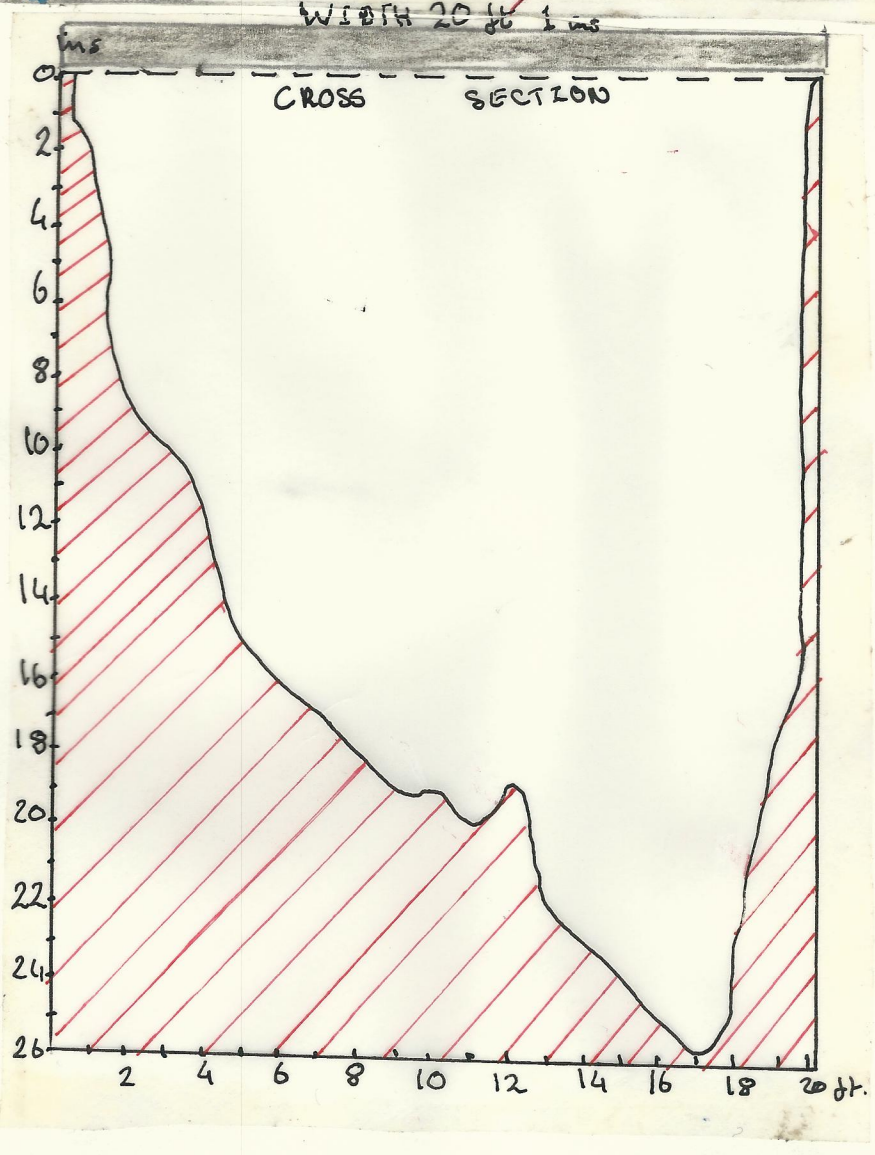
The bottom here is of silt and pebbles. The river is still in a wide valley and the ground now is not so marshy.

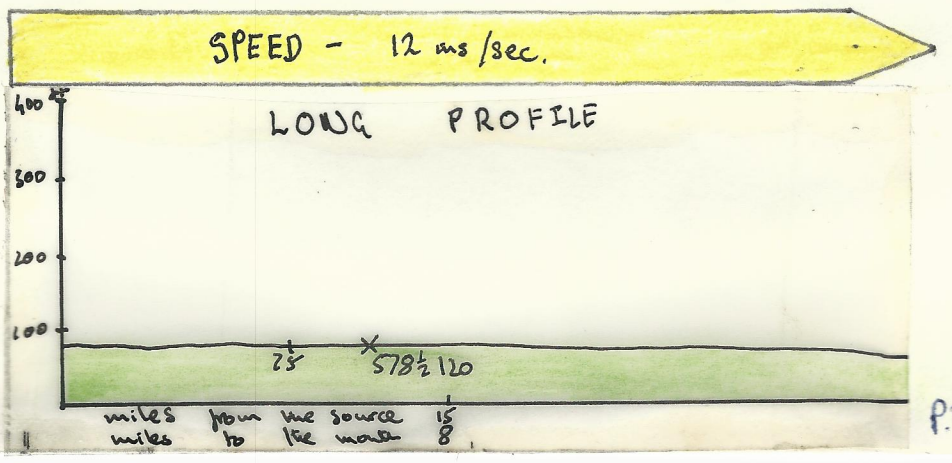
SPEED - 12 ins/sec



Point Eighteen





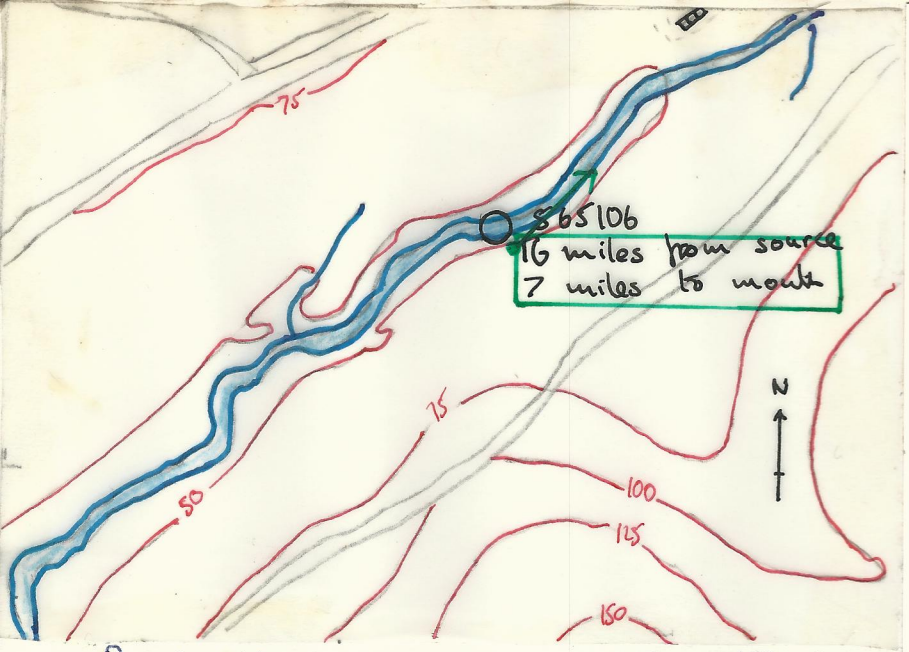


P.T.O to continue.

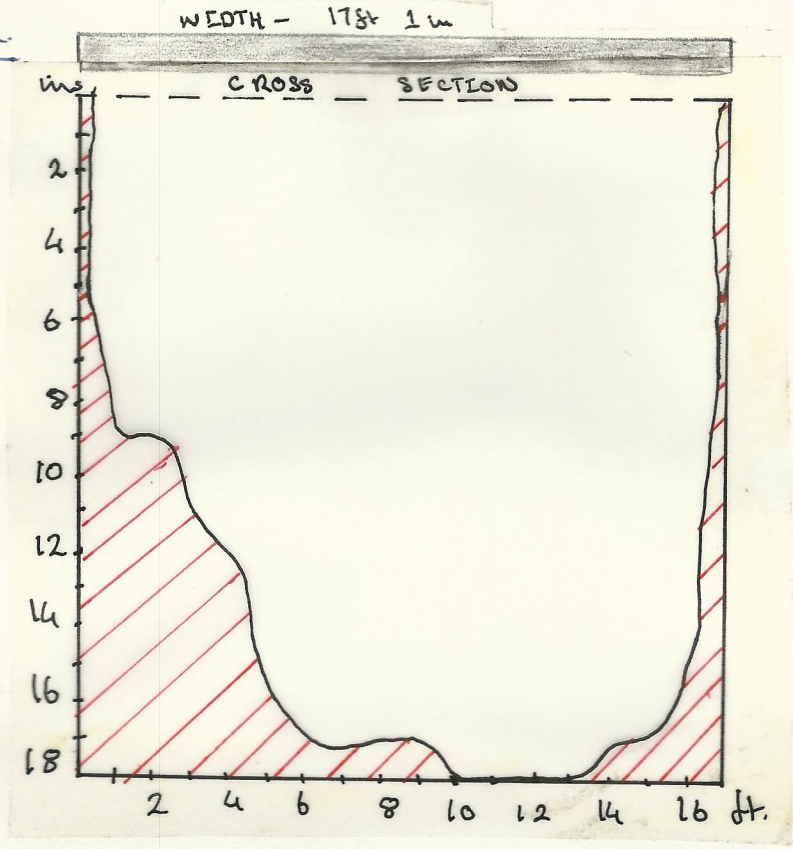
Point Eighteen continued.

The river has now changed into being a deep slow running river. It is still fairly wide. Previously higher up it has changed from being fast and shallow to slow and deep and then back to shallow and fast. The bottom is of sediment and leaves from the wood and is very silty.

The bank of the river has been built up to stop the river from flooding.

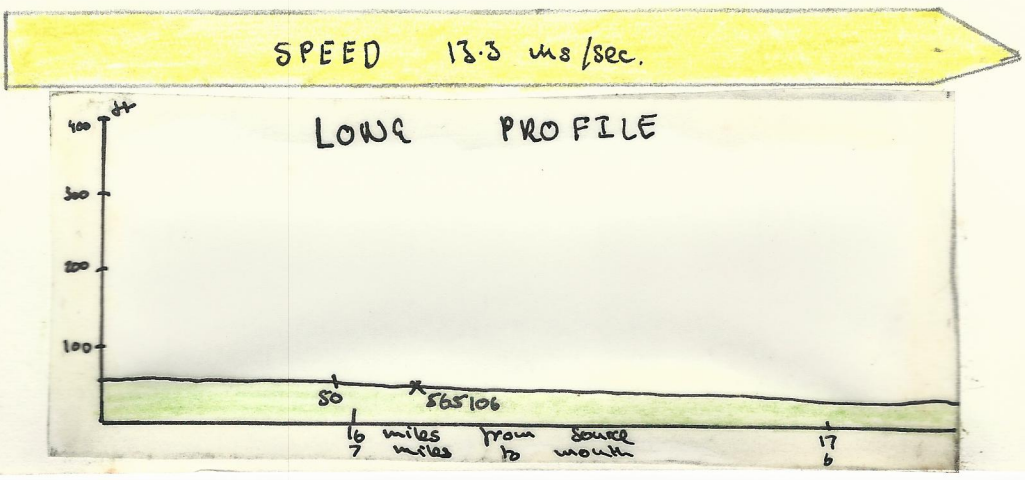


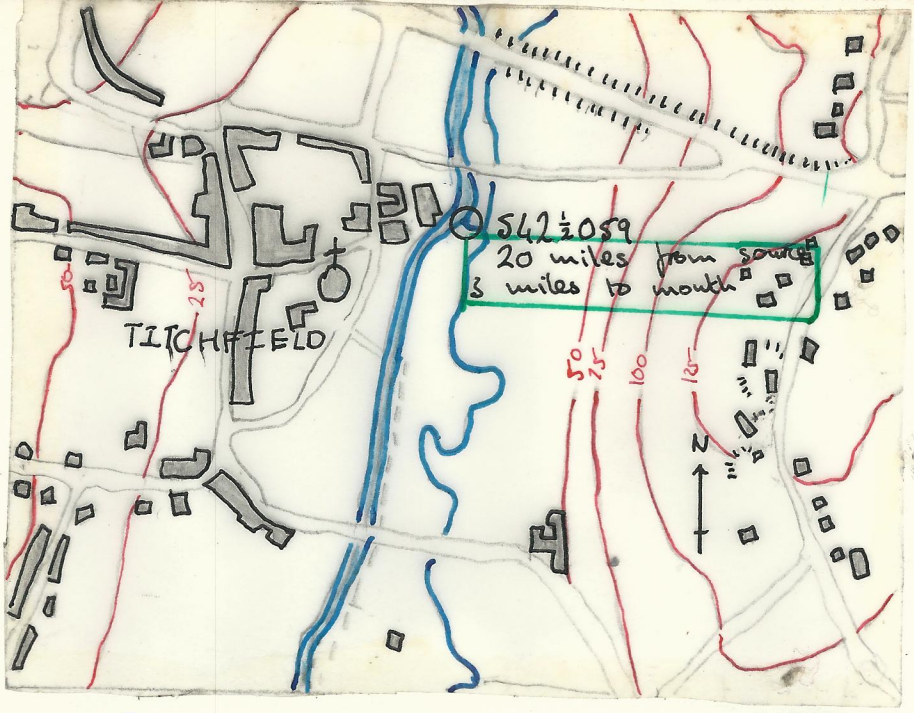
Point Number



The river at this point is comparatively shallow and fairly fast flowing. It is affected by fallen debris and also some sewage works (off the map).

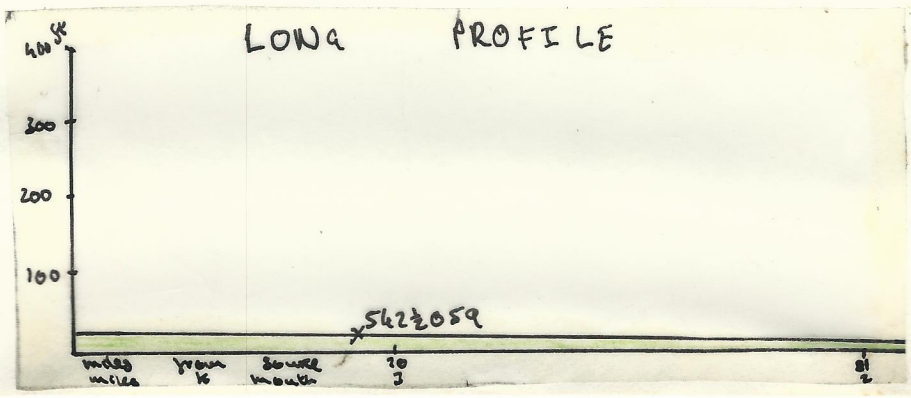
The bottom is of pebbles and flint.

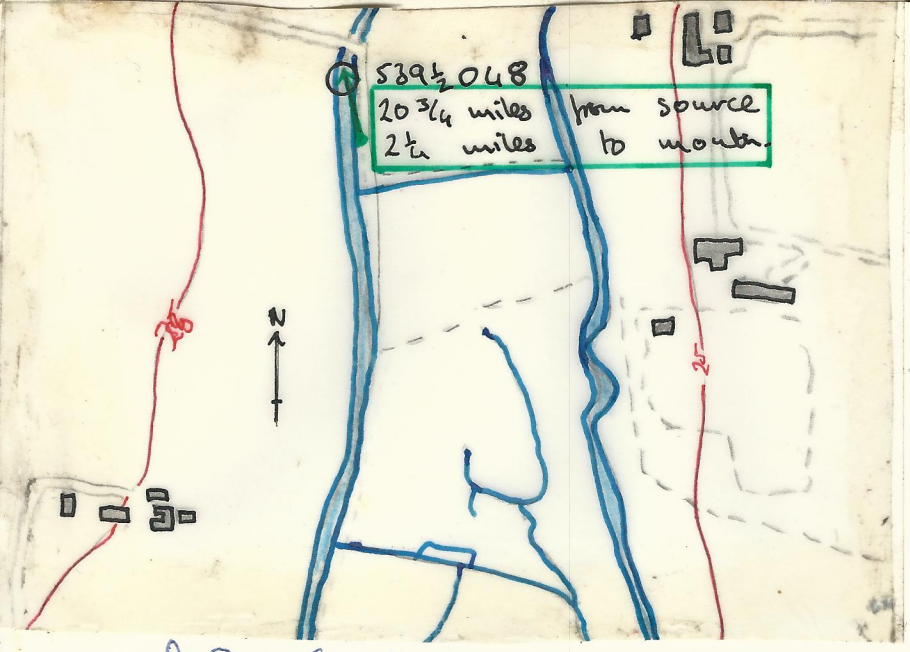


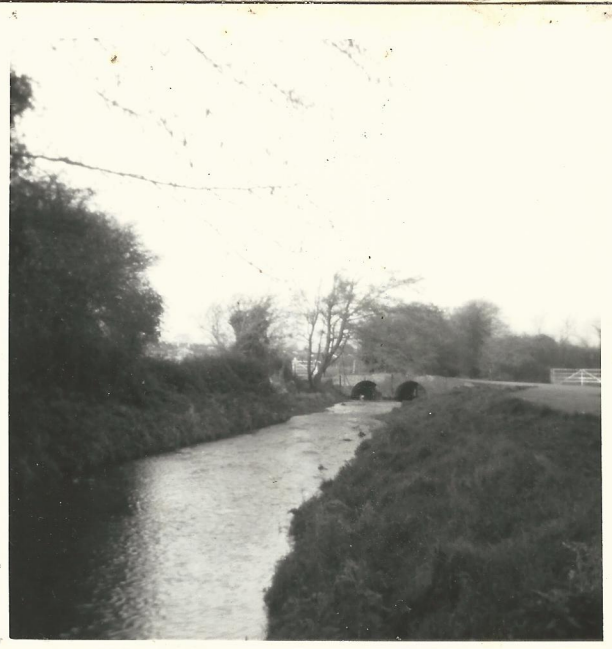


Point Twenty.

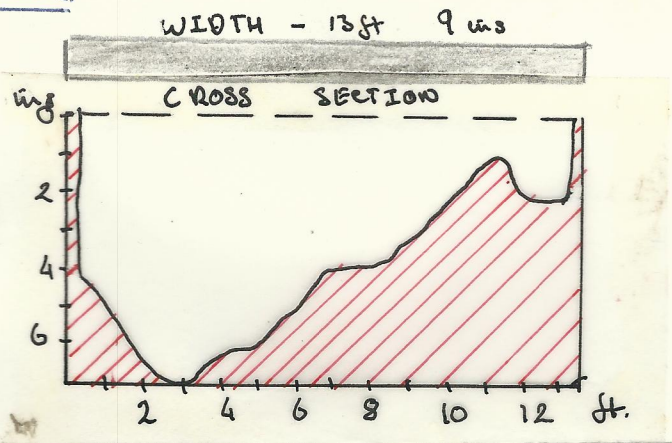
Here the river splits into two for the last time and does not effectively join up until the mouth. One half is an old man-made canal which was built so as to drain the river and thus stop Titchfield being a major port and to make Southampton more important. It is about six foot deep when it splits. The amount of water diverging out of the canal is controlled by a sluice gate. Most of the water goes down the old canal. There is very little flow in the canal but the out-flowing half from the canal is shallow and faster running being about 1ft 6ins deep.





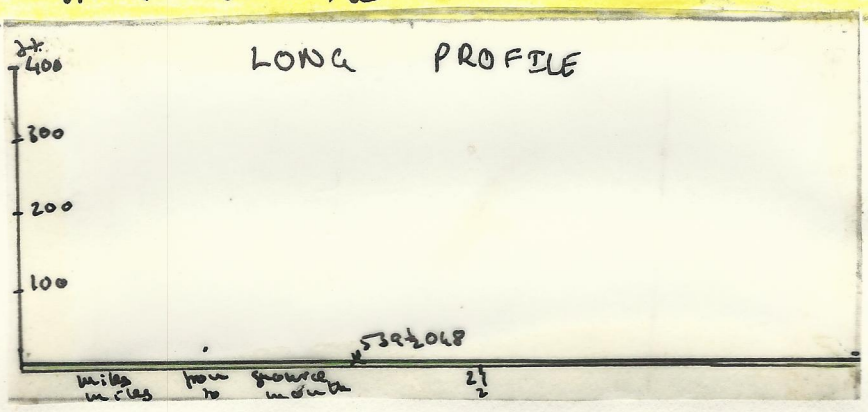


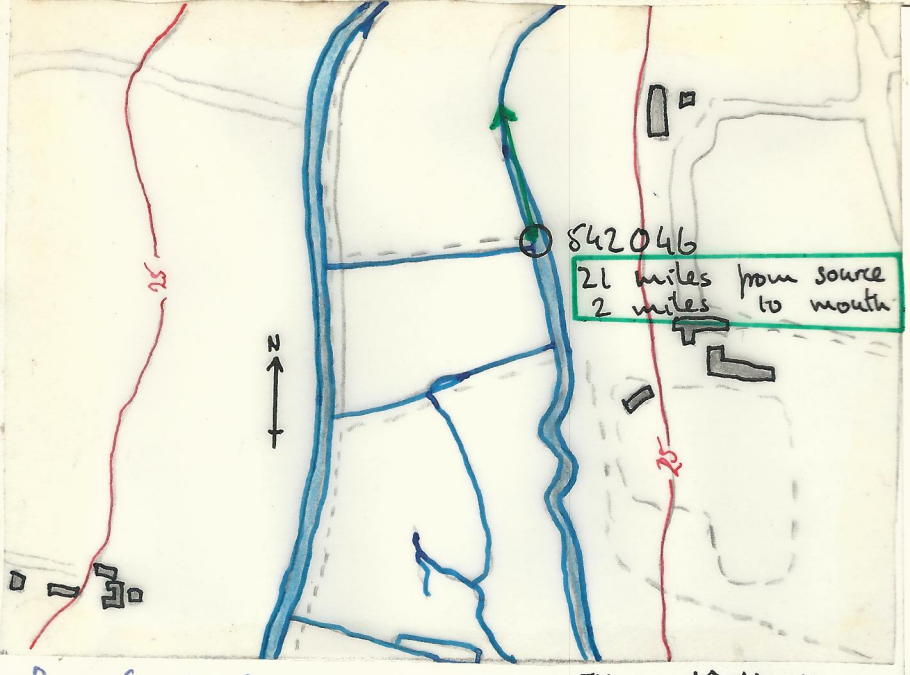
Point Twenty-one



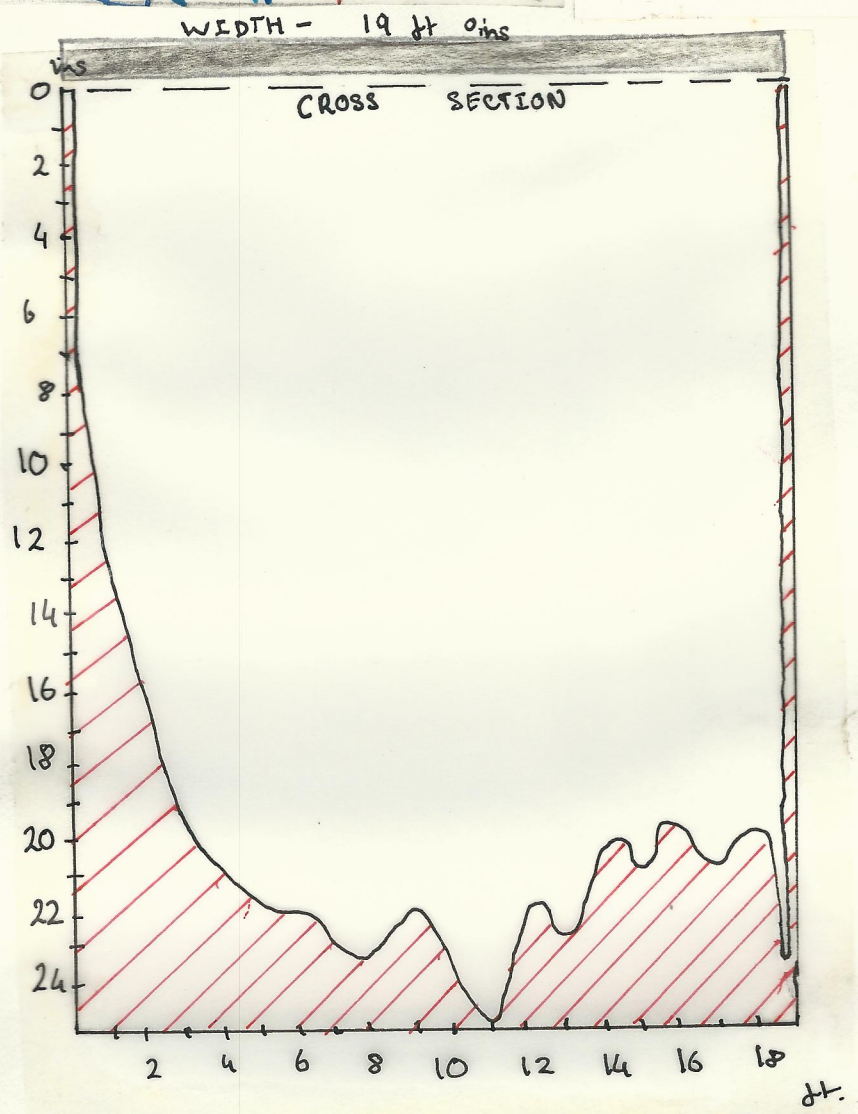
The canal has become silted up as it is out of use. It is very shallow at this point but lower down it is deeper. There is a flow in the canal as it has been diverted into the haven.

SPEED 30 ins/sec

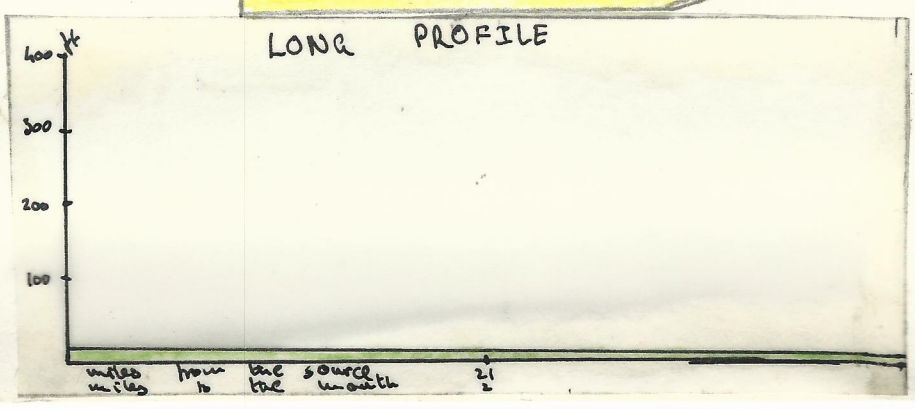




Point Twenty-Two



SPEED 6.6 ins/sec.

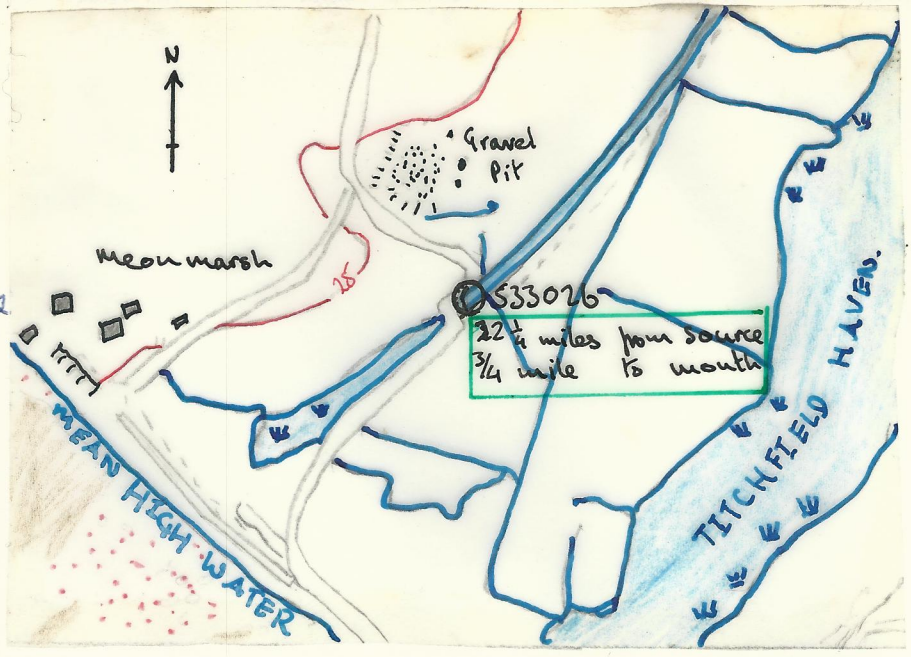


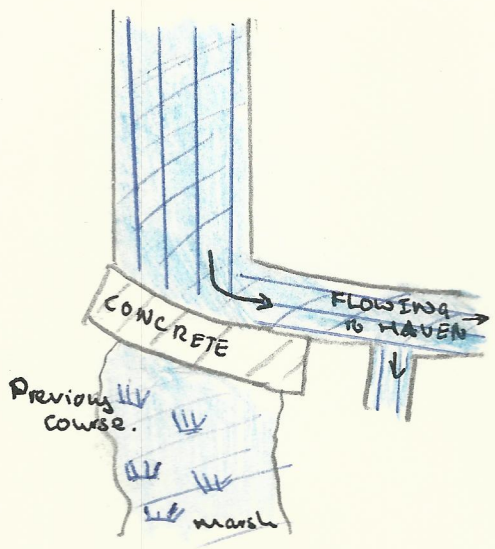
P.T.O. for continuation of Point Twenty-Two

Point Twenty Two Continued

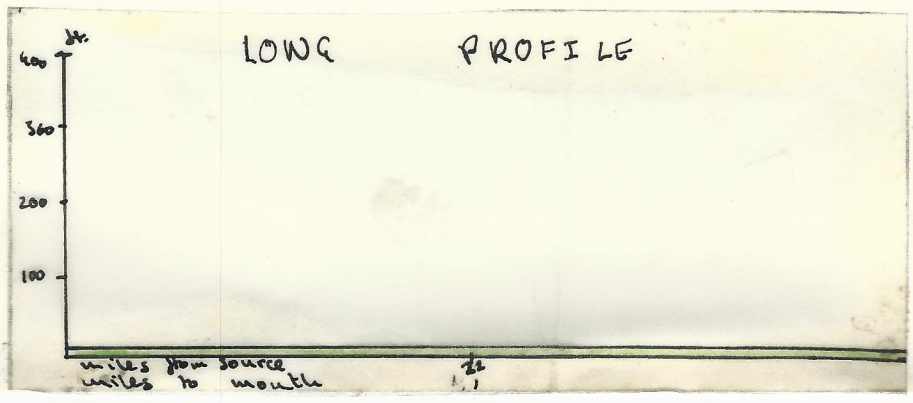
This point is the equivalent of the previous point on the canal. The river now is very deep and slow running. The reason for the sudden gain in the volume of the water is not clear as there have been no major tributaries but water has been flowing from the old canal and also there has been drainage off the land.

Point Twenty-three





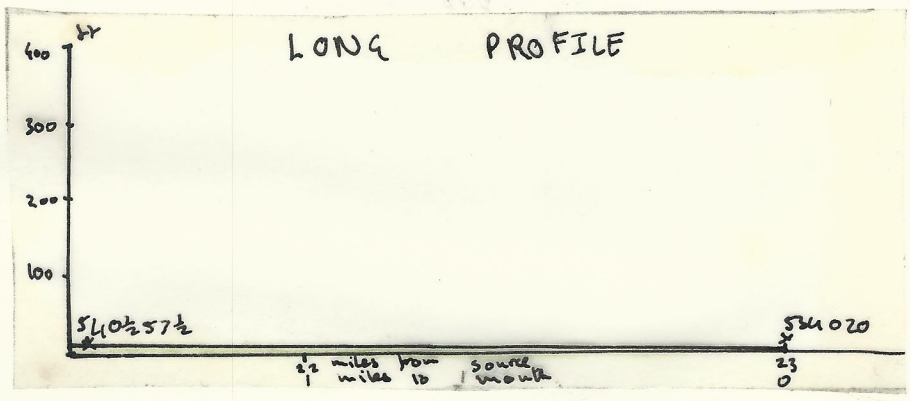
This is the point at which the old canal is finally diverted into the haven. A concrete wall blocks off the old route into Meonmarsh and the water from the canal flows through a series of channels into the haven. It used to flow into the marsh.



Point Twenty-Four - The Haven + Mouth.

THE HAVEN

THE MOUTH

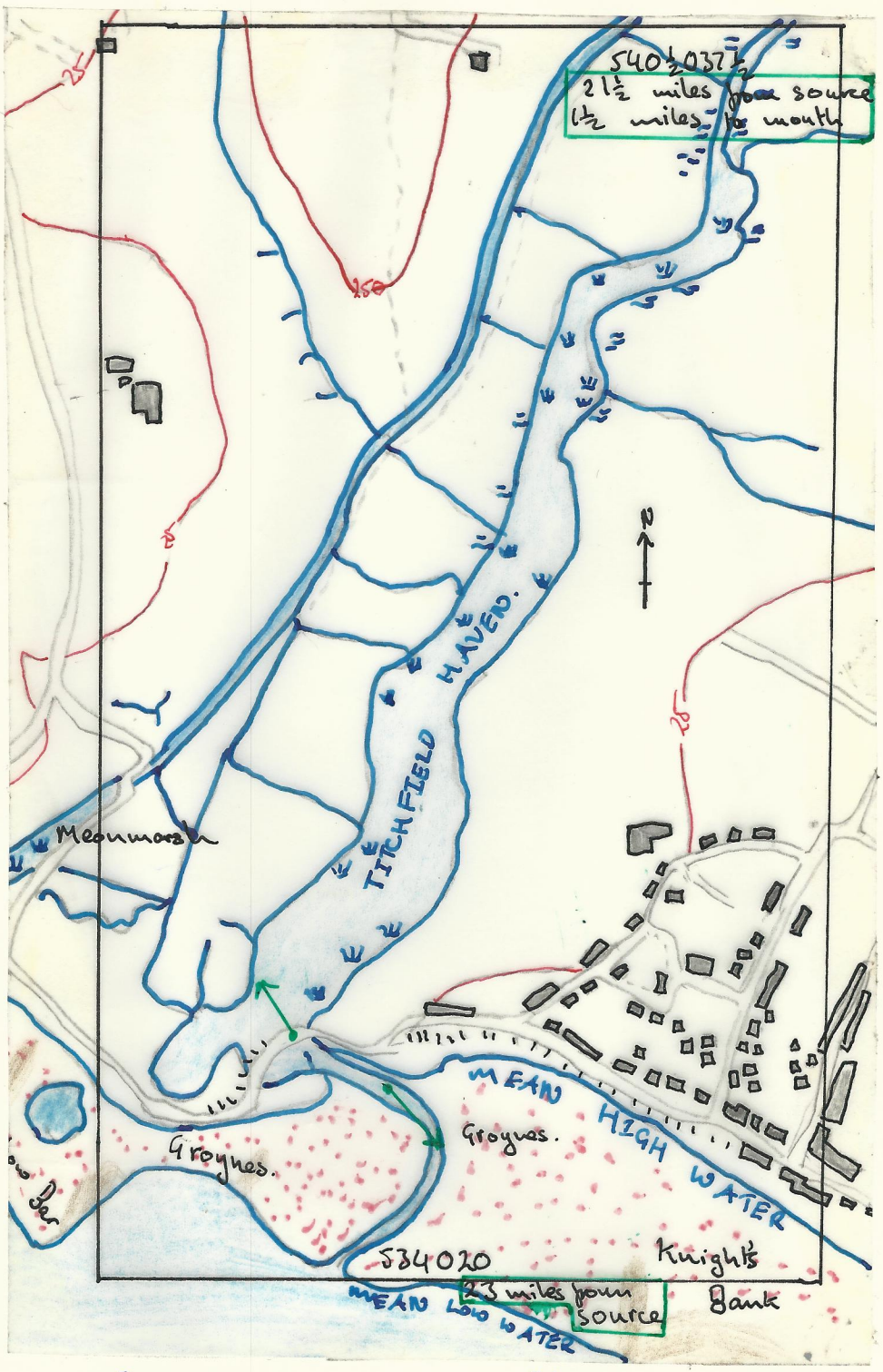


The Haven is an area of marsh and channels which is slowly being drained. It is an expanse of open water surrounded by tall marsh reeds.

The mouth is in the form of a sand bar which has been formed by the prevailing winds and tides. It is now controlled by groynes and a concrete wall.

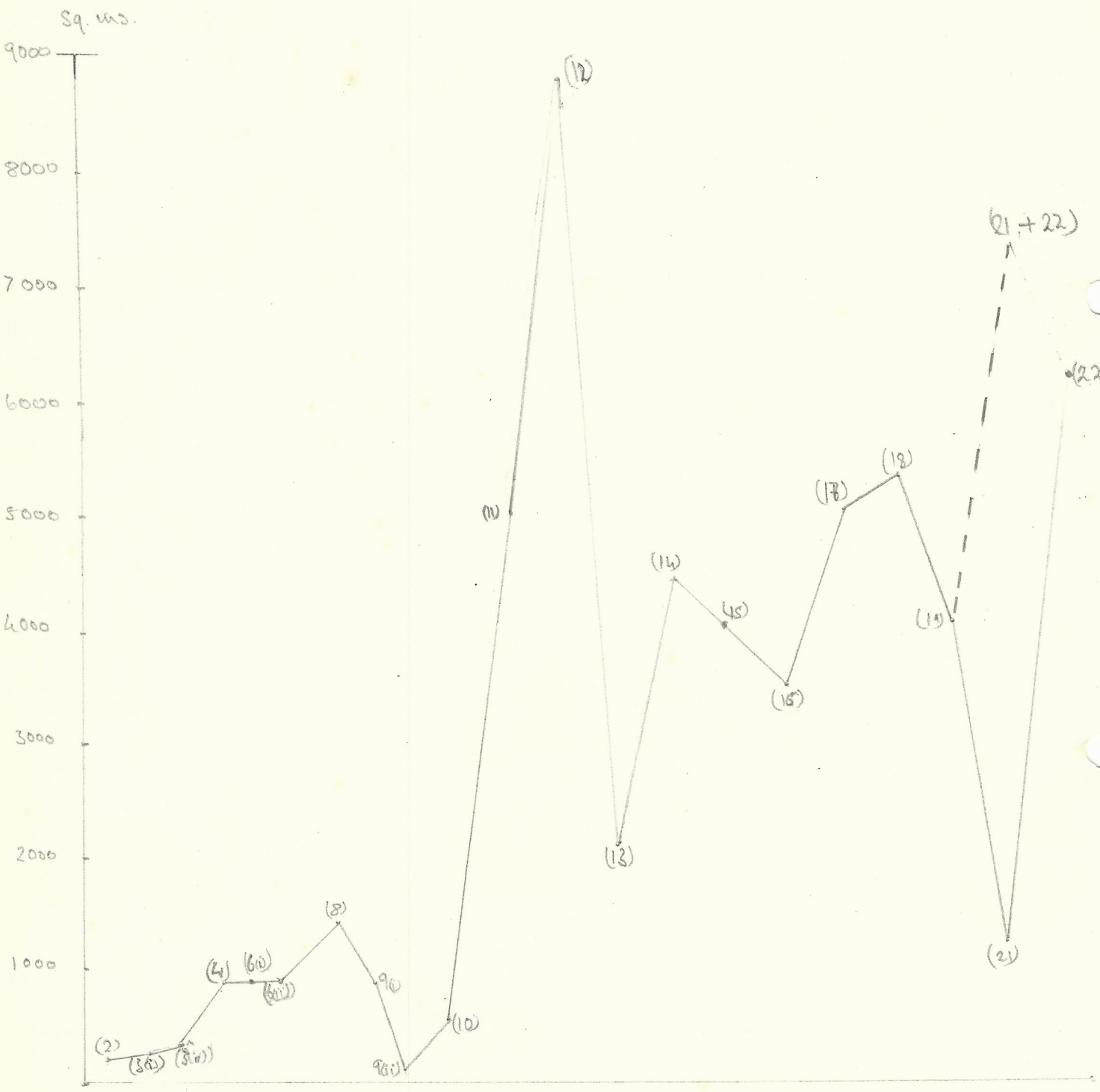
P.T.O for Map of Haven and Mouth.

Point Twenty Four Continued.



Scale of map : 2½ : 25,000, or. 1: 1,000.

VARIATION OF CROSS-SECTIONAL AREA AS THE RIVER PROGRESSES



Numbers refer to survey points.

Cross-sectional area = greatest depth × width.

RESULTS OF THE SURVEY

From the survey on the River Meon it can be seen that the river does not increase uniformly as it progresses towards the sea. The river increases slowly as it flows towards East Meon (6722) but after East Meon it slowly looses water until in Westbury Park (6523) it has been reduced to a mere trickle. After Westbury Park it increases slowly in size until at Point Twelve there is the greatest cross sectional area - 8,802 sq.ins: (Area taken by width x greatest depth). From then onwards the cross sectional area is between about 3,500 sq.ins. & 5,500sq.ins. apart from Points Thirteen and Twenty-one which are about 2,000 sq.ins. and Point Twenty-two which is 6,200 sq.ins. The reason for this change in volume is not altogether certain. In the "Petersfield Post" (December 23rd, 1975) a farmer, who has studied the Meon for twenty-five years, put forth his reasons. He said that the agricultural use of the land took out a lot of the water and so did natural causes. The farmer quoted such figures as: "....if the grain yield is 30 cwt an acre (3,360lbs) each acre of crop will require about 2,250 tons of water to grow it". The water board also takes water from bore holes which otherwise would flow into the River Meon. It also can be seen that the amount of water is affected by the geology of the area and the long profile.

The speed of the river is affected by the volume of water and the gradient which is given by the long profile. The speed did not increase or decrease uniformly as was expected.

The bottom of the river varied from being small pebbles and gravel to thick silt. Normally there was some silt with flints and when the area was of chalk the silt was largely of chalk.

From the survey it was seen that the river was affected by both man and nature. The geology and gradient of the area affected it and man increased its volume by draining the surrounding land into it.

A S S E S S M E N T

Thus it can be seen from the survey that the River Meon cannot be described as a typical chalk stream. It has a very unusual course, starting off flowing north and eventually moving round and flowing south. The way the volume of water changes is unusual and unexpected. The river does not fit well into the classical pattern of having a beginning, a middle and an end shown on the long profile diagram. The river can really be divided into an upper and lower half. The upper half ends at about Point Eighteen, 15 miles from the source. Here the gradient is much gentler and this can be seen as the river deepens and becomes much slower.

A C K N O W L E D G E M E N T S

Southampton University

"A Study of the Meon Valley to Consider the Relationship between its Settlement and Physical Characteristics." A' Level Special Essay by D. K. Rogerson.