

Dundee — What Might Have Been!

Introduction

A few weeks ago I met an old friend, Hamish Ramsey, one time Chief Planning Officer of Tayside Regional Council, while paying a brief visit to Barnhill shops for my morning paper. Hamish is well aware of my interest in Dundee's history, particularly as it relates to the river and his, "I've got a small paper I would like to pass along to you. It's about tides and things that I don't understand but I thought you might like to see it"; caused me to wonder what it was all about as it was not for the first time in these past few years that Hamish had lit the blue touch paper that activates my interest cells, so I visited Hamish at his abode and picked up the paper he had been so keen for me to have and learned that Imes Duffus had passed it to him some time earlier. The following is the fascinating result.

The 'Dundee Warder' 1841

The spirited and well sustained exertions of our townsmen have secured them the noblest harbour in the country: but their labours are not complete until they make the access to it in all respects worthy of it, and until they secure it from being in all time to come either silted up or ruined by sandbanks.

The above statement appeared in the 20th of April 1841 edition of the '*Dundee Warder*', and was I presume, written by its editor as an introduction to a paper presented by one John Rooke, Esq., of Akehead in Cumberland that the 'Warder' had agreed to publish. Rooke in his day was well regarded as an expert in the promotion of British Industry. He was a writer on political economy and geology in particular the transport sector, projecting a system of Scottish railways from Edinburgh and Glasgow to Newcastle and Carlisle then northwards to Dundee. His recognition of the necessity of securing a suitable ferry link across the Tay for a railway leads to provocative and well considered arguments.

Improvement of the Ferry Passage and Navigation of the Tay — John Rooke Esq.

In his analysis of the opportunity of securing a ferry link across the Tay, Rooke demonstrates his wide knowledge of tides, not only local but general in the North Sea. Nowadays we are inclined to assume that only with the advantage of technology introduced and developed over the past 30 or so years we now have a better understanding of nature's ways. Not so!! Rooke's paper was written 172 years ago and he had the temerity to suggest that the developments that had taken place to improve the port of Dundee, first by the Harbour

Commissioners from 1815 and thereafter by the Harbour Trustees from 1830, had somehow had a detrimental effect on the natural hydrographical dynamics of the river adjacent to the port. His view was that since the port was originally located at the apex of the natural Bay of Dundee the undisturbed tidal flows created a scouring effect and provided a constant, predictable water depth at all states of the tide. However, by engineering the construction of the improvements to the port in the way that it had been done over the previous 20 years the port had forever saddled itself with a commitment to dredge in order to maintain the water depths required to keep the port viable. Roote's forthright opinion is fundamentally correct but his conclusion ignores the fact that trade at the port had increased substantially due to the efforts of the Harbour Trust and was predicted to expand even further. Such expansion meant that larger ships with deeper drafts would use the port and demand deep water facilities that the Trust in its wisdom had anticipated.

One must not get too hung up in criticising Rooke's paper with the benefit of hindsight and it is best to consider later what might have come to pass had his notions been allowed to materialise.

His view of a suitable ferry link across the Tay was that it was a material link in the various chains of a Scottish railway system that should radiate from a midland centre but preserve for the metropolis of Scotland what had already been conceded to London as the British metropolis from where all those concentrated lines of national railways which the capital of a nation depends emanates. He highlights that in England railways already existed or were in the process of being constructed that linked London directly with all the major English ports: Liverpool, Bristol, Hull, Newcastle, Southampton, Portsmouth, Brighton, Dover and more. In order to provide continuity within the system inland cities became junctions where the various rail lines intersected to cover the maximum area of the country with minimum effort. Manchester, Leeds, York, Derby, Leicester etc, were, or soon would be an integral part of an efficient national railway system in England..

He asks a burning question. *"Shall Scotland deny a rule -- so fully consistent with her prosperity, her convenience, and her unanimity -- which has been acted upon in England co-extensive with all her provinces? Surely not! Glasgow may be allowed every demand it may fairly claim; but it is not the national capital of Scotland, and ought not, by any means, to have such a favour conferred upon it artificially"*. Strong stuff!! He does provide an insight into the political thinking of the day: Edinburgh was the capital of Scotland and should remain so. In his mind Rooke considered Edinburgh to be the centre from where rail

links to all parts of Scotland and those to England should radiate. In fact Edinburgh should be regarded as Scotland's London in terms of rail transport.

He goes on to focus upon the issues relating to the navigation of the Tay and introduces the concept of a 'Rendel's Ferry Bridge' across the river. James Rendel was a civil engineer of the Thomas Telford school and among many of his other claims to fame was his design of floating platforms to facilitate river crossings. These platforms made use of steam hydraulic power whereby with the use of wires and chains his platforms could transport goods, including railway carriages, across rivers. He had designed many successful units operating mainly in the south of England in short crossings which became known as 'Rendel's Ferries'. John Rooke's notion that somehow a 'Rendel Bridge' could be designed and developed to serve as a Tay crossing seems to have been at the heart of his paper.

He discusses the tidal structures of the Tay Estuary and refers often to 'parallelism' that may simply have been in reference to how the navigable channel of the estuary and the reaches adjacent to the port of Dundee ran mainly parallel to the shorelines on either side. In considering a ferry link he explores the advantages the port of Dundee had in developing its trade; but he goes on to mention '*some striking defects which require to be fully reconciled, as shall be done ere I part with the ferry question here at hand*'.

'The Newport Ferry pier is too distant from the Ferry pier in Dundee, and the direct line of navigation interrupted by sandbanks, to admit the application of Rendel's navigation bridge, which works so admirably at Devonport, on the lichen at Southampton, and other places. Whilst this description of ferry-bridge may be considered as indispensably requisite in establishing a railway ferry from the southern shore of the Firth of Tay to Dundee, the depth of water, the compression, the parallelism of the shores, and the consequent ease of the current, between Ferry-Port-on-Craig and Broughty Castle are certainly well adapted for the application of Rendel's ferry-bridge, yet combined, however, with material objections.

It then becomes somewhat obvious that Rooke was not at all in favour of a Tayport (as Ferry-Port-on-Craig is called today) Broughty Ferry link. The reasons he gives are interesting but not really sustainable. He says that Tayport is five miles distant from Dundee via Broughty Ferry and it would be possible to link Tayport and Dundee by a rail ferry, a journey of some three and a half miles by water. He then dismisses the advantages of this distance as '*trivial as compared with other considerations*'. The 'other considerations' he alludes to are that '*a chief railway station would absolutely be required at Dundee for the new railway (besides that of the Arbroath Railway), a second station would be required at Broughty Castle for the*

new railway (besides the present station), and a third station would be called for at Ferry-Port-on Craig. He believed that such requirements would be too complex, cause unnecessary delay. His language in this section of his paper is colourful and bent towards his dismissal of such a link. The arrival of trains in opposite directions at Broughty Castle would be certain in producing vexations to passengers that were unavoidable. On the contrary, if all the various lines of railway were worked from Dundee alone, an expensive establishment at Broughty Castle would be uncalled for, and all the various trains would move forward to their respective destinations without delay, disappointment, or confusion. A double terminus on the Dundee and Arbroath Railway, less than four miles distant from each other, is an objection to a ferry bridge between Ferry-Port-on Craig and Broughty Castle which cannot be satisfactorily adjusted, for the reason already given.

His mind was certainly made up on the issue and he goes on to say that neither Newport nor Ferry-Port-on-Craig were available in providing a proper ferry for a railway terminus in the direction of Dundee for various reasons so other matters had to be considered before any view could be given on modifications that would be required to be able to adapt to the project in hand (his project, a ferry bridge across the Tay!)

In pursuing his theme, Rooke refers back to his original analysis of the hydrographics of the navigation channel from Ferry-Port-on-Craig and Broughty Castle, upstream to a line between Woodhaven and Magdalene Yard. He revisits his notion that the developments at the port had interfered with the potential of creating a Newport/Dundee rail ferry link.

Every step in advance towards deeper water, however, and the attainment of better security for sea vessels, necessarily drove the navigable channel of the Tay more from the Bay of Dundee into the opposite and receding Bay of Newport, and also promoted an extension of a travelling series of sandbanks from the westward, and more especially on the side of Dundee and Magdalene Yard, by a flowing tide bearing silt along with it, which a diminished draught of the ebb tide had force enough to trail partly along only, leaving it (the silt) in the very middle of the channel, and effectually barring the navigable channel along its northern parallel.

If we consider the results of engineering on the side of Dundee and that of Newport in combination, therefore, in their existing form, they cannot be adapted to a railway ferry – are exceedingly detrimental to the navigation of Dundee in the meantime – must defy the temporary expediency of preserving deep water by either dredging or sluicing in the end, and

pervert that fair navigable channel along the estuary of the Tay, which Providence had pre-ordained in the purity of physical agency.

Wow!! This paper was published in the *Dundee Warder* at a time when the Trustees of the port had embarked upon major works that would ultimately propel the facility to a level where any further increase in trade could be handled with relative ease. The jute trade had started to flourish and it was the merchants who were calling, nae demanding, port facilities to suit their expanding needs. Such was the projected increase in the import of goods from the Indian sub-continent that the Customs and Excise reached an agreement with the Harbour Trust to jointly build new offices at the north west corner of the proposed new Victoria Dock, which was under construction about the time Rooke wrote his paper. I suspect that Dundee Harbour Trust welcomed the publication of Rooke's paper like a hole in the head because, without doubt, his opinions on how the port's engineering works had affected the tidal dynamics of the inner estuary were correct in as much as they had caused a movement and build-up of the Middle Bank to the east of its natural historical position; thus providing an impediment to the introduction of a rail ferry link between Dundee and Newport.

It was a classic impasse between the Trustees and Rooke. Expand the national rail links or expand the port. There may be a record somewhere of how the Trust dealt with the fallout from Rooke's paper but it is likely that it provided the politicians of the day with enough ammunition to keep Rooke's notions alive for some time. As it happened the developments at the port continued uninterrupted even though Rooke provided a solution to the apparent dilemma.

The remedy is obvious (he writes). Were a line of railway carried from Ferry-Port-on-Craig, within the tidal line of high water, at the receding point of the shore at Northfield, and continued westwards in the direction of Middlebank, on the parallelism of Dundee, and to a sufficient extent, the port of Dundee would thereby do more than regain all the defective engineering has lost, an efficient railway ferry would be formed, available at all times of the tide, and the best ferry apparatus of our day adopted which science and skill can realise. This may seem a bold project; yet it is attainable, as the pier proposed would not face the current, press only on its parallel, and therefore regular masonry would not be much needed. Nor is this the sole form in which the object in view may be obtained. Preserving the parallelism of the Firth of Tay, by projecting a similar wall from the most advanced point of the Ferry harbour at Dundee, in a south-western direction, and by such means restoring the original incidents and the figure of the Bay of Dundee, might not only answer, but render the pier of Newport available for the application of .RendePs navigation bridge; or works

of the description here stated might be undertaken on both shores of the Firth of Tay, with a view of continuing its parallelism more to the westward than is the case at present. It might be made a stipulation with the Crown that the ground saved (reclaimed) by embanking should be given up to cover the expense of the improvement; and we are all aware it would be amply ^{suff} to do so.

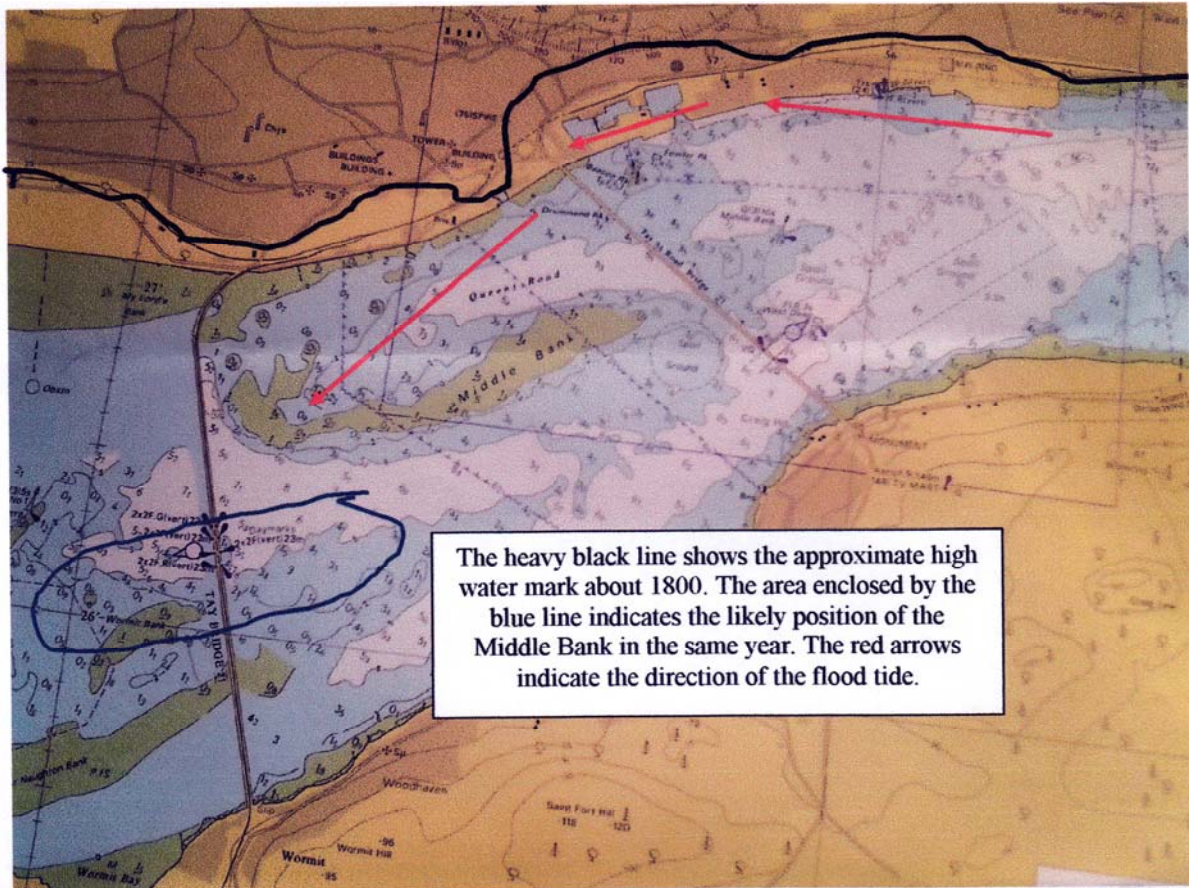
Certainly a bold western pier, carried from Northfield in the direction of Middlebank, for a mile in length, would be more sure in effecting the objects desired than any other plan that seems available. Middlebank would speedily vanish before a battery so powerful as the waters of the Tay brought to bear upon it. Rude framework, adequate slops and loaded faggots with heavy rocks in abundance, hut pressing against a parallel current, would seem to the most of what might be called for. At any rate, I freely submit to public criticism this rough sketch of my ideas, in the hope of rousing the people of Dundee to a full sense of their proper interests. I propose writing again on this topic.

Reaction

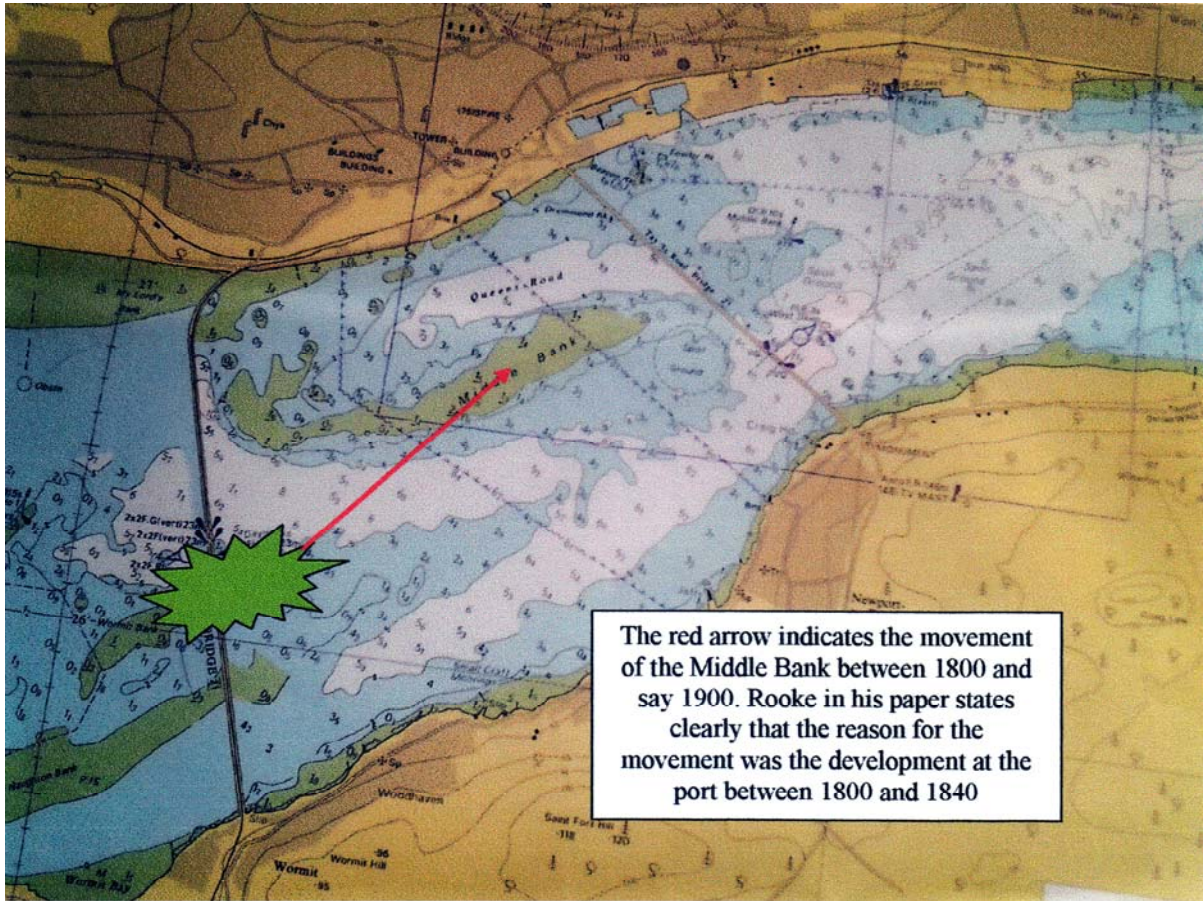
I could find no record of local reaction to the contents of Rooke's paper in my short searches; but it was bound to have provoked interest and, as I mentioned earlier, probably was regarded as a bit of a nuisance by the Harbour Trust.

John Rooke Esq., was far from a crank and although he dismissed a Tayport/Broughty Ferry rail link almost out of hand in his fixation towards a Newport/Dundee link, his theory on how the navigation channels of the Tay Estuary could be improved was absolutely sound and I believe that had his advice been acted upon the port of Dundee could still have been developed along the lines we see it today.

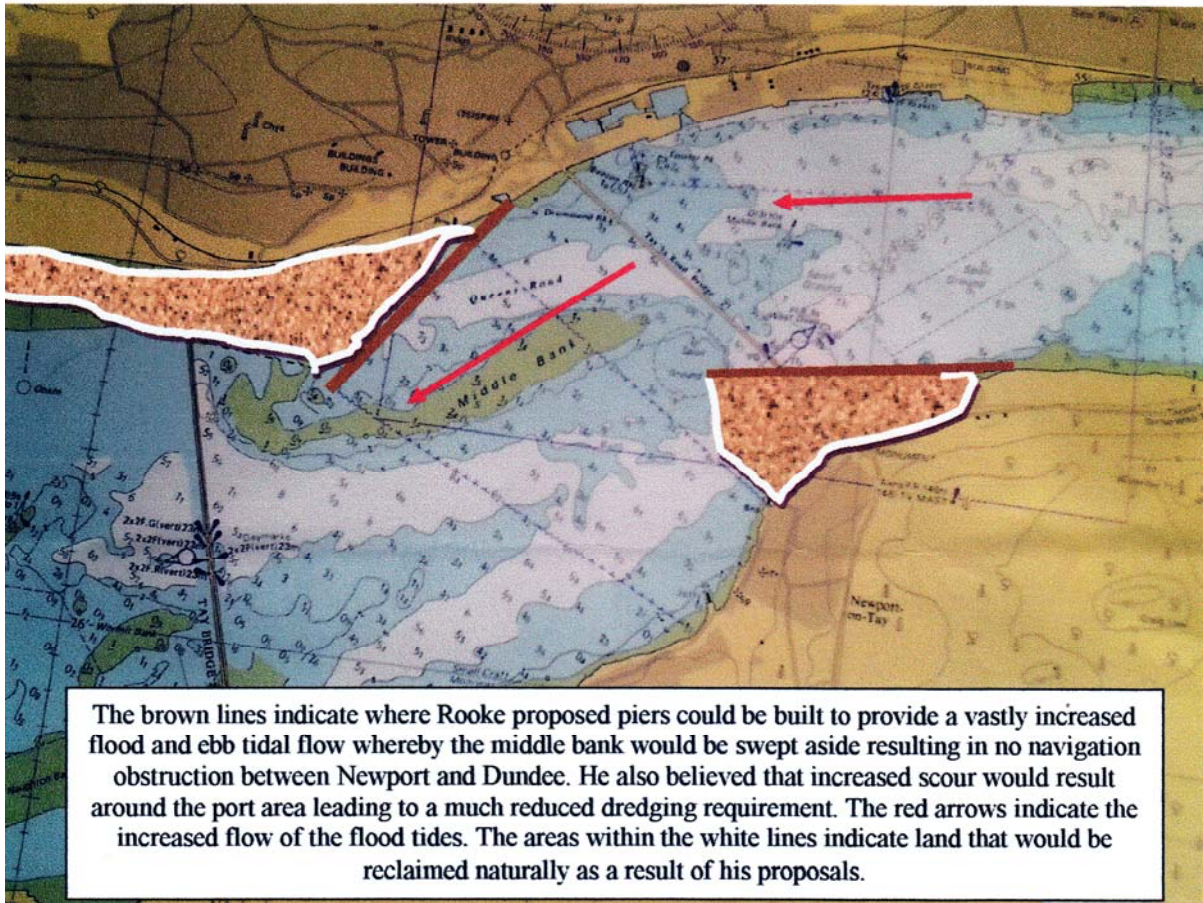
The following sequence of illustrations using a section of Admiralty Chart 1481 for educational purposes, provides telling evidence in favour of Rooke's opinions, strongly put in his paper as regards the harbour developments up to and including 1841.



The heavy black line shows the approximate high water mark about 1800. The area enclosed by the blue line indicates the likely position of the Middle Bank in the same year. The red arrows indicate the direction of the flood tide.



The red arrow indicates the movement of the Middle Bank between 1800 and say 1900. Rooke in his paper states clearly that the reason for the movement was the development at the port between 1800 and 1840



The brown lines indicate where Rooke proposed piers could be built to provide a vastly increased flood and ebb tidal flow whereby the middle bank would be swept aside resulting in no navigation obstruction between Newport and Dundee. He also believed that increased scour would result around the port area leading to a much reduced dredging requirement. The red arrows indicate the increased flow of the flood tides. The areas within the white lines indicate land that would be reclaimed naturally as a result of his proposals.

Looking at Rooke's proposals with an open mind, it is possible that had they been incorporated in the ports development plans after 1840 the Trust would have had no need to change direction except perhaps to plan to construct Rooke's piers over say, 25 years from 1841 to 1866. Perhaps the dredging burden would have been less and maybe the first Tay Railway bridge would have made use of the lands reclaimed as a result of Rooke's piers. One matter that somehow was either ignored by Rooke or he knew little of was the underwater rock strata that exists from south of what was the old Earl Grey's Dock, including Fowlers Rock, and along the south side of the wharves as far as the Eastern wharf. Water depths off Eastern wharf have never been more than 4.5 metres at low water springs. So his suggestion that the sluicing effect resulting from his proposed piers locations would solve the port's depth problems for all time was, perhaps, tongue in cheek.

Reality

Given that Rooke's paper has now been scrutinised, it is important to consider what did happen in regards to a Tay rail ferry link in the decade after Rooke's paper was published. One could easily conclude that he got it wrong by dismissing the potential of a Ferry-Port-on-Craig/Broughty Castle rail ferry link; but he must be given some credit also in that he concentrated on what he considered the bigger picture, one that encompassed the whole navigation structure of the estuary; but it was only five years after the publication of his paper, in 1846, that a railway company bought the rights from the Laird of Scotsraig to operate a ferry at Ferry-Port-on-Craig. The latter location and Broughty Ferry were quickly developed as rail link ports; paddle steamers were built with two lines of rails on deck to accommodate goods carriages that were lifted on and off by a cradle. The link became hugely successful, so much so that a large ferry, the PS 'Robert Napier' was built and brought into service around 1850. It is said with authority that the 'Robert Napier' was among the first roll on/roll off ferries in the world; passenger and freight carriages could be rolled on board, probably a first as well . So at last a true rail ferry link was established across the Tay and for the next 25 years it was able to satisfy the ever increasing demands on the service, until in the middle 1870s it could no longer cope. The first Tay rail bridge was opened on the ^{1st} June 1878 and the rail line was extended from Ferry-Port-on-Craig to Wormit. The Tay bridge disaster of the 28th December 1879 meant that the ferry link to Broughty Ferry was reintroduced and it remained in place until the new Tay rail bridge opened in 1887.

The railway company's agreement with the Laird of Scotsraig to operate a ferry service contained a clause that obliged the company to provide a rail ferry link from Ferry-Port-on-

Craig so long as the railway company or its successors existed. This onerous clause was honoured by the company and the paddle steamer 'Dolphin' continued to provide a service right through to 1920 when it finally was brought to an end.

What Might Have Been?

If Rooke was able to return to this world of 2013, he would probably marvel at how transport links did develop – the rail bridge followed by the road bridge 80 years later – but I wonder if he would have been saddened by what he considered as a missed opportunity?

A niggle must remain in the minds of today's academics and planners. What if the powers that were the leading lights and decision makers of 1841 had embraced Rooke's notions. It is entirely possible that a sustainable deep water navigation channel could have resulted to the west of Dundee, certainly as far as Newborough. A rail bridge too could have been constructed; not along the route taken by the one opened in 1887 but one that took account of the advantages gained by Rooke's piers to the north and south of the inner estuary. The shores of the Tay westward of the current rail bridge site to the north, may well have been able to have been reclaimed much further to the south than at present. The vast acres of sandbanks entirely visible today on the north side of the estuary at low water to the west, would have given way to wonderful, fertile, cultivated lands increasing the agricultural production of the Carse of Gowrie by 50% more than it is today. The river Tay from its confluence with the Earn would have been confined to less than half a mile in width but still able to cope with the huge volumes of tidal water that daily and freely flow. Such controlled tidal energy could probably be harnessed to provide electrical power to satisfy, not only Dundee and its environs but most likely the whole of Scotland.

I am not too sure whether I held Rooke's hand or he held mine during my journey through his paper. I suspect it was a bit of both.