

RIVER OUSE
(YORKS.)
CATCHMENT BOARD.

REPORT

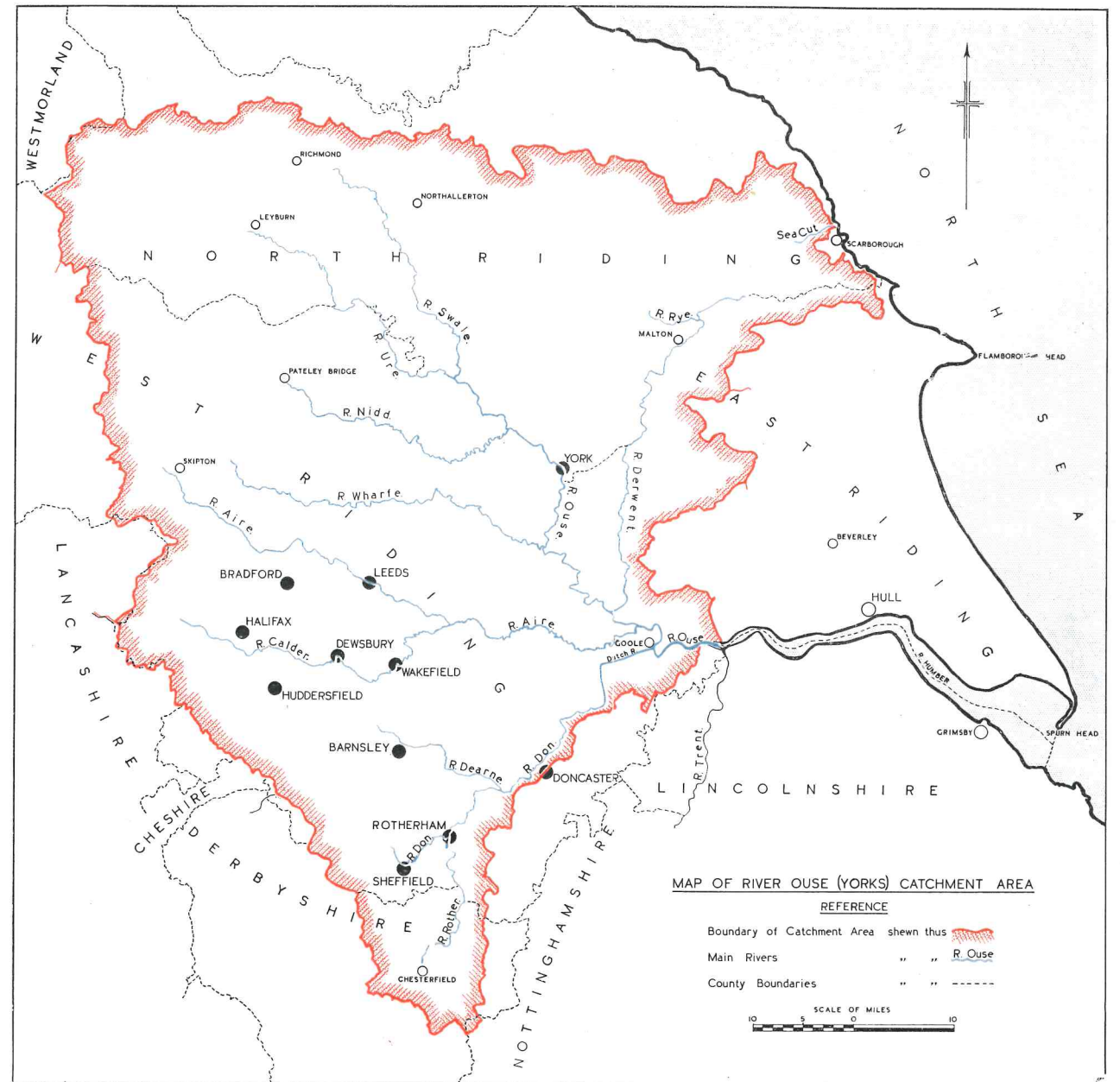
for the year ended
November, 1939.

1939

7, Langcliffe Avenue,
Harrogate.

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River Ouse (Yorks.) Catchment Board.

ANNUAL REPORT

for the Year ended November, 1939.

INTRODUCTION.

It has been the practice of the Board since they were first constituted to prepare for circulation an Annual Report which at one and the same time has afforded them an opportunity of giving an account of their stewardship, and also of disseminating useful information on the activities of Drainage Authorities within the Catchment Area with a view to bringing home to all concerned the importance of land drainage.

Up to the 1st September, 1939 when a State of Emergency was declared to have arisen by reason of the war which is unhappily raging, the work of the Catchment Board was pursuing the even tenor of its way as in former years.

As forthcoming events were casting their shadows before, the following observations made by Sir Reginald Dorman Smith the Minister of Agriculture and Fisheries in an address given by him at the Annual Meeting of the Catchment Board's Association held on 16th May, 1939, will doubtless prove of interest :—

The Function of Catchment Boards in War.

Land Drainage and flood prevention is essentially a "long-term" service, and when Catchment Boards took up their task it was with the hope and the expectation of a long period of peaceful and uninterrupted development, in which they might catch up with the accumulated work that was awaiting them on their appointment. Unhappily it cannot be said that this expectation has been completely realised for, to-day, to use a now-familiar phrase, if we are not at war, we cannot say that we are at peace. I do not doubt that you, like all of us, have been wondering what part you will be called upon to play if war breaks out.

The work of the flood prevention is just as important in war time as in peace time, perhaps even more so. If war should come we shall be doing everything in our power to increase home food production; if land is to be maintained in a condition of high fertility, it is essential that the arterial drainage from it shall be in good order. It is true, of course, that flood prevention is not solely an agricultural service, for the urban populations also receive direct benefit, but it is equally true that the effective draining of the greatest part of the agricultural land of England and Wales depends ultimately on the efficiency of your Boards.

In war time your work would go on with added importance. The event of war, would however, rather alter the relative importance of the different aspects of your work. Much of the work that is being done—and this applies particularly to large-scale works of fundamental importance in the planning of a land-drainage system—is long-term in its objects, and may not in some cases produce considerable effects on the land drained for, perhaps, some years. In war time such work would probably have to be relegated to the background; while we concentrate all our efforts on works of immediate importance, producing immediate results. Our immediate duty seems clear—to press on with major long-term works as energetically as possible now, in peace time, so that war, if it comes, will find them as far advanced as possible.

Air Raid Precautions.

I understand that your Boards have already considered the question of air raid precautions, and are proceeding to work out your requirements in this direction. Little imagination is needed to see the importance of these for flood prevention schemes. Like all matters of this sort, the financial side is important: and I note that the Association, on behalf of the Catchment Boards, is discussing these matters with the Home Office. Such discussions as this will illustrate the advantages of such an Association—and incidentally also illustrate that those Boards which remain outside, benefit from the activities of those who belong.

Supply of Oil.

There is one other point I should like to mention before leaving the subject of preparations for war: that is oil supply. Oil supplies are bound to become a matter of the first importance in war time, for many purposes: and oil is among the necessities for the maintenance of our land drainage system, both for dredgers and for pumping stations. While all necessary steps are being taken to safeguard oil supplies in general, it will be only common prudence for those Catchment Boards and other drainage authorities to store substantial oil reserves in adequately protected storage accommodation, and I have no doubt that you are seeing to this matter, and urging those Internal Drainage Boards which maintain pumping stations to do likewise. The consequences of any shortage of oil supply, even for a short time, for pumping stations might easily be disastrous.

Furthermore, in a circular letter from the Ministry of Agriculture and Fisheries dated the 30th September, 1939, there appeared the following paragraph:—

“I am directed by the Minister of Agriculture and Fisheries to inform you that he has had under consideration the continuance during the war of land drainage schemes. The Minister's view is that an essential pre-requisite to the success of the food production campaign is that agricultural land should be adequately drained; and it is therefore very desirable that any work should be proceeded with which is calculated to maintain or improve substantially the productivity of considerable areas of land within a reasonable period. In this connection, the Government's decision to plan for a war of three years' duration should be borne in mind.”

At the first meeting of the Board in September after the outbreak of hostilities the question of how best the Board's activities could be continued was considered when it was realised that ordinary peace time procedure by several Committees would no longer meet the case.

It was unanimously decided therefore to set up an Emergency Committee and in the meantime suspend the meetings of all other Committees of the Board.

At the same time it was decided that the Emergency Committee should meet as and when required and report their proceedings to meetings of the full Board to be held once every two months.

The Emergency Committee was selected as follows:—

Alderman C. W. Beardsley (Chairman of Finance Committee).

Alderman Lt. Col. E. J. Clarke.

Councillor R. Colver (Vice-Chairman of the Doncaster Area (Mining Provisions) Committee).

Alderman E. Cruikshanks (Vice-Chairman of the Board).

C. W. H. Glossop, Esq., (Chairman of the Doncaster Area (Mining Provisions) Committee).

W. Hinchcliff, Esq., (Chairman of the Internal Districts Committee).

Alderman F. Austin Leach (Vice-Chairman of the Finance Committee).

A. Penty, Esq., (Chairman of the General Purposes Committee).

County Alderman G. Schofield (Vice-Chairman of the General Purposes Committee).

County Alderman R. L. Walker (Chairman of the Board and Chairman of the Main Rivers and Works Committee).

Councillor F. Wrigley.

County Alderman Colonel E. York (Vice-Chairman of the Main Rivers and Works Committee and Internal Districts Committee).

Immediately at the close of the Board Meeting which appointed the Emergency Committee, the Committee met and elected County Alderman R. L. Walker as their Chairman and Alderman F. Austin Leach as their Vice-Chairman. They also requested the Chairman in conjunction with the Engineer to submit to them a report for consideration by the Committee as to the drainage works which should be carried out during the remainder of the financial year.

At a subsequent meeting held on the 11th day of October the Chairman and Engineer submitted the following report which was approved by the Committee and adopted :—

MEMORANDUM PREPARED BY THE CHAIRMAN AND ENGINEER OF THE BOARD ON WORKS RECOMMENDED TO BE CARRIED OUT DURING THE REMAINDER OF THE FINANCIAL YEAR.

The following scheme has been prepared in accordance with the foregoing recommendations of the Ministry, with the object of :—

- (a) Postponing as far as practicable all works, the completion of which would not give immediate benefit or protection to productive agricultural land.
- (b) Postponing as far as practicable works which necessitate the use of steel, concrete and timber—all of which are controlled, and which no doubt will increase in price.
- (c) Postponing works which require close supervision which may prove impossible with a depleted staff.
- (d) Carrying out works which will immediately protect lands from flooding, and which form part of the Ministry's approved scheme and thus rank for grant. If such works are postponed, their place would have to be taken by maintenance works on which no grant is payable.
- (e) Employing all the Board's existing plant to the utmost.

In effect the proposed re-arrangement of the programme of works involved :—

- (a) Postponing all new works on the Don and Dutch River not necessary for the immediate protection of agricultural land.
- (b) Postponing all new works on the River Derwent above Elvington Sluice with the exception of the completion of works now in progress at Stamford Bridge Lock and Lock Cut.
- (c) The acceleration of bank reconstruction works on the River Ouse.

In accordance with the foregoing general scheme, it is suggested the various rivers be dealt with as follows :—

Dutch River : Railway Bridge to Mouth.

Unless erosion or slips appear to be about to take place, it is suggested that the piling and stoning proposed on this length be postponed. The embankment between the railway bridge and Swang Clough is somewhat weak, but it is suggested that this be carefully watched and work only be carried out if necessary.

Dutch River : Rawcliffe Bridge to Railway Bridge.

It is suggested that the reconstruction of the embankment below Decoy Clough be proceeded with, and that the reconstruction of the clough itself continue as soon as necessary materials can be obtained.

The outlet of this clough has become seriously obstructed and in view of the valuable land behind, it is considered that the reconstruction is essential. Moreover, the Board's agreement with the landowner renders this necessary.

On the left bank it might be desirable for some strengthening to be carried out as there are certain lengths which leak rather badly.

It is suggested that this work be proceeded with if the plant is available.

Dutch River : New Bridge to Rawcliffe Bridge.

The left bank has been completed and no further work need be carried out.

With regard to the right bank, it is suggested that provided material can be obtained, the stoning of the foot in the neighbourhood of Johnny Moor Long Lane be continued as this bank has always leaked rather badly. Some strengthening of the embankment could then be carried out on the river face at certain points.

The strengthening of the remainder of this length would be desirable if plant and materials are available.

River Don : Jubilee Bridge to New Bridge.

With the exception of the length adjoining the Cowick Road in the neighbourhood of Towns Clough, this bank is approaching completion, and it is suggested it be finished.

The County Council have been asked whether they propose proceeding with the diversion of the Cowick Road but no reply has as yet been received.

If the County Council do not propose to proceed with the work it would be possible to back up the major portion of this length on the land side of the road. Any overflow which then took place would not cause serious flooding. Moreover, the material would be required in any case when the full scheme is carried out at this point.

On the right bank it is suggested that one or two of the slips adjacent to the Thorne—New Bridge road be repaired temporarily by stoning at the foot, and that the banks be made up sufficiently to permit of the construction of a cradge of turf of about 9" above road level. Otherwise the embankment on this side is good with the exception of a length in the neighbourhood of Jubilee Bridge which includes, incidentally, the frontage to our store yard. The embankment in this case should be completed to a safe height though not necessarily to scheme level.

It is also suggested that the widening of the river be completed as far as Jubilee Bridge. Above Jubilee Bridge the left bank has been partially completed as far as Sour Lane Sluice, and very little further work is necessary.

On the opposite side of the river it was proposed to reconstruct the Thorne outfall sewer and construct a retaining wall and embankment. It is suggested that the carrying out of these works be postponed.

With regard to the Waterside Cut, before this is brought into use it would be necessary to complete the cradge banks, regrade the berms, complete the berm sluices, construct the new Sour Lane culvert and sluice, open out the Cut at both ends, and it would be desirable that some form of dams be constructed across the old course.

Unless these dams are fully completed, which would involve materials such as piling and timber which may be difficult to obtain, no protection would be given to the right bank which is one of the main objects of the diversion. As an alternative therefore, it is suggested that the regrading of the berms be completed as far as possible and that they be sown down, that the berm sluices also be completed in order that the land can be kept properly drained, and that a temporary strengthening of the existing right bank, which was to have been abandoned, be carried out. When the berms have been properly grassed over they can be let for grazing.

Above the Waterside Cut No. 7 Excavator is half-way through a big easing of the bend and it is desirable therefore, that this easing be completed.

On the opposite side of the river No. 6 Excavator, which was employed on the construction of the bank in Stainforth East Ings, could be dispensed with as this embankment is already up to a safe height, though not to the full Don Scheme height.

It is desirable that the raising of the Bentley Barrier Bank and the Thorpe Marsh Barrier Bank be proceeded with as soon as the questions of land, etc., have been settled.

It is suggested that two or three excavators together with tractor and scraper be transferred to these works in the early spring, although the raising of the Bentley Barrier Bank could proceed before then provided the necessary land has been acquired by then.

River Derwent.

At Stamford Bridge constructional work on the lock is now practically completed. Repairs remain to be carried out to the downstream masonry walls of the lock channel, after which the steel piled coffer dams will be removed.

Early in October, No. 3 Excavator should commence dredging operations in the Lock Cut, which is almost completely silted up. The present condition of the Cut, which is 330 yards in length, causes serious local flooding, and when cleaned out will also contribute considerably to the quicker discharge of flood water.

All work at Stamford Bridge should be completed by the end of December.

No. 8 Excavator which is at present occupied on the Bank Improvement Scheme at Barmby-on-the-Marsh, will complete operations early in December.

A continual source of anxiety to the Board, the existing bank, which has actually been breached, affords protection to rich agricultural land and it is imperative that this work should be completed.

This scheme, where the existing bank is set back and strengthened, will also necessitate the reconstruction of Fleet Dyke Clough and the removal and re-erection of a boathouse and slipway. In order to arrest any further movement of the new bank it will be advisable to construct a stone retaining wall on the foreshore.

On completion of the above works at Stamford Bridge, and Barmby-on-the-Marsh, the two excavators should return to work on the channel improvement scheme at Wheldrake Ings. Between Elvington Cut and Cottingham Ferry there exist some particularly acute bends and narrow portions of the river, and, as otherwise the scheme for the tidal portion of the Derwent has been completed, it is desirable that the remainder of this work should not be interrupted, or the full benefit of the improvements will not be realised.

River Ouse.

The works proposed are as follows :—

(1) Cawood Bank.

The reconstruction of the right bank of the river from opposite Kelfield village downstream to near Wistow Clough.

(2) Wistow Bank.

The construction of a new bank behind the existing one from a point near Wistow Landing to a point about 600 yards downstream therefrom.

(3) Long Drax Bank.

The reconstruction of the existing bank between the Ship Inn, Long Drax to Burr Wheel Reach.

(4) Riccall Ings Bank.

The reconstruction and strengthening of the left bank in Field No. 417, Riccall Parish.

(5) Hemingbrough Bank.

The reconstruction and strengthening of the left bank of the River Ouse between Hemingbrough Hope and Derwent Mouth.

(6) The reconstruction of weak portions of the left bank of the river fronting the Olympia Oil & Cake Company's property downstream from Selby.

The foregoing programme cannot be completed in its entirety during the remainder of the financial year, nor owing to the unknown increases in costs of materials and labour which may take place can reliance be placed upon any estimate now prepared, but care can be taken to ensure that the expenditure on these works does not exceed the unexpended balance on the funds available for the remainder of the financial year, namely, £46,598.

With regard to the practical cessation of progress in the Don Improvement Scheme, it must be realised that this will lead to a greater or lesser siltation of the lengths already completed.

To what extent this will take place will depend to a great extent on the length of time during which the works are stopped, and the weather conditions during the period of stoppage.

For example, a succession of dry years resulting in infrequent discharge of flood water down the river will result in much more rapid siltation than if floods are of frequent occurrence.

On the other hand, if the Don scheme is prosecuted vigorously, the reconstruction of river banks elsewhere will have to be postponed, with the resultant risk of breaches, the flooding of land and the destruction of food supplies.

The Committee's recommendations were subsequently confirmed by the whole Board and are now in course of execution.

Section I—ADMINISTRATION.

During the year under review the Catchment Board learned with deep sorrow of the death of one of their members in the person of County Councillor A. Corfield, J.P. who had represented the West Riding County Council on the Board since its formation. The services rendered to the Board by County Councillor Corfield were much appreciated and at their meeting in January, 1939, the Board by a standing vote tendered sympathy to his widow and the members of his family in their bereavement.

In his place the County Council appointed County Councillor A. R. Bailey to complete his term of office.

Death has also claimed Alderman George Smith, J.P., of Doncaster, who was a member of the Board for the period 1934-1937 and who has since served as a co-opted member on the Doncaster Area (Mining Provisions) Committee where his great local knowledge proved of considerable value to the Board. In this case also the Board conveyed to his widow their sympathy with her in her bereavement.

Alderman E. Cruikshanks was re-appointed Vice-Chairman of the Board.

NEW OFFICES.

As was foreshadowed in last year's Annual Report the project of providing suitable office and Board Room accommodation has been successfully carried out and the building was entered upon and occupied by the staff on the 1st August, 1939.

The Board were so fortunate as to secure the promise of the Minister of Agriculture and Fisheries, the Rt. Hon. Sir Reginald Dorman Smith, M.P., J.P., to perform the official Opening Ceremony on the 19th September, 1939. In view, however, of the declaration of a State of War, the ceremony has naturally been postponed.

It may not be, however, out of place to give some particulars of the site and building which have been supplied by the Board's Architect, Victor Bain, Esq., F.R.I.B.A.

"The site is admirably suitable for the purpose of offices. It is in a reasonably quiet locality with good light and air on all four sides of the island formation. The building line in St. Paul's Street was set back 7 feet at the request of the Leeds City Corporation, to conform to the requirements of the Street Improvement Scheme for the area in which the premises are situate, under the Town Planning Regulations, and the advantage of this action by the Corporation to the general amenities of the street, is now apparent. The main front of the building faces Park Square, which still retains most of the original Georgian houses. From the point of view of accessibility, the premises are remarkably well placed, being in close proximity to the Central and City Railway Stations, and to the Civic Centre and general business community.

"The design of the building is complementary in feeling to the traditional characteristics of its Georgian neighbours. It is four stories in height, standing approximately 40 feet above the surrounding pavement, and having one storey below the ground level. The elevational treatment of the facades is simple, reliance having been placed on balanced proportions, and on the materials employed. Ornament has been sparingly used, and when used, it is to be seen in the form of pictorial or emblematical representations, depicting the activities of the Board.

"The construction is fireproof, with steel framework encased in concrete, and concrete floors and staircases, and brick walls.

"The Main Entrance faces Park Square, and there are side entrances from Park Square East and St. Paul's Place."

A photograph of the Board Room taken by a Staff Photographer of the Yorkshire Post and Leeds Mercury is reproduced by the courtesy of the Proprietors on page 13.

The total area of the site upon which the offices stand is 1396 square yards and the Board were immediately faced with the position that a suitable office building erected thereon would provide more accommodation than they themselves immediately required. It was decided therefore to let the ground floor of the building for office purposes and they are glad to be able to report that they have secured as tenants for the whole of the ground floor and three rooms on the first floor, the Ministry of Transport, on whose behalf this accommodation has been taken by H.M. Office of Works.



Board Room, Park Square, Leeds.
(Reproduced by courtesy of Yorkshire Post and Leeds Mercury).

Within a few weeks, however, of the staff entering into possession, the Board were approached by the Leeds Food Control Committee who made an urgent request that the premises occupied by the Board should be let to them for the purposes of administering their important services during the state of emergency which had then arisen.

The Board took the view that having regard to the representations made to them they would be better serving the country by vacating the premises for such a purpose and themselves finding temporary accommodation outside Leeds at a convenient centre.

At a moment's notice, therefore, the staff vacated the premises and removed to Harrogate where a suitable house, No. 7, Langcliffe Avenue, has been rented from which the work of the Board is being carried on.

With a view to economising in the use of petrol and time a temporary office has also been secured in Lantern Tower Chambers, Coppergate, York, for the use of five members of the Engineer's staff who are resident in that city.

PARLIAMENTARY BILLS—SESSION 1938-39.

(a) **Mining Subsidence.**

During the Session a Bill to provide for the payment of compensation in certain cases for damage caused by mining subsidence was presented by a private member and was ordered by the House of Commons to be printed.

The Bill in the main followed the recommendations contained in the second and final Report of the Royal Commission on mining subsidence issued in 1927, which advocated the payment of compensation to private owners or occupiers of small houses having no right of support, or right of compensation for withdrawal of support. It was proposed to extend this principle to the payment of compensation for damage caused by subsidence to public buildings and public utility works of local authorities unless the local authority had any other power to proper compensation and provided that certain conditions were fulfilled.

Catchment Boards were included within the definition of "local authority" in the Bill but it was not clear that the definition of "public utility work" included works constructed or maintainable by Catchment Boards in connection with land drainage.

It therefore appeared to the Board that this was an opportunity not to be missed of endeavouring to secure the benefits of the Bill, should it be passed into law, for drainage works.

It will be remembered that in 1929 a special Act was passed known as the Doncaster Area Drainage Act, 1929, whereby an obligation was placed upon mineowners working or proposing to work minerals under lands situate within the Doncaster District to construct and maintain in proper condition such works and do such things as might by reason of any subsidence which resulted or might result from the working of the minerals be requisite, in order to obviate or remedy so far as having regard to all the circumstances of the case was reasonably necessary, any loss of efficiency which had arisen or might arise in the drainage system and drainage works of the Doncaster District, of which 330 square miles are situated in the Catchment Area.

The promoters were therefore approached and they agreed to accept an amendment whereby in effect drainage works outside the Doncaster District would secure the benefit of the Bill.

The Bill was afforded a second reading but owing to the exigencies of the situation the promoters were compelled to drop that portion of the Bill relating to compensation being payable in respect of public utility works.

The Board feel however that it is a matter for congratulation that a Bill dealing with this subject should have been afforded a second reading and that the promoters should have been willing to extend the benefits of the Bill to drainage works.

In the event of a similar Bill being introduced again the Board will keep a watchful eye thereon and again endeavour to secure what benefits they can in the interests of land drainage.

(b) Water Undertakings.

The Central Advisory Water Committee which was set up by the Ministry of Health included in their Second Report dealing with the Water Undertakings part of their reference the draft of a Water Undertakings Bill upon which the Minister of Health desired the observations of various bodies including the Catchment Boards' Association.

The object of the Bill was to consolidate with amendments certain enactments relating to water undertakings and the Board decided that in considering its proposals the correct attitude for them to adopt was to bear in mind the provisions of Section 1 of the Land Drainage Act, 1930, which places on every drainage authority (including Catchment Boards) a duty to exercise a general supervision over all matters relating to the drainage of land within its district.

The matter was dealt with by the Catchment Boards' Association as a whole who requested the observations of the several boards members of the Association.

On behalf of the Board the following observations were made :—

Subject Matter.	Observations.
<p>Clause 10 of the Bill authorised statutory water undertakers to make and carry into effect Agreements with the owners or occupiers of any lands within the catchment area of their water works with respect to the execution by any party to the Agreement of such works as the undertakers deemed necessary for the purpose of draining those lands or for more effectually collecting, conveying and preserving the purity of the water which the undertakers were authorised to take.</p>	<p>Catchment Boards to be consulted under this clause.</p>
<p>Clause 11 (" Power of Statutory Water Undertakers to acquire and hold lands and execute works for protection of water "). This clause included powers to lay and construct (inter alia) watercourses, catchpits and other works for various purposes.</p>	<p>Catchment Boards to be consulted.</p>

Subject Matter.	Observations.
<p>Clause 13 provided that the powers of the clause should not be exercised so as to damage or affect injuriously any "railways, docks or other works of a railway or dock authority or any works forming part of an inland navigation."</p>	<p>The words "or any main river, watercourse or drainage works" to be added.</p>
<p>First Schedule, Part II, Clause 3 ("Permissible limits of deviation") reads as follows:— "In the construction of any works authorised by the special Act the undertakers may deviate laterally to any extent not exceeding the limits of deviation shown on the deposited plans and, where on any street no such limits are shown, the boundaries of the street (including for this purpose any roadside waste forming part of or adjoining it) shall be deemed to be such limits and they may also deviate vertically from the levels shown on the deposited sections to any extent."</p>	<p>The words "except for the purpose of crossing a main river or watercourse" to be inserted before the word "deviate" in the third line and the words "except as aforesaid" to be inserted after the word "also" in the thirteenth line.</p>

All the above suggestions were adopted by the Catchment Boards' Association and along with various others suggested by other Boards were forwarded to the Ministry of Health. The Bill has been reported on by a Joint Committee of both Houses, but the Government have intimated that it will not proceed this Session.

A number of other Public Bills introduced into Parliament during the Session affecting Catchment Boards have been closely examined, including the Access to Mountains Bill, Civil Defence, Coast Protection, Highway Protection and Limitation Bills, and conferences with officials of the Government Departments concerned have resulted in clearing up many doubtful points.

AIR RAID PRECAUTIONS.

Considerable confusion existing as to the position of Catchment Boards in the matter of carrying out an Air Raid Precautions Scheme and receiving grant in respect thereof, during the Second Reading Debate on the Civil Defence Bill, the President of the Catchment Boards' Association explained to the House the position in which Catchment Boards found themselves and stressed the importance of providing adequate protection for works of land drainage.

In his reply on behalf of the Government the Lord Privy Seal stated that Catchment Boards were undoubtedly local authorities for the purposes of the Air Raid Precautions Act, 1937 and that it was open to them to formulate schemes and that the expense of any approved scheme after being apportioned among the various local authorities would be grant earning.

A scheme for the defence of the drainage interests in the Catchment Area was therefore prepared on behalf of the Catchment Board and submitted to the Home Office for approval.

The estimated cost of the scheme was £6,172 and the approval of the Home Office to such scheme has been received with the exception of two items therein upon which the Minister of Home Security is in consultation with the Ministers of Agriculture and Mines.

Section II.

INTERNAL DRAINAGE BOARDS AND DISTRICTS.

LOWLAND AREA.

The task which confronted the Catchment Board on its inauguration of bringing within the jurisdiction of Internal Drainage Boards such lands in the Catchment Area as would derive benefit or avoid danger from drainage operations has now been practically completed.

In all twenty-seven new Internal Drainage Districts have been formed and several others enlarged so that all that remains to complete this portion of their task is to deal with certain small areas which in most cases can best be dealt with by including them in Internal Drainage Districts.

CREATION OF NEW DISTRICTS.

Holbeck.

During the year the necessary steps were taken to complete the constitution of the Holbeck Internal Drainage Board which held its first meeting on the 2nd August, 1939, when the Board appointed Walter Dale, Esq., as their Chairman.

This latest district set up by the Catchment Board has a total acreage of about 530 acres in the parishes of Givendale, Bishop Monkton, Burton Leonard, Copgrove and Westwick, and drains into the River Ure.

Shipton-by-Beningbrough.

The Board have given instructions for a lowland area comprising roughly 15,000 acres lying between the River Kyle and the River Foss and draining into the River Ouse to be surveyed with a view to the establishment of an internal drainage district.

EXTENSIONS OF DRAINAGE DISTRICTS.

Dun.

The Catchment Board have now received the decision of the Ministry with regard to the proposals placed before them for the extension of the Dun Drainage District.

By the Scheme it was proposed to add to the District certain areas of land situated along the south-eastern and western boundaries of the district amounting in all to about 4,233 acres.

Twelve owners who between them owned 755 acres of these 4,233 acres lodged representations with the Ministry objecting to their lands being brought within the District.

The Minister accordingly ordered a Public Local Inquiry into the matter which lasted three days.

The principal objectors were Messrs. Pilkington Bros., the Corporation of Doncaster and the Doncaster Co-operative Society Limited.

The main ground of their objection were that no benefit would be received by them through the inclusion of their lands in the district and that in deciding whether the proposed lands would receive benefit or avoid danger from drainage operations the Ministry were not entitled to take into account drainage operations by the Catchment Board.

The Minister has now promulgated his decision to the effect that he was unable to make an Order as in his view the lands to which objection had been taken would not avoid danger or receive benefit from drainage operations within the meaning of Section 1 (5) of the Land Drainage Act, 1930.

BYELAWS.

The Board are glad to be able to report that it is becoming increasingly realised by internal drainage boards that the adoption of a set of Byelaws which the Minister is prepared to confirm under the Land Drainage Act materially assist them in the discharge of their duties.

During the year the following additional internal drainage boards have adopted sets of Byelaws which are now in operation :—

Cliffe.
Lower Aire.
Ouseburn.
Rye.
Selby Dam.
South Wharfe.
West Derwent.
Wistow, Cawood and Selby.

ELECTIONS.

All drainage boards formed under the Land Drainage Act or to which the provisions of the Act have been made applicable are required to hold a triennial election and this year elections have been held by the following boards :—

Acaster.	Rawcliffe.
Airmyn.	River Kyle.
Aldborough.	River Tutt.
Cowick.	Snaith.
Dearne and Dove.	Thornton.
Dempster.	Thorntree.
Dunsforth.	Upper Swale.
Gowdall.	Went.
Knottingley to Hensall.	West Haddlesey.
Lower Swale.	

GRANTS TO INTERNAL DRAINAGE BOARDS.

The Board were glad to receive intimation from the Minister that grants under Part III of the Agriculture Act 1937, to assist financially schemes of land drainage carried out by internal drainage boards for the purpose of improving land in need of proper drainage and thus increasing the productivity of the soil would be available during the Season 1939-40.

They were also glad to know that he had decided that some relaxation of the condition that work must be confined to the period 15th October to 30th April was to be permitted in the case of schemes consisting mainly of structural work and schemes carried out mainly by means of machinery so as to allow work on such schemes to continue until the 31st July.

In addition to the 43 schemes, approval of which was reported in last year's Report, approval to the following additional 41 schemes has been received during the year :—

Name of Drainage Board.	Description of Scheme	Estimated Cost .		Amount of Estimated Grant.
		£	s. d	
Acaster Internal Drainage Board.	Provision of new tidal flap valve.	47	0 0	50
Ainsty Internal Drainage Board.	Clearing drains at Moor Moncton and Bilton.	200	0 0	50
ditto.	Widening and piling Ainsty Beck.	150	0 0	33½
ditto.	Piling Broad Wath and Hole Beck.	80	10 0	50
Airmyn Internal Drainage Board.	New outlet to River Aire.	387	18 0	50
(Supplementary Estimate).		37	2 0	33½
Black Drain Drainage Board.	Piling Black Drain (Moorends near Thorne).	533	12 0	50
Cod Beck Internal Drainage Board.	Cleansing of Thacker Beck Topcliffe and Carlton Miniott,	59	12 6	33½
ditto.	Improvement of Broad Beck etc.	270	0 0	33½
Cliffe Internal Drainage Board.	Improvement of Cloughs.	3,711	17 6	50
		(approval increased to £4084 2 0).		
Cowick Internal Drainage Board.	Improvement of Carr Drain (E. and W. Cowick).	100	0 0	50
Dearne & Dove Internal Drainage Board.	Cleaning and re-grading River Dove.	495	0 0	33½
Dempster Internal Drainage Board.	Swang Drain Improvement.	153	0 0	33½
ditto.	ditto.	136	0 0	33½
Dun Drainage Commissioners	Airey Lane Drains Improvements (Thorpe-in-Balne)	376	7 7	33½
ditto.	New Cut and Out-fall, Bramwith	3,140	0 0	50
		3,330	0 0	33½

Name of Drainage Board.	Description of Scheme.	Estimated cost		Amount of Estimated Grant
		£	s. d	%
Dun Drainage Commissioners	Raising banks of Smallholme and Tilts Drain, purchase of Thorpe Marsh, etc.	1,187	0 0	50
		7,774	0 0	33½ plus 33½% of depreciation in value of land purchased.
ditto.	Rearrangement of Old Ea and Skellow Ings drains, etc.	3,318	0 0	50
		11,402	0 0	33½
Gowdall Drainage Board.	Construction of new outfall.	260	0 0	50
Lower Swale Internal Drainage Board.	Cleansing Pickhill Beck.	380	0 0	33½
ditto.	Cleansing Cundall Beck.	290	0 0	33½
ditto.	Cleaning main drains.	196	10 0	33½
ditto.	Replacement of Clough Doors.	32	15 0	33½
Marston Moor Internal Drainage Board.	Works at Rufforth, Hessay and Long Marston.	740	0 0	50
		260	0 0	33½
do.	Improvement of Bogs Middle Drain (Long Marston).	100	0 0	50
		150	0 0	33½
do.	Piling Hessay Cross Dyke.	165	0 0	50
Muston & Yedingham Drainage Board.	Underpinning bridges and drain work.	245	15 0	50
		335	17 9	33½
Ouseburn Internal Drainage Board.	Clearing and sludging Pool Beck, etc.	200	0 0	33½
River Foss Internal Drainage Board.	Improvement of watercourses. Lilling, nr. York.	70	0 0	33½

Name of Drainage Board.	Description of Scheme.	Estimated cost.	Amount of Estimated Grant
River Foss Internal Drainage Board.	Further improvement of River Foss from Haxby to Strensall Lock House.	1,750 0 0	% 33½
River Kyle Internal Drainage Board.	Piling banks of Sun Beck New Parks Beck and High Carr Drain.	240 0 0	50
ditto.	Clearing and sludging drains.	500 0 0	33½
River Wiske Internal Drainage Board.	Piling stells near Northallerton (Supplementary Estimate).	70 0 0	50
ditto.	Improvement of Cowton Stell, nr. Northallerton	140 0 0	33½
Rye Internal Drainage Board.	Piling toe of flood banks of River Seven, Normanby.	180 0 0	33½
ditto.	Clearing Black Sike and Low Bottoms Drain.	75 0 0	33½
ditto.	Widening, regrading and piling banks of Costa Beck.	500 0 0 2,600 0 0	50 33½
Selby Dam Drainage Commissioners	Piling Selby Dam Outfall.	833 19 6	50
ditto.	Driving sheet piling in bank of Bishop Dyke, Sherburn-in-Elmet.	91 17 2	50
Upper Swale Internal Drainage Board.	Kirkby Fleetham Drainage improvement.	230 0 0	33½
Went Internal Drainage Board.	Rebuilding culverts and regrading and widening drains.	755 0 0	33½
ditto.	Reconditioning internal drains.	240 0 0 1,350 0 0	50 33½

In addition to the foregoing schemes notifications have been received from the Ministry of applications for approval of 15 further schemes as follows :—

Name of Authority.	Description of Scheme.	Estimated Cost. £
Ainsty Internal Drainage Board.	Clearing and Sludging Great Gutter.	380
Cod Beck Internal Drainage Board.	Cleansing of main drains.	75
Dearne & Dove Internal Drainage Board.	Clearing and regrading River Dove and North Dyke.	495
Dun Drainage Commissioners.	Installation of Pumping station Bentley Ings.	27,000
ditto.	Reconstruction of Drain.	642
Lower Swale Internal Drainage Board.	General cleansing of main drains.	165
Ouseburn Internal Drainage Board.	Main drain improvement scheme at Nun Monkton, and Thorpe Underwoods.	200
Rawcliffe Drainage Board.	Laying concrete tubes and providing cast iron flap to outlet. Rebuild wing walls to Pasture Clough.	300
River Foss Internal Drainage Board.	Clearing and Sludging River Foss.	230
River Kyle Internal Drainage Board.	Main Drains Improvement Scheme.	500
River Wiske Internal Drainage Board.	Cleaning and Sludging in Brompton, Smeaton and Cowton Area.	230
Thorntree Drainage Board.	Construction of pump house and well, installation of pump Rawcliffe Bridge.	1,700
ditto.	Widening and regrading Thorntree Drain, Johnny Moor Long Drain and Railway Delph.	500
Went Internal Drainage Board.	Reconditioning internal drains.	1,590
West Derwent Internal Drainage Board.	Reconstruction of cloughs.	1,443

DIFFERENTIAL RATING.

It is provided by Section 24 (6) of the Land Drainage Act that a drainage board after consultation in the case of an internal drainage board with the Catchment Board may if, having regard to all the circumstances of the case they think it is just to do so make and levy differential rates and may for that purpose divide the district into sub-districts and determine what the rate shall be in each district.

The following boards have consulted the Catchment Board on this matter during the year :—

(a) **Hatfield Chase Corporation.**

Most of the area administered by the Hatfield Chase Corporation is situated within the River Trent Catchment Area. There is however an area of 871 acres within the River Ouse (Yorks.) Catchment Area.

Several attempts have been made by the Corporation to devise an equitable system of rating and from time to time the position is reviewed.

By their latest Order the Corporation proposed to provide that in the case of the unrated sub-district (in which was included the portion of the whole area within the Ouse Catchment Area) the proportion of rates they should pay compared with the other portions of the Drainage District should be slightly increased.

The Catchment Board decided to make no observations on the proposed Order.

(b) **Lower Swale Internal Drainage Board.**

It was mentioned in the last Annual Report that the Catchment Board felt they could not support the proposal of the Lower Swale Internal Drainage Board to rate differentially their district and they were accordingly glad to receive later a communication from the Board that they had decided to adopt a flat rate throughout the whole district.

CONFERENCE AND INSPECTION OF WORKS.

The Annual Conference with Internal Drainage Boards which had been arranged to take place on October 11th had perforce to be cancelled in view of the State of Emergency which had arisen, involving as it did difficulties of transport.

For the same reason the arrangements made for the Annual Inspection of Internal Drainage Board's works were also cancelled.

SUPERVISION OF INTERNAL DRAINAGE BOARDS.

Internal drainage boards have continued to take advantage of the services of the Catchment Board on both engineering and legal matters.

During the year covered by this Report three engineering assistants have been exclusively employed on work for the internal drainage boards. Most of the time of these assistants has been spent in preparing and supervising improvement schemes and also advising on the organisation of annual maintenance work.

The following is a brief description of special engineering work carried out by Catchment Board officials. It must be appreciated, however, that in addition to the work described ordinary supervision, investigation of complaints, tabulation or returns, etc., are carried out by the Catchment Board staff.

Acaster Drainage Board.

The scheme for the installation of a new cast iron flap valve for Church Ings Clough at Acaster Malbis has been prepared. Work on the scheme has been commenced.

Ainsty Drainage Board.

Schemes involving the piling of three watercourses in this district have been prepared, the work being carried out during the Summer months. Further improvement schemes for this district have been prepared involving the improvement of six other watercourses. It is the intention of the Drainage Board to carry out these schemes during the Winter months.

Dearne & Dove Drainage Board.

Improvement schemes were prepared for this Board and the carrying out of the work supervised. These schemes included the clearing and regrading of Ings Dyke, Highgate Lane Dyke, and Small Bridge Dyke, resulting in the better drainage of a considerable area previously swamp or submerged land.

An improvement scheme has now been prepared for the River Dove and North Dyke, which is to be carried out in the near future.

Holbeck Drainage Board.

The above Board is the most recently constituted in the Catchment Area and at its first meeting the Catchment Board was requested to prepare an improvement scheme for the



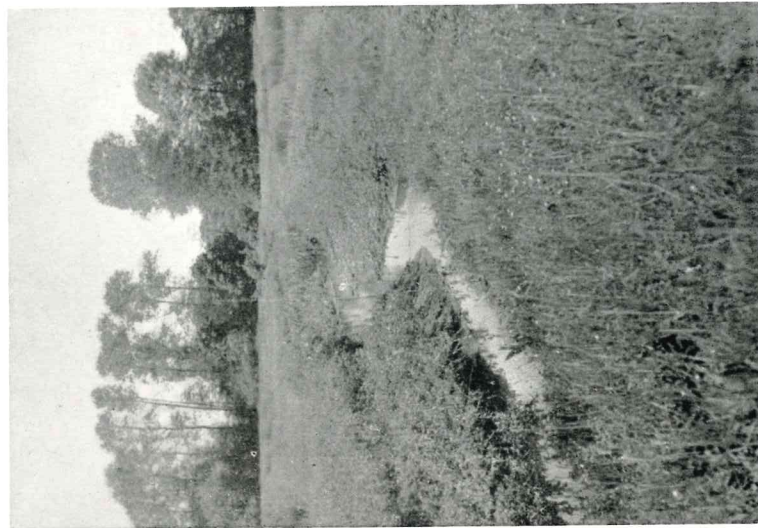
**Foss Internal Drainage District. River Foss.
Work in progress above Towthorpe Bridge.**



Improvement completed.



After improvement.



Lower Swale Internal Drainage District.
Pickhill Beck before improvement.

whole of the main drains in the district. This comprehensive scheme has been prepared by the Catchment Board and it is hoped that the Drainage Board will adopt the scheme and commence work within the course of the next few months.

Marston Moor Drainage Board.

Improvement schemes have been prepared for two important watercourses in this district involving regrading and piling. It is the intention of the Drainage Board to carry out these schemes during the Winter months.

Ouseburn Drainage Board.

Improvement schemes have been prepared for three main drains in this district. This work is at present in progress.

River Foss Drainage Board.

As was stated in last year's Annual Report the above Board were carrying out an improvement scheme on the River Foss estimated to cost £6,000. Progress on this scheme has been most satisfactory and the excavator work on the main channel has now been completed with great benefit to the adjoining land during flood periods. Photographs of the work appear on page 29.

A certain amount of work involving the spreading of the excavated spoil still remains to be done.

River Kyle Drainage Board.

This district is comparatively new, having been recently extended from 2,000 acres to approximately 20,000 acres.

A comprehensive improvement scheme was carried out during the winter 1938-39 involving 54 miles of main drain. During the summer months piling schemes were carried out on three main drains. A further improvement scheme has been prepared for this Board involving the improvement of approximately twenty miles of main drains. This scheme has been commenced and work is continuing satisfactorily.

Muston & Yedingham Drainage Board.

Under the direction of their own Surveyor, Mr. W. P. Holgreaves, the above Board have carried out improvement schemes involving the deepening and regrading of the River Derwent for a length of 178 chains, also 137 chains in the Sherburn Cut and 126 chains in the main outfall drains, have been dealt with in a similar manner.

An excavator hired from the Catchment Board was employed in carrying out these schemes.

Went Drainage Board.

The following report has been submitted by C. E. Farran, Esq., M.Inst.C.E., Engineer to the Went Drainage Board.

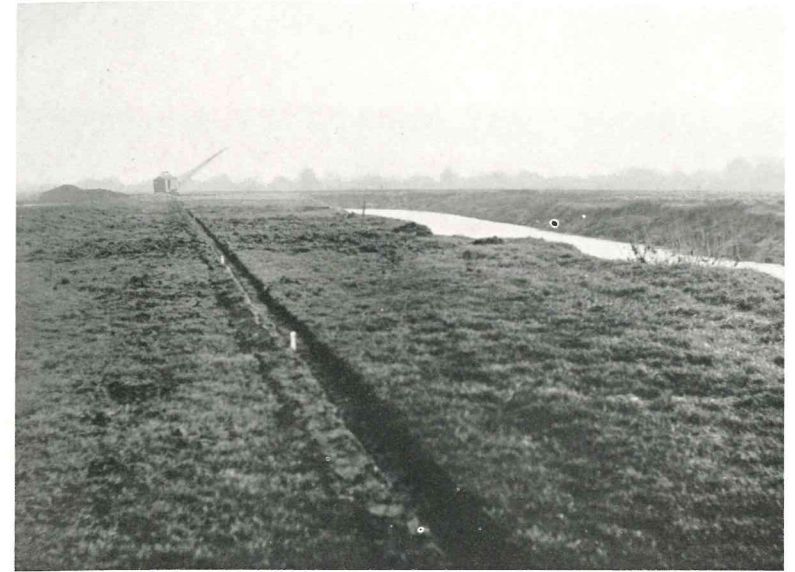
“The Went Drainage Board as reconstituted took up its duties in October of 1938 and at once proceeded to get out a new assessment list and rate book. Owing to the foresight of the Board's predecessors, the Went Trustees, a considerable part of the ground work had been done with a result that the first demand for rates went out in March, 1939. Despite the fact that the majority of the ratepayers had not in the past ever received a demand note, the rates were paid promptly with a result that the new Board were able at once to embark on works for the reconstruction of a number of drains in the extended area. The Ministry of Agriculture's grant was obtained and 472 chains of drain were cleaned out during the grant earning season ending 30th April, 1939.”

Section III—MAIN RIVERS AND WORKS.

MAIN RIVER SYSTEM.

The “main river” of the Catchment Area as shown on the official map of the area is now as follows :—

River.	From	To confluence with	Length Miles	Water-shed Area Sq. Miles
Derwent	Yedingham Bridge	Ouse	50½	757
Rye	River Riccall	Derwent	11½	
Sea Cut	Weirhead	North Sea	5	12
Swale	Catterick Bridge	Ouse	40½	569
Ure	Wensley	Swale	44	383
Nidd	Pateley Bridge	Ouse	43	254
Wharfe	Bolton Bridge	Ouse	48	408
Aire	Ingha Bridge	Ouse	77	506
Calder	Todmorden	Aire	47½	361
Don and Dutch River	Wadsley Bridge	Ouse	45½	714
Dearne	Darton	Don	21½	
Rother	Chesterfield	Don	23½	235
Ouse	Swale and Ure	Trent	56	
			513½	4,199

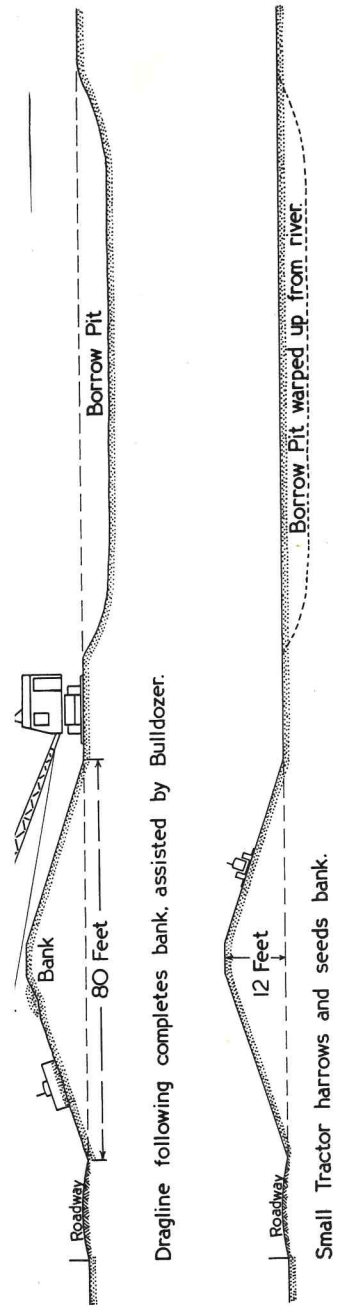


River Don.

No. 6 Excavator widening and easing bend. First operation.

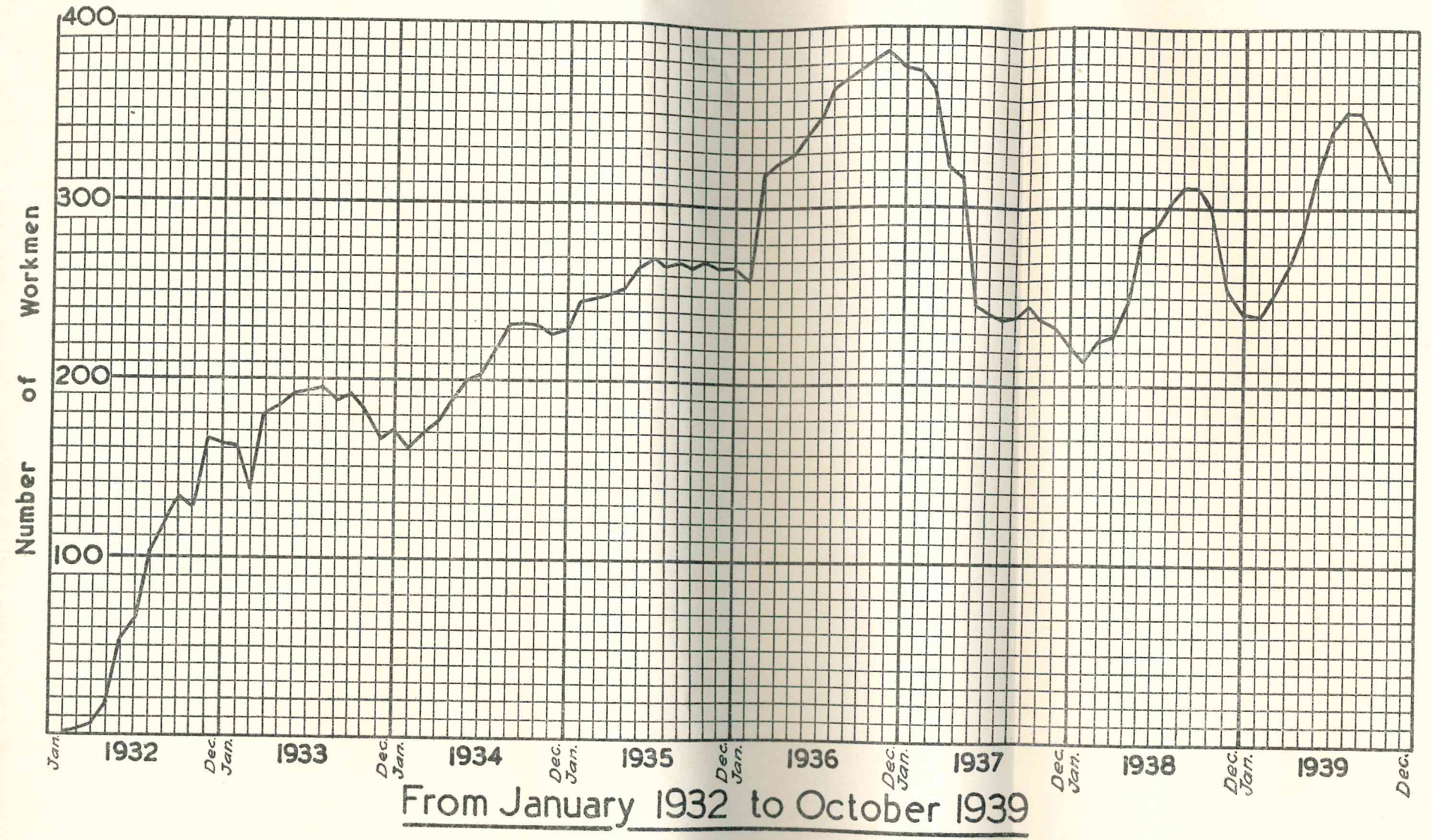


Subsequent operation.



Dragline following completes bank, assisted by Bulldozer.
 Small Tractor harrows and seeds bank.
 River Don. Stainforth Ings Embankment.
 Diagram of operations of Bulldozer, Scraper and Excavator.

DIAGRAM SHOWING NUMBERS OF MEN EMPLOYED



WORKS — GENERAL.

The main river works carried out by the Board during the year are dealt with under two main headings :—

- (a) New Works and Improvement of Existing Works.
- (b) Works of Maintenance.

Generally speaking the progress made with all works during the year had been satisfactory—the weather conditions being favourable.

Throughout the year the cost of materials and plant has remained high and there has been no reduction in wages paid to the staff.

As was stated in last year's report, the volume of work which can now be carried out for any given sum is materially less than when the original estimates were framed some years ago when the costs of materials, plant and labour were about 25 per cent lower than they are to-day.

Throughout the year there has been a scarcity of suitable labour, particularly in the engineering trades and this problem has become acute since the declaration of war.

Difficulty is also being experienced in obtaining supplies of materials such as steel, timber and cement and this leads to delay in the execution of schemes.

The more important schemes carried out during the year are briefly detailed in the following pages :—

NEW WORKS AND WORKS OF IMPROVEMENT.

(1) RIVER DON (Lower Section) and DUTCH RIVER.

The carrying out of the above scheme has been proceeded with steadily and continuously throughout the year. As mentioned in previous reports the primary object of the scheme is to prevent entirely the overflow of the river between Doncaster and Goole, particularly into the subsided area in and around Bentley, and also, by the reconstruction and strengthening of the river embankments, to minimise the risk of flood and tidal breaches. In order to prevent overflow of the river it was decided to increase the capacity of the River Don to such an extent that the river will be capable of discharging a flood flow amounting to 12,000 cubic feet per second, compared with the original capacity of 5,000 feet per second. This increase in discharge capacity of about two and half times is being effected mainly by river widening, easing of bends, removal of obstructions and by the raising of the flood embankments.

(a) River Widening.

The widening of the River Don and Dutch River has been practically completed to a point about a mile downstream of Fishlake. The work is carried out by long radius dragline excavators, equipped with 60-foot jibs. In spite of this out-reach the amount of material excavated during the course of widening is frequently so large that two or more cuts have to be made and the excavated material rehandled back in order to clear the site for the second cut. The work is illustrated in the photograph on page 33 which shows No. 6 Excavator widening the river and easing the bend below Fishlake.

Since the commencement of the scheme 700,000 tons of material have been removed from the river channel and the whole of the material used to form the new flood embankments.

(b) Construction of New Flood Embankments.

One of the major difficulties in the construction of the flood embankments was the shortage of material available, as the quantity above referred to was quite insufficient owing to the low level of the land, to complete the new embankments. Moreover, as a large part of the material was obtained from the easing of bends, its distribution was irregular and the major portion of the material had to be rehandled and transported sometimes considerable distances to the site of the new banks. This transport is carried out normally by tip wagons hauled by diesel locomotives. Where sufficient material is not available from the channel widening, additional material is obtained from suitable spoil pits and transported by similar means, where it is spread by hand and consolidated by power rammers. The embankment is then sown down with grass seed.

The following are examples of this class of work carried out during the year :—

(c) Dutch River Embankment near Decoy Farm.

The south bank of the Dutch River between Decoy Farm and Goole Railway Bridge was extremely porous and many leakages were taking place due to its inadequate dimension and the poor quality of the material of which it was formed. As a breach in this embankment would cause considerable damage over a very large area it was decided to reconstruct the bank over the entire length.

No. 4 Excavator was first employed on the completion of the widening of the Dutch River in order to obtain as much material as possible from this source. The excavated material was deposited on the foreshore and left to dry out. When sufficiently dry the same machine loaded the material into tip wagons which were hauled by diesel locomotives to the section to be dealt with. Further material will then be obtained from a central spoil pit to be dug in an adjacent field. Ancillary works along this length include a concrete retaining wall, where neighbouring property restricted the width available for the bank, and the reconstruction of Decoy Clough Outfall.

(d) Reconstruction of Decoy Clough.

Built many years ago this clough and more particularly the doors had fallen into a bad state of disrepair.

The clough was originally constructed for warping purposes and was provided with pointing doors, but these have been closed for some considerable time and a timber flume extension equipped with a tidal flap had been built into one of the doors.

When the excavation had been carried down to cill level it was discovered that the whole of the structure had been erected on an oak raft, which, although changed in colour to a shade between black and indigo, was found to be sound in every way. Similarly the masonry arch of the culvert showed no sign of the least movement except for some slight subsidence on the face.

When it is realised that works of this nature were undertaken before the advent of Portland cement and steel piling one is bound to admire the care and skill of these early engineers.

The present timber flume or chute is being removed and replaced by centrifugally spun concrete tubes laid on reinforced concrete and terminating in a tidal flap with stainless steel hinges.

The lowest portion of the reinforced concrete apron necessitates for its construction a box of steel sheet piling, since the outfall of the reconstructed clough will be considerably further out into the stream than the outlet of the previous timber culvert, and therefore at a much lower discharge level, and on account of tidal water, more difficult to construct.

The advantage of having the point of discharge projected well into the stream is that adjacent banks are not eroded by water flowing from the land and this is one of the reasons for the reconstruction.

(e) River Don Embankment, left bank New Bridge to Jubilee Bridge.

During the year good progress has been made in completing the river embankments between New Bridge and Jubilee Bridge. Only two lengths, both of which are now being constructed, remain unfinished. The right bank is completed to within 800 yards of Jubilee Bridge, whilst there is a length of three quarters of a mile on the left bank not yet finished near that part of Cowick Road which is to be diverted. The road at this point is situated on top of the old flood bank for 1,000 feet, which had a tendency to slip into the river. This has been prevented by the construction of a stone wall at the toe a few years ago by the board. A new flood bank is to be constructed and the road placed behind it.

The left bank apart from the above length was completed as far as Ivy House a year ago. This year the bank has been finished as far as Jubilee Bridge. This length was a very difficult one due to the great shortage of material previously mentioned. The material was chiefly obtained from widening the river upstream of Jubilee Bridge by No. 7 Excavator, and transported in tip wagons downstream. It was deposited along the length of the embankment and allowed to dry out. Even after moving 40,000 tons in this way there was still a total shortage of 20,000 tons. This occurred between Ivy House and Blackshaw Clough for a distance of 800 yards, and between Steward's Ings Lane and Jubilee Bridge for a distance of 200 yards.

The first length was completed by No. 1 Excavator using material from two spoil pits and distributing it with locomotives and tip wagons. The spoil pits were used when the new embankments could be set back from the river, and there was sufficient width of foreshore for a pit to be dug. When all the material needed had been removed the river was allowed to overflow into the pits, and they commenced to warp up.

Before the excavator completed the embankment from the spoil pits, it travelled along the top of the spoil heaps, which had now had time to dry, forming as much of the bank from the base upwards as the quantity of material would allow. All freshly tipped material was consolidated by powers rammers and the embankment finally trimmed and sown with grass. Behind the embankment a twelve-foot cart road was constructed in place of the existing one on top of the old flood bank. The bulldozer also helped in forming the base of parts of the embankment.

In the Spring of this year No. 12 Excavator commenced forming the embankment from spoil heaps 200 yards downstream of Steward's Ings Lane. Any surplus material was removed in tip wagons to parts of the embankment which were short. In this way the bank to Blackshaw Clough was finished.

Using the wide foreshore just downstream of Steward's Ings Lane as a spoil pit the length to Jubilee Bridge was completed by No. 12 Excavator and tip wagons. The old cinder road on top of the flood bank was first removed by the excavator, replaced with good material, and then the new embankment was constructed behind it.

To complete this one and quarter miles of embankment about 120,000 tons of material were required. One half of this amount was obtained from widening the river, 40,000 tons were obtained by easing the bend above Jubilee Bridge and the remaining 20,000 tons came from spoil pits.

(f) River Don Right Bank, New Bridge to Jubilee Bridge.

Before being transferred to the Dutch River, No. 4 Excavator was engaged on the construction of the new right embankment below Jubilee Bridge and continued work as far as "The Elms." The material was again obtained from a spoil pit and transported to the site in tip wagons.

The work is now being completed by No. 12 Excavator, which having finished work on the left embankment was moved across the river on the Ferry Pontoon. It is now forming the back of the embankment between "The Elms" and Jubilee Bridge from material obtained from widening the river last year.

The two Caterpillar Tractors and Le Tourneau Scrapers were also moved by Ferry Pontoon across the river to put into position the base of the new embankment, just upstream of the spoil heap. They are now obtaining spoil by skimming the surface of the field adjacent, as there was no river widening to provide material at this point.

The last 300 yards of river widening between New Bridge and Jubilee Bridge, i.e. on the right bank just downstream of the latter bridge, is now being carried out by No. 7 Excavator. The material is being deposited on the banks and left to dry out before being formed into the new embankment.

(g) River Don, right embankment, Stainforth East Ings.

The new embankment is in this case being set back a considerable distance from the main channel. Owing to the proximity of the existing embankment to the river edge it was not possible to carry out the river widening without cutting through the embankment. It was necessary therefore to construct the new embankment before the river widening was carried out, the whole of the material required having to be obtained from a spoil pit situated between the old and new banks. It was also necessary first to divert an existing right of way on the top of the embankment to the back of the new bank. The method employed in the construction of this bank is shown diagrammatically on page 34 and consists of the following operations :—

(1) A 40 h.p. Tractor operating a bulldozer removes the turf from the site of the new bank in order to form a key or bond for the new bank.

(2) Self-loading wheeled scrapers excavate and transport material from the far side of the spoil pit to form roughly the new bank.

(3) A long radius dragline excavator continues the excavation of the spoil pit and separates the material into clay and soil, the former being used to finish the embankment to shape and the covering of soil being then added. The 40 h.p. Tractor also assists in shaping and consolidating processes.

(4) A small tractor harrows and seeds the bank.

It should be mentioned that as the major portion of the work was carried out by the scrapers, they were placed on double shift whilst the excavator and bulldozer worked single shift.

The method used in the construction of this bank is of particular interest because each machine is utilised on work for which it is most suited, and as a result the work was quickly and economically carried out with a minimum of hand labour.



**River Don.
Forming new embankment.**



Forming new embankment. A further operation.



River Don.
Stone deposited to form training wall at bend.



Deposited stone covered with warp.

Although in the first section, now nearly completed, it was necessary to excavate and transport 45,000 cubic yards of material, only two labourers were employed. By proper arrangement of the work it was not difficult to ensure that each layer of material deposited on the bank was travelled over and consolidated by the succeeding scraper. Briefly therefore, it is considered that where this method can be adopted an excellent bank can be constructed in the most economical manner since—

- (1) All material is obtained from the nearest point and placed in position by the machine most adapted for the purpose.
- (2) All double handling is avoided.
- (3) Hand labour is practically eliminated.

So far as is known this method has not previously been employed in this country. The work in progress is shewn on page 41.

(h) River Training Works.
Bend at Jubilee Bridge.

As previously mentioned the easing of the bend above Jubilee Bridge was commenced last year and the excavation was completed last Autumn. A training wall was then constructed on the opposite or right bank by the deposit of cliff stone to form a footing to the new bank. Broken bricks were then placed behind the stone by No. 7 Excavator in such a manner as to ensure a rapid accumulation of warp. The various stages of this work are shown in the photographs on page 42. When the material has dried out and consolidated the new flood embankment will be constructed thereon.

(i) Dutch River.

In order to check erosion and consolidate the flood embankment it was decided to protect with stone the right bank of the river near Swang Clough. The material was brought by lorry to the left bank of the river where it was discharged by means of a chute into one of the Board's barges. The barges were unloaded at the site by the grab dredger and the material packed by hand into position. Broken bricks were then placed on top of the stone to complete the bank. Photographs on page 45 show the work in progress.

Further cargoes of stone have also been deposited preparatory to strengthening the right bank of the river above Rawcliffe Bridge.

(j) **Diversion of River at Thorne Waterside.**

The bulk excavation of this new cut was carried out last year but it was necessary to transport the material to the sites of the new flood embankments. The work was carried out by tractors and scrapers. Cradge banks were formed alongside the diversion, and the intervening land which is to be the berm or winter flood channel, was graded down to centre drains. These drains will discharge by means of culverts and sluices into the new course of the river. The construction of these sluices has now been completed.

(2) **RIVER DON (Upper Section).**

Rotherham Piling.

The piling of the left bank of the River Don below Grafton Bridge at Rotherham Corporation Tramway Shed was commenced in April, 1938, and by November a length of 400 feet had been completed. The completed work consists of a retaining wall of steel sheet piling and the total length was approximately 750 feet.

The main wall consisted of No. 2 G.B. Larssen Steel sheet piles 27 ft. 3 ins. long driven to a level of 77.25 above O.D. On an average this required that the piles should be driven about half their length. The main wall was secured to anchorages by means of two and three inch diameter rods, which varied in length between 35 ft. x 20 ft. determined by conditions, while the anchorages consisted of the piles driven together and strengthened with a short length of pile for a waling. There were, however, nine anchorages where the tram sheds were only 20 ft. from the piling, and here the wall of a pit inside the tram sheds was used as an anchorage block.

All the piles were driven by means of a double acting steam hammer operated by a two-ton steam derrick crane mounted on three rail bogies. Owing to the limitation of space on the site the crane was carried on a temporary staging of 12 ins. x 12 ins. timber piles which were driven and withdrawn in bays as the work progressed. The necessity of this temporary staging, which had to be driven with the steam hammer, retarded the progress and a maximum of 10 piles were driven under the most favourable conditions.

The last 300 feet of the work was probably the most difficult owing to the fact that space was very restricted between the main Rotherham-Rawmarsh road and overhead telephone and high voltage electric wires came very close to the work and in some cases were immediately above the anchorage. A third difficulty arose as it was now mid Winter, and flood water in the river raised the water level considerably, and so it was necessary to strengthen the staging as a precaution.



Dutch River.
Swang Clough. Erosion of bank behind piling.



Stone deposited behind piling.



River Don.

As the piling was completed a small gang constructed a reinforced concrete cope on the top of the piling. All the shuttering for this coping was fabricated at the Board's workshop, at Thorne, and was of a special design to enable it to be used a number of times and by unskilled labour.

As the work was completed all the exposed steelwork was coated with a hot solution of dehydrated horizontal retort tar containing a small percentage of slaked lime as a protection against corrosion. This solution had been tested over a period of years by a Committee of the Institution of Civil Engineers and found satisfactory.

Finally the whole site was backfilled to the level of the coping and the entire work, in which 320 tons of steel and 160 tons of concrete were used, was completed in June, 1939. The completed work is shown on page 46.

(3) RIVER DERWENT.

(a) Stamford Bridge Lock.

Though no longer used for navigation, repairs as a means of accelerating the discharge of flood waters, were carried out at Stamford Bridge Lock. Being in a serious state of decay the timber lock gates were removed and the upstream gates were replaced by a vertical lift steel gate. Messrs. Horsley Bridge & Thomas Piggott Ltd., supplied and erected the gate which is the second of a similar type to be installed on the river—the first being at Elvington in 1936.

Prior to commencing operations, it was essential to isolate the lock from the river in order that work might be carried out under dry conditions. This was achieved by the driving of two temporary steel piled coffer dams, one upstream and one downstream from the lock. In the upper gate chamber the old masonry side walls were demolished, the timber cill and floor removed, and the whole reconstructed in reinforced concrete. On clearing out the lock floor, the masonry side walls which were in good condition, were found to have been built on a sandstone rock foundation, but unfortunately portions of the lock floor had been badly scoured away, one large hole being seven feet deep. A new reinforced concrete lock floor was laid down and numerous cavities in the downstream approach channel to the lock were filled with concrete. Large areas of the channel walls were "raked out" and repointed and one weak portion was rebuilt.

The outbreak of war found work on the reconstruction of the lock practically completed, but the dredging of the lock cut, which at present is almost completely silted up, had not commenced.

It is hoped that the removal of the silt in the lock cut will be completed early in 1940 when the additional area of the channel will undoubtedly facilitate the discharge of flood water and alleviate local flooding. Photographs of the work taken during construction are shown on page 49.

(b) Elvington Fishpass.

After a delay of three months, caused by continuous flood conditions in the River Derwent during the winter, the fish pass was opened in July, 1939.

Constructed in reinforced concrete, this structure, photographs of which are shown on page 50, embodies the latest design in fishpass construction. Set between two parallel retaining walls, fourteen pools, each interconnected by streamlined openings, provide for the easy passage of fish. With an 8½ inches difference in level between each pool, the fishpass, 76 feet long by 21 feet wide, gives a height 9 ft. in. between the upper and lower levels at low water.

The passage of pedestrians across the fishpass is provided for at each end by footbridges constructed as reinforced concrete arches.

(c) Channel Improvement.

Excavators No. 8 and No. 3 have continued to work on the River Derwent Channel Improvement Scheme.

After delays in the early part of the year, due to extensive repairs and prolonged flood periods, the machines have given a good performance. Working mainly in the Parish of Wheldrake and Thorganby, No. 3 machine, operating on the right bank, has widened and deepened 840 yards of the existing channel, while No. 8 Excavator has been similarly employed for six months on 533 yards of the opposite bank.

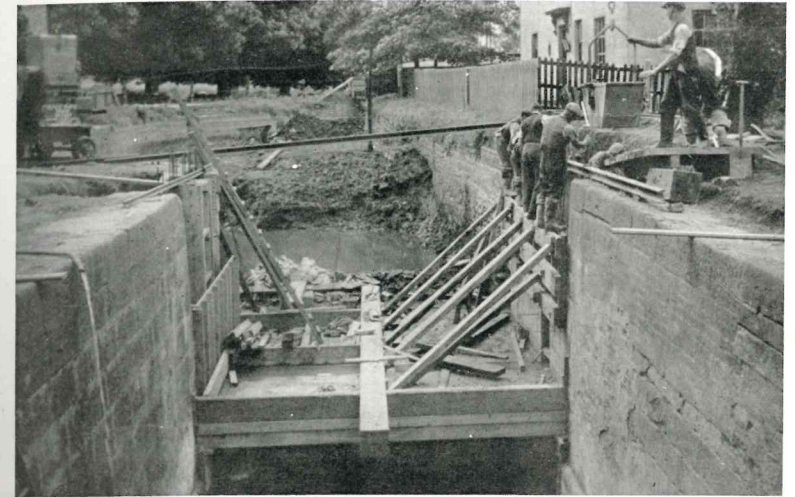
Between Elvington Cut and Cottingwith Ferry, on the easing of a few acute bends and the widening of short lengths of the channel, the scheme for the tidal portion of the river will be completed.

(d) Bank Improvement.

During the past two years the continuous subsidence of the bank at Barmby-on-the-Marsh has given considerable cause for anxiety and necessitated heavy maintenance work.

It was decided therefore that a portion of the bank 60 yards in length, should be set back from the river and reconstructed. After protracted and difficult negotiation for the purchase of the land, work commenced on the 17th May, 1939.

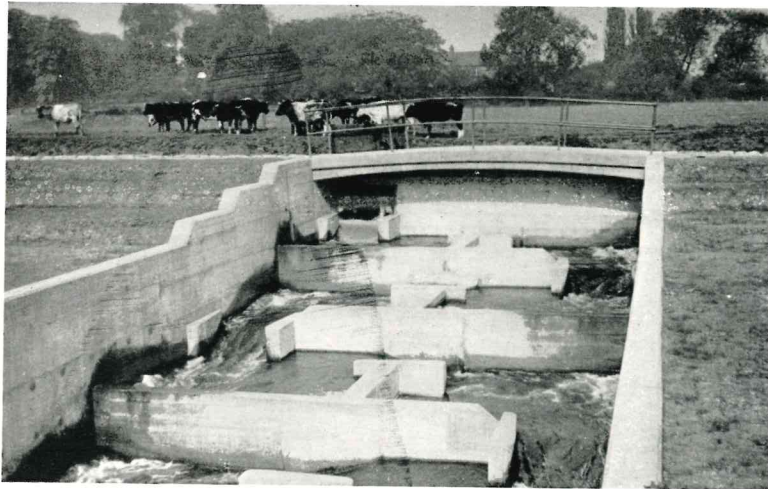
The close proximity of the old and new banks enabled No. 8 Excavator to work without the aid of track and wagon.



**River Derwent.
Stamford Bridge Lock Sluice during construction.**



Sluice erected.



River Derwent—Elvington.
Fish pass.



River Derwent—Elvington.
Automatic Sluice Gates and Fish Pass.

the removal and formation of the banks being carried out in one operation and during periods of high tides the gap between the banks was closed by means of a temporary cross bank.

Thoroughly consolidated by means of power rammers, the bank was built on land from which all vegetation was removed and to ensure bonding of the bank with the ground, a longitudinal key trench was also cut along the total length of the new formation. This key trench, about five feet deep, also served to disclose the presence of any agricultural tile drains which might otherwise have been left under the new bank.

At Fleet Dyke, where the position of the bank was adjacent to existing property, it was not possible to form the bank to the full width and a reinforced concrete retaining wall 41 feet in length and 5 feet high, was therefore constructed.

As a result of setting back the bank at Fleet Dyke, a new clough consisting of 15 in. diameter concrete pipes, was substituted for the existing timber clough which was removed.

It is hoped that the construction of a stone retaining wall on the foreshore will arrest any further movement of the new bank. So far, stone has been delivered and placed in position in front of 100 yards of new bank, the deposit of the stone being preceded by the excavation of a key trench.

At the commencement of hostilities, two-thirds of the scheme was completed and as the bank will afford protection to valuable agricultural land, the work will continue.

(4) RIVER OUSE.

(a) General Description of Scheme.

Steady progress has been maintained throughout the year on the high tidal embankments between Wharfe's Mouth and Trent Falls, which protect from flooding the valuable agricultural land behind.

Where existing flood banks are situated close to the river edge on unstable foundations, new banks are being built behind. In other cases where circumstances permit, existing banks are being strengthened by protecting the river face and raising and widening the bank on the land side.

The construction of new banks follows the same lines as that described and carried out in past years.

(b) Progress of Works.

The following schedule summarises the progress of improvement works on the River Ouse during the past year :—

Site of Work.	Nature of Works.	Length dealt with 1938-39.	Site of Work.	Nature of Works	Length dealt with 1938-39.
On right bank at Fareswell, Cawood.	Reconstruction of flood bank average height 12 ft. with 6 ft. wide crest. Excavator No. 5 excavated soil from the river's edge which was either placed direct on the existing bank or transported by wagons on light railway track. 400 tons of stone and rubble were placed in position in Field No. 309 Cawood Parish to form a protective toe to an eroded portion of bank. Two rows of willows have been planted over one mile length of foreshore to encourage siltation and replace felled trees.	7 chains.	On right bank at Long Drax, between West End of Long Drax village and field above Ouse Railway Bridge, Barmby.	cavator No. 11 and loaded into tip wagons, hauled by diesel loco. to the bank. Construction of new flood bank of an average height of 5 ft. with a crest width of 4 ft. Soil was excavated from the main arterial drain near Corner Farm, and the foreshore of field No. 110, Long Drax Parish. Excavator No. 16 loaded into tip wagons which were hauled to the site by diesel locomotive.	25 chains.
On right bank opposite Wheel Hall.	Construction of new flood embankment to a height of 13 ft. to ease bend in field No. 298, Cawood Parish. Soil was excavated from spoil pit in Field Nos. 299 and 298 same parish. Excavator No. 5 was used for digging soil and loading tip wagons. Haulage was effected by diesel locomotive.	7 chains.	On right bank field Nos. 103 and 109 Long Drax Parish.	Reconstruction of flood bank, average height 5 ft. width 6 ft. wide crest. Spoil excavated from foreshore and loaded into tip wagons by Excavator No. 16.	22 chains.
On right bank at Wistow, opposite Turn Head.	Fascine work protection was laid along weak length of bank by the insertion of a seven course layer of kids. The material was transported to the site in the Board's craft from pioneer gangs working at Dunsforth, Ouseburn, Nun Monkton and Hemingbrough.	12 chains.	On left bank opposite Wharfe's Mouth.	Reconstruction of flood bank the average height of which is 14 ft. with spoil excavated from the river's edge by Excavator No. 2. Partly placed on bank direct and remainder dumped ready for transport to other lengths.	10 chains.
On right bank between Summercroft, Long Drax, and White House, Barlow.	Reconstruction of flood bank, average height 9 ft. with 6 ft. wide crest. Spoil was excavated from foreshores and main arterial drains by Ex-	20 chains.	On left bank at Wheel Hall, Riccall.	Strengthening works consisting of 800 tons of stone and rubble delivered to the toe to protect the weak lengths. Soil excavated from Riccall Dam by Excavator No. 11 and transported in tip wagons hauled by diesel locomotive to the bank.	8 chains.
			On left bank at West Field, Riccall.	Construction of new flood embankment to an average height of 12 ft. The average width of the base of the bank was 75 ft. Crest width was 6 ft. and side slopes 3 to 1.	33 chains.

Site of Work.	Nature of Works	Length dealt with 1938-39.
	Excavator Nos. 11 and 15 excavated the soil from field Nos. 40 and 417 in Riccall Parish, and loaded into tip wagons which were hauled by three diesel locomotives on to the bank.	
On left bank at Riccall Ings near Angram Clough.	Construction of new flood embankment to an average height of 14 ft. Excavator No. 11 excavated soil from field Nos. 408 in Riccall Parish and 14, Barlby Parish and loaded into tip wagons.	5 chains.
On left bank between Cleek Hall and Barlow Lane End Farm.	The partial construction of a new flood embankment to an average height of 8 ft. Excavators Nos. 11 and 15 excavated soil from field No. 612 Cliffe-cum-Lund Parish. The spoil was loaded into tip wagons and hauled by three locomotives on to the bank.	15 chains.
On left bank at Hemingbrough Hope.	The protection of the length of weak embankment above Hawse Clough field No. 2, Cliffe-cum-Lund Parish, by the placing of stone at the toe. In addition to the foregoing works 2,767 tons of stone and tons of brick were deposited at the toe of banks subject to erosion, and 15,000 faggots were laid to accrete warp on weak lengths of bank.	

(5) RIVER AIRE.

On the River Aire 1,910 tons of stone and 64 tons of brick were also delivered to banks subject to erosion between Haddlesey and Aire's Mouth. 8,000 faggots were laid on the River Aire banks as a protective measure.

(6) RIVER SWALE.

Helperby Field No. 256.

To avoid extensive and costly repairs to the existing weak and breached lengths of bank on the left side at Helperby, a new bank about one quarter of a mile in length was built across country to shorten a long loop of bank. Its dimensions were 4 ft. wide at the top with $2\frac{1}{2}$ to 1 side slopes. Excavator No. 11 excavated a good quality of clay from a suitable spoil pit and loaded it into tip wagons which were hauled to the new bank by diesel locomotive. Power rammers were used to consolidate the material in layers. This work was completed in October, and the whole bank returned.

The cost of this work was shared equally by the Ministry of Agriculture, the Catchment Board and the Owner.

(7) RIVER CALDER.

(a) Bank reconstruction at Halifax Corporation Sewage Works.

A bank improvement scheme was carried out on the right bank of the River Calder at the Halifax Corporation Sewage Works near Copley.

The scheme was prepared by the Catchment Board at the request of the Halifax Corporation who agreed to pay one-third of the cost. This scheme was approved by the Ministry of Agriculture and Fisheries as a grant-earning scheme.

A stone wall was built at the toe of the river bank and carried up to about 7 ft. above normal river water level. Excellent stone was available locally at a very reasonable cost from a demolition scheme being carried out by the Corporation. About 1,150 tons of this material formed a first rate foundation upon which was erected an earthen flood embankment. This was finally trimmed and sown with grass seed. The length of bank dealt with was about 330 feet.

Photographs on page 57 show a general view of the stone wall in position, upon which is being placed the soil for the flood embankment, and give a close up view of the stone wall at the foot of the river bank.

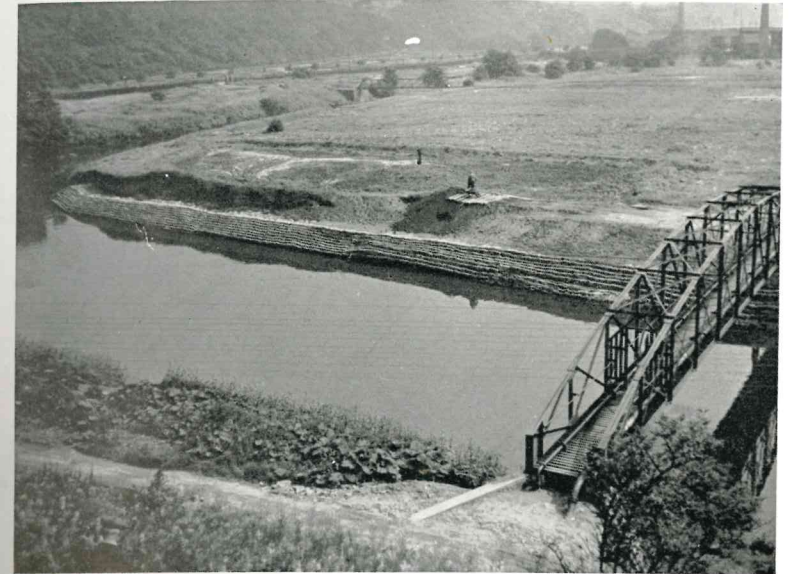
(b) Channel clearing at Todmorden.

A small grant earning scheme was carried out in the River Calder immediately below Callis Bridge, Todmorden, the Todmorden Rural District Council contributing one-third of the cost. The work was necessitated by the frequent flooding of the main Halifax-Todmorden-Rochdale Road.

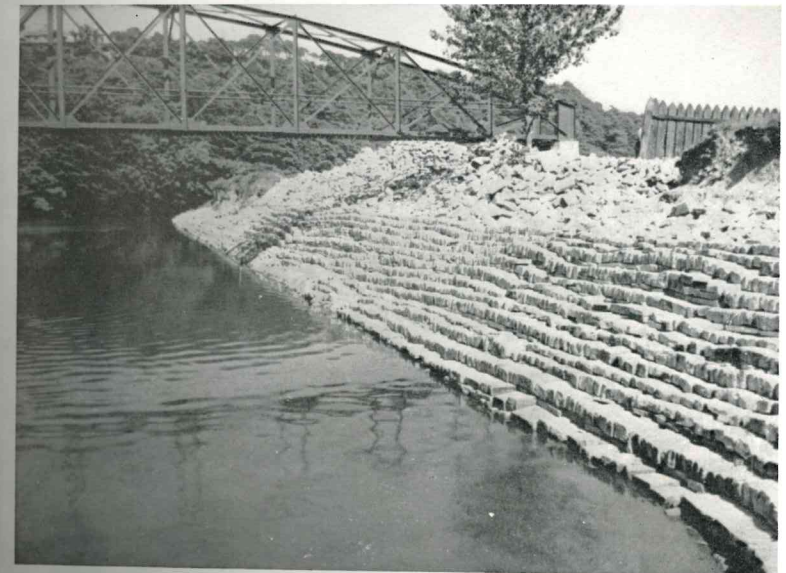
Two large shoals were cleared out from the river bed and the channel cleared of all obstructing trees and vegetation. These had in the past been a partial cause of the accumulation of heavy gravel shoals. It is hoped that this work will considerably reduce the frequency of flooding at this point.

WORKS OF MAINTENANCE.

Situation.	Nature of Works.
(1) River Ouse.	
(a) Aire's Mouth to Trent Falls.	Banks raised and strengthened where necessary. Weeds and grasses cut twice by hand.
Whitgift Village.	Low lengths of bank raised by soil from Church Lane Dyke.
Ousefleet.	Raising and strengthening flood bank below Calves Head Lighthouse.
(b) Derwent Mouth to Blacktoft.	Weeds and grass on bank mown twice. Vermin killer employed and vermin burrows made good.
Burr Wheel.	Short length of left bank raised and strengthened.
Derwent Mouth to Asselby Landing.	Ten weak points on the left bank repaired after the floods of 8th and 9th January, 1939.
Aire's Mouth to Blacktoft.	Banks mown and vermin burrows dug out.
Between Aire's Mouth and Boothferry Bridge.	530 yards of left bank raised and strengthened. Soil obtained from borrow pit on foreshore and conveyed to site by means of diesel locomotive and tip wagons.
Howden Dyke.	350 yards of bank raised and strengthened.
Howden Dyke.	160 tons of brick rubble deposited at toe of bank in front of the Ouse Chemical Works.
Skelton School House.	Bank raised and widened and 300 tons of brick and concrete rubble placed at toe of bank.
Skelton.	Erosion of foreshore arrested by means of kidding.
Goole Railway Swing Bridge. Left Bank.	175 yards of foreshore built up with the aid of fascine work.
Blacktoft Clough.	Due to frequent slips it was necessary to set back and rebuild 49 yards of the bank near Blacktoft Clough. The bank was also repitched with existing



**River Calder. Halifax Sewage Works.
Stone pitching to protect bank.**



A near view of same.



**River Ouse. Riccall.
Breach in left bank.**



Breach temporarily repaired.

Situation.	Nature of Works.
Blacktoft Clough (cont).	stones. 300 yards of the left bank were made good and strengthened. The material was obtained from old spoil heaps and conveyed to the site by means of a diesel locomotive and tip wagons.
(c) Wharfe's Mouth to Aire's Mouth.	Caterpillar Tractor No. 5 with mower cut the grasses and weeds twice; once in early summer and again in early autumn. Inaccessible portions were cut by Allen Power Mowers. Two vermin killers were continuously employed on all banks and the following vermin were destroyed:— Rabbits 1,348. Rats 7,279. Moles 7,766. Stoats 243.
Kelfield.	Vermin burrows made good, trees removed by caterpillar tractor, fences repaired and adjoining low places raised.
Riccall.	Digging out vermin burrows. Low places in old embankment raised. 600 trees planted consisting of Oak, Ash, Beech, Alder, Spruce, Larch and Scotch Fir. Two breaches repaired in field No. 408 subsequent to flood on 10th January, 1939. See page 58.
Barlby.	Three breaches repaired after January 1939 flood, on length above Turnhead village. Low and weak places repaired near Barlby Landing and Cherry Orchard.
Selby.	Low places in banks raised near Rosscarrs. Ten chains of flood embankment in Fields Nos. 478, 479 and 480, Selby Parish, reconstructed. Excavator No. 16 excavated soil from the foreshore and deposited direct on bank. Consolidated in layers by power ramming. Where overflows occurred on 10th January, 1939, low places were subsequently raised. In addition to these works, 4,653 tons of stone were deposited at the toe of banks subject to erosion, and 5,000 faggots were laid to encourage warping.

Situation.	Nature of Works.
Cliffe-cum-Lund.	Bank below Newhay in Fields Nos. 6 and 7 raised and strengthened to a height of 20 ft. 6 in. O.D. with a 6 ft. crest. Minor repairs between Goole Hall and Newhay, raising and strengthening at low places near Barlow Lane End Farm, Cleek Hall, and Turnham Hall. Banks on the length of slip in Fields Nos. 602 and 612 repaired and raised. Six-chain length of fascine inserted at weak toe near Cleek Hall.
Hemingbrough.	Strengthening works and repairs carried out subsequent to the overflows in January, 1939, in Fields Nos. 57, 61 and 63. Vermin holes made good.
Newland.	Digging out vermin holes, consolidating bank. Subsequent to flood in January, 1939, crack and slip opposite Asselby Island repaired. Toe strengthened by 160 tons of stone and brick transported from York. Bank between Willow Row Clough and Deaconfield Clough repaired and strengthened; two cargoes of stone placed at toe in weak portion.
Long Drax.	Low places raised and vermin burrows filled in and rammed.
Barlow.	In Field Nos. 225 and 226 flood bank reconstructed with soil from foreshore. Excavator No. 16 dug soil and placed direct on to bank which was trenched and consolidated by power ramming. 40 chains of bank in the vicinity of Thief Lane End was thus dealt with. The crest level was raised to 20 ft. 6 in. O.D.
Wistow Lordship.	Serious overflows having occurred on numerous lengths between Wistow Landing and the Providence Oil Mills, Selby, on the 10th January, 1939, a gang was continuously employed until early summer raising low places and strengthening weak portions. These were notably at Bank House, opposite Ouse Mechanical Works, opposite Barlby Landing, in the vicinity of Great Clough, and in Field Nos. 28, 18, 5, and 4 in Wistow Parish. Vermin burrows made good, fascines inserted

Situation.	Nature of Works.
Cawood.	in weak places and trees removed from banks and foreshores by Caterpillar Tractor No. 5. Where vermin burrows had weakened the bank these were dug out and consolidated. Tree roots and growing bushes were removed from the flood banks in Field Nos. 5, 299 and 182, and vermin burrows made good.
(d) Wharfe's Mouth to Kirby Hall.	The Beningbrough bank upstream to Newton-upon-Ouse was mown twice. The lengths between Naburn Lock and Wharfe's Mouth were mown where necessary. The length between Acaster Roving and Kelfield Grange was mown twice by Caterpillar Tractor No. 5. On the latter length tree roots and bushes were removed by the same machine.
Acaster Malbis.	Vermin burrows made good. A 20-chain length of flood embankment on the right side between Naburn Lock and Thomas Dyke was repaired and strengthened and portions which were broken were replaced by a new embankment. Light railway track and tip wagons were utilised to transport the soil from a dyke in the vicinity.
Stillingfleet and Kelfield.	Weak banks repaired.
Naburn.	Bank repairs. Vermin burrows dug out and consolidated. The left bank below Naburn Hall to a point near Naburn Roving was raised and strengthened with soil transported from a foreshore nearby in tip wagons this work continuing downstream at the end of the year.
Bishopthorpe.	Channel obstructions removed.
Fulford.	Obstructions removed from channel.
Middlethorpe.	Several weak portions of bank attended to.
York.	Stone and brick rubble from York Castle and other demolition works loaded into barges at Kings Staithe, Queen's Staithe, Marygate, Dutton's

Situation.	Nature of Works.
York (cont).	Landing, and Hungate, (River Foss) and transported downstream to tidal river works and upstream to the Rivers Ure and Swale. Repairs to the Board's floating craft carried out and Barges Nos. 2, 3, 4, Tug "Aid" and Grab Dredger No. 1 painted. Lifting tackle, wire ropes, chains, gin wheels, shackles, turn buckles, surveyed and replaced with fully certified equipment.
Clifton.	Obstructions removed from channel.
Overton.	Repairs to low and weak portions of bank on the left side.
Moor Monkton.	Weak banks strengthened and raised.
Beningbrough.	Low places in banks raised. Vermin burrows dug out, bank consolidated. Trees on the slopes of the bank removed. The left bank below Warp Gate repaired for a distance of 5 chains with soil from adjoining land.
Linton-upon-Ouse.	A breach in the flood bank in Field No. 116, opposite Cuddyshaw Reach repaired. Light railway equipment from Selby facilitated transport of soil from foreshore downstream from Reach. Length completed 4 chains.
Widdington.	Obstructions in channel removed, suitable material growing on right bank formed into faggots for fascine work.
(2) River Aire.	
(a) Aire's Mouth to Knottingley.	In the Lower Aire District and Airmyn district the flood banks were mown during the summer and autumn mostly by hand. Lengths between Newland and Carlton were mown by the Caterpillar Mower No. 5 and Allen Power Mower. Five small gangs employed throughout the year on maintenance works.

Situation.	Nature of Works.
(b) Lower Aire District.	A vermin killer continuously employed on banks in this district.
Little Airmyn.	Raising and strengthening banks.
Newland.	Vermin burrows made good and low places raised.
Little Rusholme.	Vermin burrows made good.
Rawcliffe Ferry.	Low places raised.
Germaine's Lane End.	Bank repairs.
Jefferson's Clough, Newland.	Vermin burrows made good.
Eskamhorn.	Low places at fences raised and vermin burrows made good.
West Marsh, Carlton.	Bank raised.
Carlton Marsh.	Two cargoes of hard limestone delivered and placed in position at toe of weak left bank. Vermin burrows made good.
Hirst Courtney.	Slips and cracks subsequent to January 1939 flood consolidated by power ramming and low places raised.
Temple Hirst.	Vermin burrows made good and low places in bank raised.
Chapel Haddlesey.	Low places in bank raised.
(c) Airmyn District.	A new flood embankment extending to 8 chains was built on the upstream side of Boothferry Bridge. Soil was dug from the river's edge and barrowed to the site and consolidated by power ramming. Similar repairs carried out a quarter of a mile below Boothferry Bridge. During flood conditions usual patrols carried out and leaks attended to. Vermin burrows dug out and consolidated, grasses mown twice.

Situation.	Nature of Works.
(d) Rawcliffe to Hensall.	The flood banks were mown during the summer and autumn, mostly by hand. The weak bank near Rawcliffe Ferry was raised and strengthened, the slip at Bell Lane, Rawcliffe, was further strengthened by the deposit of two cargoes of stone and the insertion of a fascine. Willows were cut and removed from the foreshore at Airmyn and transported by water upstream to weak portions of bank at Rawcliffe, Snaith and Gowdall. Leak at the old warping clough repaired and secured by the driving of a timber dam.
East End Rawcliffe.	Vermin burrows dug and bank strengthened.
Eskamhorn Ferry.	Bank repairs.
Snaith.	Low places in bank raised.
Gowdall .	Six cargoes of stone and brick transported by the Board's craft from York, deposited at the toe of the weak length upstream from Gowdall Clough. In addition to the foregoing works, 1,520 tons of stone, and 4,000 faggots were delivered and placed in position to protect eroded portions of bank.
(e) Hensall to Knottingley.	Only the most important lengths were mown twice during the year.
Beal and Haddlesey.	Weak and low portions in bank raised and strengthened.
Kellington Marsh.	Raising of flood bank and digging out vermin holes on several lengths of the right bank.
Hensall Ings.	Low places raised and strengthened.
Kellingley Ings.	Bank repairs at low places.
(f) Airedale District.	A small gang has been employed continuously on repairs to both banks in this district.

Situation.	Nature of Works.
Sturton-with-Thorlby.	Gravel shoal removed from channel about one furlong below Ingha Bridge, Field No. 68. Projections on river's edge removed and a uniform channel formed. Eroded lengths of bank protected by the construction of dry stone walls with boulders. Other eroded lengths protected by timber work, the owners of Skipton Castle supplying the timber.
Skipton.	Weak and low lengths of bank raised.
Silsden.	Subsequent to the January flood a large breach on the left bank in the field below Silsden Sewage Works was repaired, and for a distance of three chains a new bank was built. Soil was obtained from a wide foreshore and carted downstream. 125 tons of stone were delivered and placed at the toe of bank at same point.
Steeton.	Low lengths of bank raised, notably at fences.
Eastburn.	Gravel was removed from the gravel traps on the right bank at the Eastburn Beck Confluence.
Castleford.	Small gang assisted by small excavator engaged in strengthening and rebuilding left bank adjacent to Lock Lane. Length dealt with 1,000 feet.
(3) River Wharfe.	
(a) Wharfe's Mouth to Tadcaster.	Obstructions removed from the channel and grasses and weeds growing on flood banks mown by hand where necessary.
Acaster Selby.	In Field No. 14 on left bank, lengths of broken bank were repaired and strengthened with soil dug from foreshore. Light railway track and tip wagons were used for transporting the soil. Similar work carried out in Field No. 15, and in Field No. 3. At the latter point in Wharfe Ings a new

Situation.	Nature of Works.
Acaster Selby (cont).	bank was built behind the broken one over a distance of six chains. 105 tons of stone and broken concrete transported by the Board's craft from York was placed in position at the toe where eroded.
Nun Appleton.	Low places in East Ings raised.
Ryther.	Bank raised and strengthened in Field No. 7. Low places at stiles in Field No. 1 raised.
Ozendyke.	Four chains of cradge bank repaired.
Bolton Percy.	Breach in Field No. 174 repaired with clay from high ground adjacent. Low length extending to six chains. Hornington Ings raised.
Ulleskelf.	Eight chains of bank raised and strengthened between North End Clough and Field No. 131.
Grimston.	Four chains of bank raised and strengthened below Batter Ness. Trees and bushes stubbed and bank consolidated.
Oxton.	Low places raised.
Thorp Arch.	Channel obstructions removed below from the weir and the river bed in stream.
Boston Spa.	Obstructions removed from the channel.
(4) River Nidd.	
(a) Nidd's Mouth to Skip Bridge.	Where necessary the flood banks were mown during the summer, mostly by hand. A gang of six men were employed during part of the summer removing obstructions and repairing weak lengths of bank on both sides.
(b) Skip Bridge to Ribston Park.	During part of the year a small gang was employed in removing major obstructions from the channel. The obstructions accumulated on Hunsing Weir were also removed clear of the waterway.

Situation.	Nature of Works.
(5) River Ure.	
(a) Kirby Hall to Boroughbridge. Lower Dunsforth.	Field No. 149 bank repaired, vermin burrows dug out and bank consolidated. In Field Nos. 63, 64 and 65, three breaches were repaired, vermin burrows dug out, bank consolidated and low places raised.
Aldwark.	Weak lengths of eroded bank in Field No. 85 repaired.
Myton-on-Swale.	670 tons of stone and brick from York delivered to the toe of eroded bank in Field No. 155 and the banks opposite. Low places in Field No. 153 raised and vermin burrows dug out and consolidated.
Thornton Steward.	Subsequent to the flood in January, 1939, when leaks were marked by pegs, the left bank between Danby Grange and Broading Wood, was repaired. Vermin burrows were dug out and consolidated. At five different places where the flood bank had been attacked and the toe broken, repairs were effected by the construction of concrete groynes. The gravel was obtained from shoals in the river adjacent. Wire cages were utilised to form a reinforced toe. In Field No. 16 where the bank had subsided at the outlet to Woodhouse Farm Culvert, the fore-shore was excavated, the displaced culvert re-set and extra concrete haunching placed in position. At the end of the year, work was proceeding on the replacing of the soil on the bank slopes.
(6) River Swale.	
Swale Nab to Skipton-on-Swale.	A gang of fourteen men were employed for the greater part of the year on maintenance works and repair of breaches on both banks. The flood at the beginning of January was the result of a rapid thaw after a period

Situation.	Nature of Works.
Swale Nab to Skipton-on-Swale (cont).	of intermittent snow falls, commencing at the middle of December, 1938. This flood exceeded in height any previously recorded flood during the regime of the Catchment Board. 68 breaches occurred and the following are the details of the most important ones which have been repaired. Many breaches are still unrepaired.
Cundall-with-Leckby, Field No. 84.	A breach extending to 26 yards was repaired in Field No. 84.
Brafferton.	Three breaches in Field No. 160 repaired and a length of new bank built in the same field. Excavator No. 11 dug the soil from the foreshore which was loaded into tip wagons and conveyed to the site. The bank was consolidated in layers by power ramming.
Humberton.	Small breach repaired in Field No. 70. Vermin burrows dug out and bank consolidated.
Helperby.	Field No. 256. Two breaches repaired and a length of weak bank protected by a fascine of thorns and willows. Field No. 334. Two breaches repaired and cross bank reconstructed. Field No. 336. Small breach repaired.
Baldersby.	Small breach repaired, vermin burrows dug out and bank consolidated in Field No. 147. Breach in Field No. 184 repaired.
Catton.	Breach in Field No. 88 repaired. Fields Nos 87, 160 and 167. Vermin holes dug out, holes filled in, and bank consolidated.
Myton-on-Swale.	Eight cargoes of stone and brick from York were delivered to the toe of the right bank.

Situation.	Nature of Works.
Myton-on-Swale (cont).	Field No. 131a. Flood bank thoroughly dug over to trace numerous vermin burrows and reconstructed as far as Myton Pasture Clough. Between Swale Nab and Myton Bridge the floating grab dredger No. 1 was employed on removing obstructions and shoals from the river bed and depositing the material on the left side. The bend opposite Myton Hall was eased by dredging the toe from the right bank which formed the Ness and the material was deposited behind the rough stone wall, built two years ago, to protect the left bank. Five breaches repaired and a length of six chains where serious overflowing occurred were raised. A further length of four chains which was riddled with small holes was reconstructed.
Eldmire-with-Crayke Hill. Field Nos. 5 & 6.	Bank cleared of accumulations of undergrowth and trees, vermin holes dug out, filled in and consolidated.
Cundall with Leckby. Fields Nos. 109, 112, 114, 118 & 121.	Willows removed from channel, banks repaired and vermin burrows dug out.
Topcliffe. Field Nos. 5, 8, and 9.	Vermin holes dug out and bank cleared of growing vegetation.
Asenby. Field Nos. 38 & 39.	Vermin burrows dug out, holes filled in and consolidated.
Thornton Bridge. Field Nos. 34, 64 and 87.	do. do.
Skipton-on-Swale. Field Nos. 5, 18 and 20.	do. do. A vermin killer also was continuously employed on both banks during the year and the following vermin were destroyed :- Rabbits 3,529. Rats 225. Moles 223. Stoats 5.
Skipton-on-Swale to Morton Bridge.	The flood of January 9th and 10th, 1939, caused considerable damage to the banks on this length and in numerous cases accentuated damage caused by the flood of December, 1936.

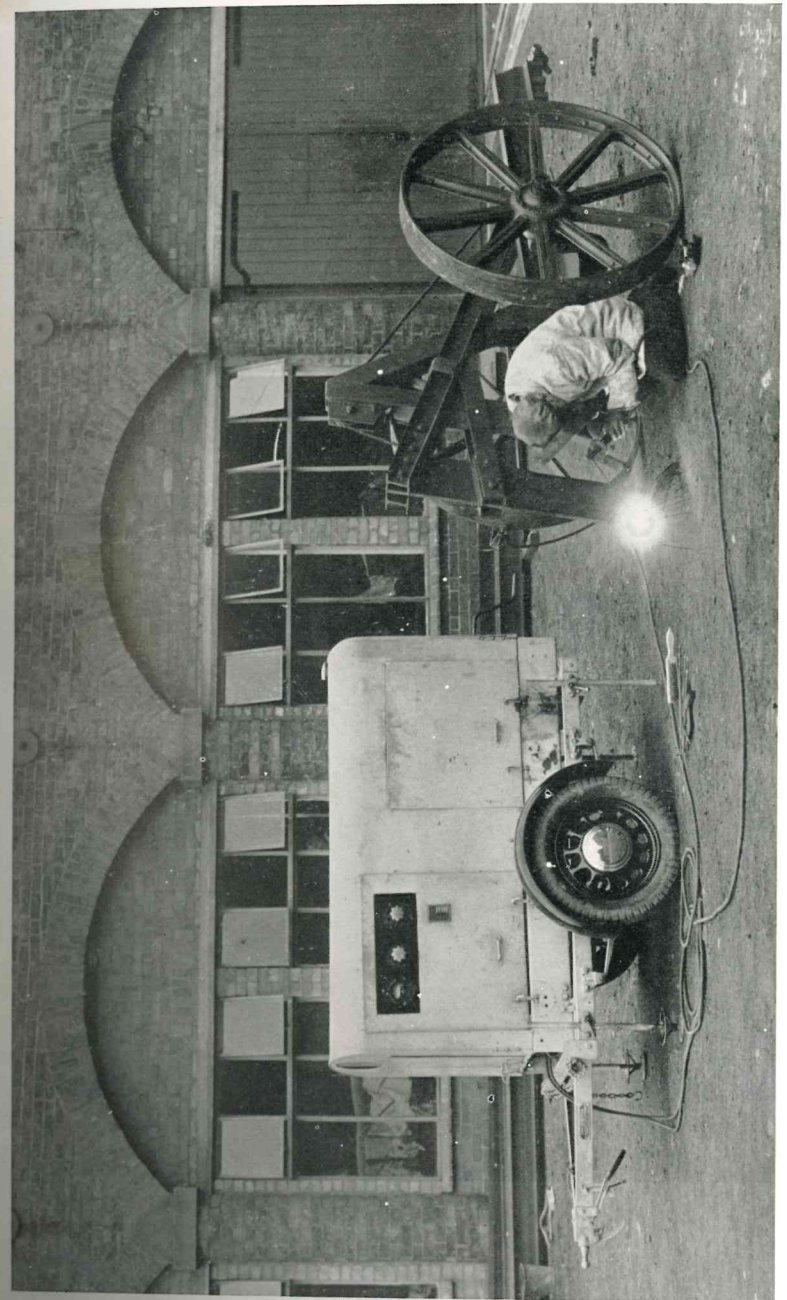
Situation.	Nature of Works.
Gatenby. Field Nos. 24 and 30.	Eight small breaches repaired. Vermin burrows dug out, filled in and consolidated.
Holme-on-Swale. Field Nos. 72, 73, and 75.	Vermin burrows dug out, filled in and consolidated. Several lengths of weak and broken banks were repaired in Field Nos. 72 and 73. Field No. 70. A three-chain length of bank which was breached was replaced by the construction of a new bank over a distance of eight chains in the field behind. Remnants of the broken bank were utilised to form the new bank while the remainder of the spoil was dug from higher portions of land in the same field. The material was transported on light railway track in tip wagons hauled by diesel locomotive. Field No. 27. A similar improvement to that described above was carried out over a distance of eight chains of the downstream side of Swale Lane.
Pickhill-with-Roxby.	Vermin burrows dug out, filled in and consolidated. Field Nos. 135 and 136. Several broken lengths of bank repaired.
Maunby.	Vermin burrows dug out, filled in, and bank consolidated. Field No. 25. Eighteen yards breach repaired. Field No. 22. Three small breaches repaired. Field No. 24. One small breach repaired.
Morton Bridge to Catterick Bridge. Field No. 295.	Two breaches repaired, spoil dug from a borrow pit in Field No. 287, and transported to the site in tip wagons.
Field No. 298.	Three small breaches repaired. Field No. 8: Thorn material cut and placed in position for the protection of the toe, and a groyne repaired.
Kirkby Fleetham. Field No. 416.	Three breaches repaired by owner in accordance with Catchment Board advice.

Situation.	Nature of Works.
Killerby. Field No. 49.	The groyne constructed by the Board three years ago had accumulated large quantities of gravel at the base of the bank sufficient to afford protection from further erosion even on the occasion of the record flood of 9th and 10th January, 1939. The upstream faces of the groyne, however, suffered considerable damage and the five lower ones were repaired and reinforced. The gravel for the concrete was boated across the river and placed in position in steel wire cages.
Kiplin. Field No. 8.	Three small breaches repaired, vermin burrows dug out, filled in and consolidated. Field No. 11. Two small breaches repaired, vermin burrows dug out, filled in and consolidated. Field No. 6a. Two large breaches repaired, vermin burrows dug out, filled in and consolidated. Field No. 83. Four breaches repaired, vermin burrows dug out, filled in and consolidated.
South Ellerton.	Three breaches repaired, vermin burrows dug out, filled in and consolidated, two groynes repaired. A length of toe protected by the insertion of a fascine of thorns and willows.
Great Langton.	Numerous small breaches repaired, vermin burrows dug out, filled in and consolidated.
Morton-on-Swale.	Several small breaches repaired, vermin burrows dug out, filled in and consolidated.
Thrintoft.	Vermin burrows dug out, filled in and consolidated.
Leeming.	Several small breaches repaired, groyne reinforced and raised. Vermin burrows dug out, filled in and consolidated.

Situation.	Nature of Works.
Skipton-on-Swale to Catterick Bridge.	A vermin killer was continuously employed on both banks on this length during the year, and the following are the numbers of vermin destroyed :- Rabbits 4,092. Rats 129. Moles 113. Stoats 20.
(7) River Don. Doncaster to Thorne.	A maintenance gang of one foreman and twelve men including one vermin killer, have been continuously employed. Weeds and grass were cut by hand and motor mower. A caterpillar tractor equipped with mower was delivered during the Summer. This released the gang for other work and allowed men to be employed on hand cutting weeds down to normal water level. The improvement in the banks due to more frequent mowing is already very marked.
ditto.	Banks patrolled day and night during flood periods and leakages noted and marked. Vermin killer employed continuously catching rats and moles. Banks inspected weekly, rat and mole holes filled in and fences made good.
Long Sandall to Don Railway Bridge at Thorpe.	Raising and strengthening banks including trenching and puddling where serious leakages had been observed.
Wheatley to Barmby Dun.	Bushes and thorns, etc., removed from embankment, banks made good and sown with grass seed.
Thorne to Goole.	A foreman and eight men including a vermin killer are employed for most of the year on this length. All banks patrolled on high tides and leakages noted and repaired. Weeds and grass were cut by hand and motor mower.
Above New Bridge.	Slips in right bank alongside main road kidded and repaired.
New Bridge to Goole.	Bushes and thorns removed, embankment made good and sown with grass seed. Embankments repaired and leakages made good. Low places raised and banks strengthened.

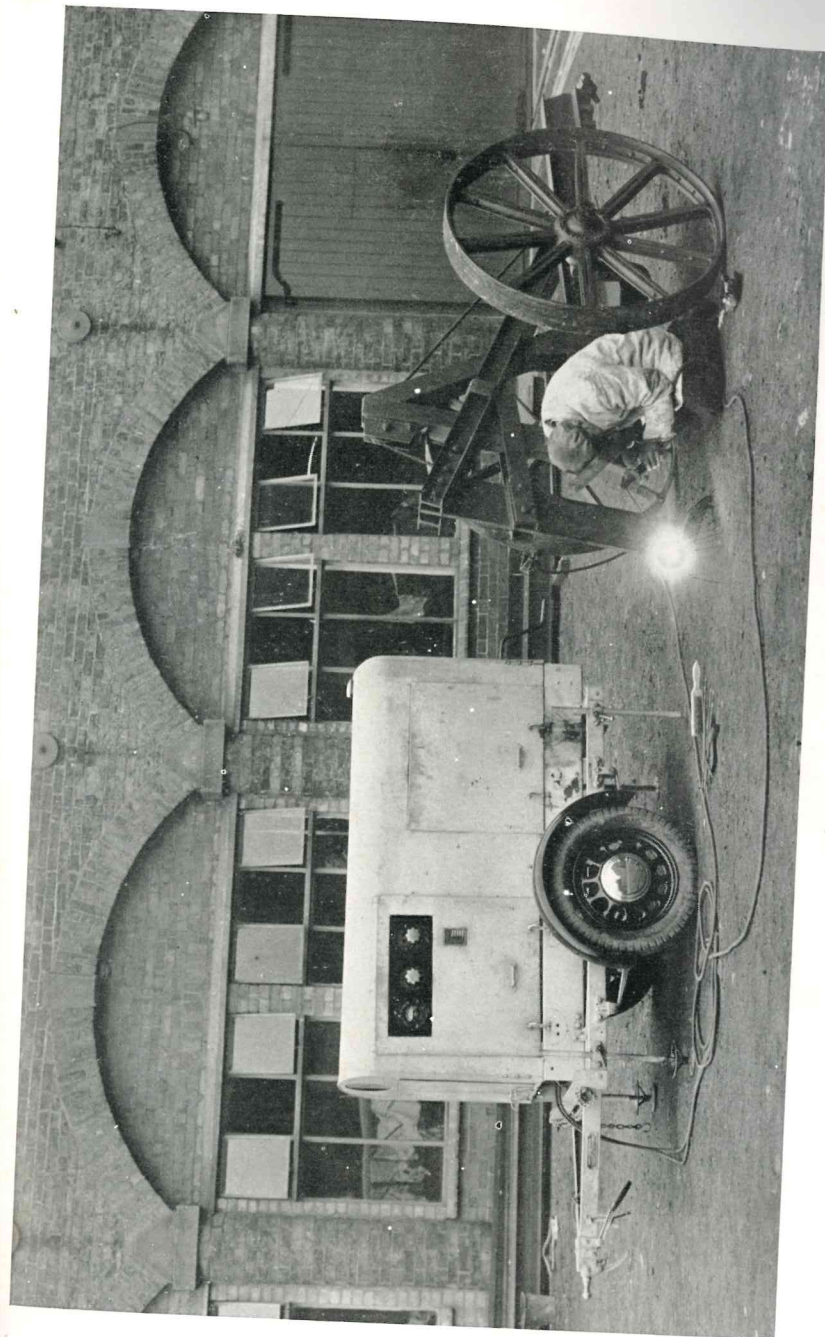
Situation.	Nature of Works.
(8) River Dearne. Bolton Ings.	Repairs to breaches in right bank.
(9) River Rye. 400 yards upstream from confluence of River Rye and River Seven.	Setting back and reconstructing 80 yards of left bank.
On additional length of river taken over from junction of main river with River Seven to its junction with River Rical.	All bushes and willows cut and numerous minor repairs carried out on banks.
Field No. 27, Parish of Ness.	Dangerous parts of bank set back and strengthened.
Left bank opposite St. Bede's Church, Ryton.	80 yards of bank set back and reconstructed.
200 yards downstream from junction of River Rye and River Holbeck.	Bad slip repaired on right bank.
760 yards upstream from Butterwick Bridge.	50 yards of right bank set back and reconstructed.
(10) River Derwent. Barmby-on-the-Marsh.	Prior to commencement of the bank improvement scheme in May 1939, considerable work was necessary in order to maintain the bank at a safe level. The soil required to effect repairs was obtained from the foreshore and conveyed to the site by means of a diesel locomotive and tip wagons.
Hemingbrough Landing.	After a bad slip 103 yards of the bank were set back and reconstructed.
Chain House, Barmby to Loftsome Bridge.	Willows cut on both banks.
Between Loftsome Bridge and Pasture Clough.	Various low portions of bank raised 18 inches.
Near Brackenholt Farm.	Short lengths of bank "guttled" and consolidated by means of power rammers.

Situation.	Nature of Works.
Loftsome Toll Bridge to Wressell Railway Bridge.	600 yards of right bank "guttled" to a depth of 6 feet, refilled and power rammed. Bank also raised and strengthened.
At Loftsome Bridge Toll House.	Bank raised and strengthened.
Between Wood Hall Landing and Loftsome Bridge.	Right bank repaired at numerous points after floods of 8th and 9th January, 1939.
Menethorpe Hall.	Raising and strengthening of cross bank.
Bank adjacent to Public Road at Brighton Corner.	Bank made good on three occasions after subsidence.
Field No. 25 South Duffield.	Fences and hedge repaired and drinking stead excavated.
Gunby Ings.	20 yards of bank raised 18 inches.
Bubwith Bridge.	After the January floods of 1939, wave action, set up by strong winds blowing over the flooded Ings, had partly washed out the back portion of the bank. This has been repaired.
Aughton.	Repairs to breaches and weak portions of 450 yards of left flood bank.
North Duffield Carrs.	Bank repaired and made good after removal of two trees.
Opposite Ellerton Landing.	200 yards of bank raised and strengthened.
Stamford Bridge.	At Stamford Bridge Lock House seven large poplar trees, which were likely to endanger the safety of the Lock House, were felled and removed. This work was undertaken by D. Kitching & Sons Ltd., Knaresborough.
Kirkham Abbey.	Repairs were carried out to the timber footbridge over the upstream Lock gate.
New Plantation at Old Malton.	Short lengths of the right bank which subsided were repaired.

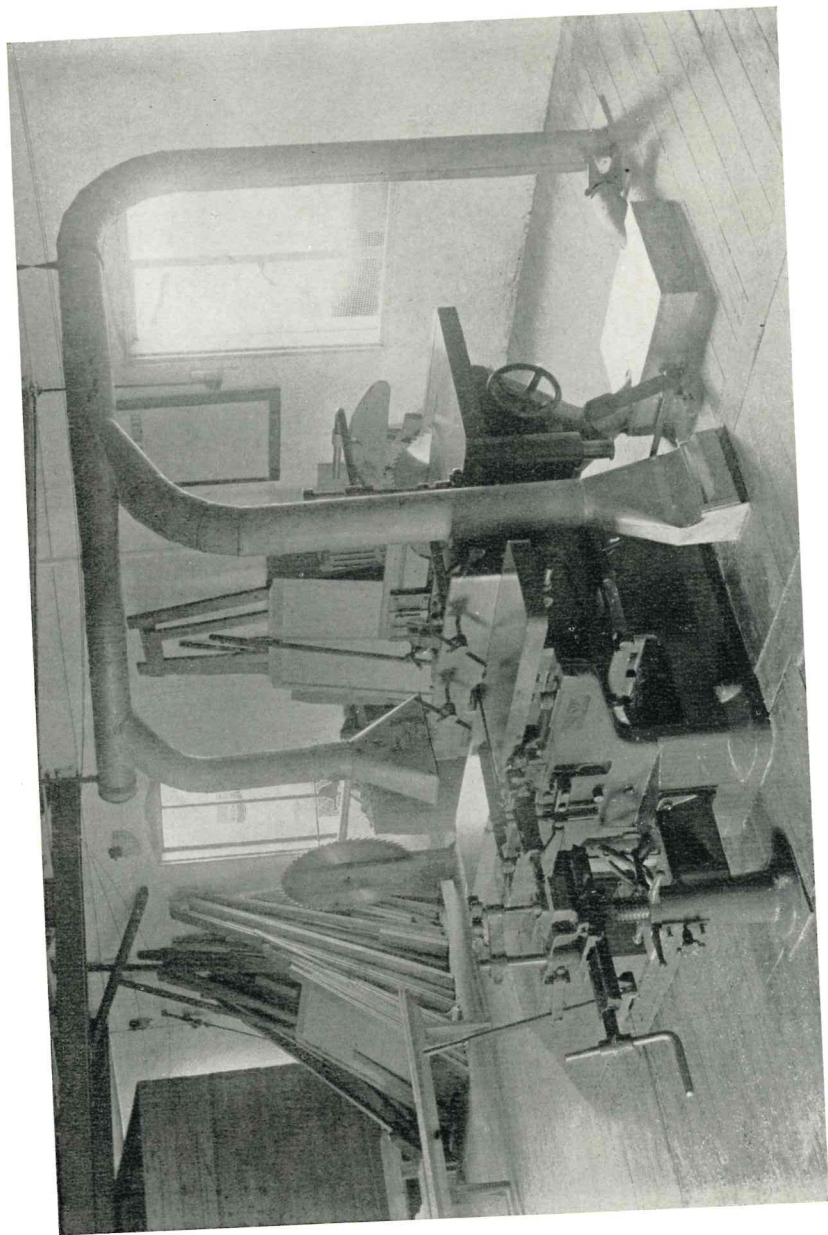


Thorne Workshop.
Electric Welder at work.

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At Loftsome Bridge Toll House.	Bank raised and strengthened.
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Thorne Workshop.
Electric Welder at work.



Thorne Workshop.
Universal woodworking machine.

Situation.	Nature of Works.
Yedingham to Rye Mouth.	Weeds growing in the river channel were cut and removed twice during the Summer.
Derwent Mouth to Yedingham.	Weeds and grass mown on both banks Attention given to destruction of vermin and making good damage in banks caused by burrows.
(11) River Calder.	
Altofts.	Small gang strengthening flood embankment and stoning toe of right bank on Lord Halifax's Estate.
(12) Sea Cut.	General works of maintenance have been the removal of silt, gravel deposits and the weeding of the Sea Cut Channel, clearing brushwood and plashing and repairing fences. Returfing the crest of the south bank a distance of 500 yards and increasing the width of waterway west of Mowthorpe. Forming mattresses of thorn kids weighted with stone to protect the bed of the channel west of Scalby Bridge. During October the number of employees was reduced from three to two men.

WORKSHOP.

The Workshop has continued the repair and the manufacture of spare parts for all plant employed in the Catchment Area, and the stage has now been reached when many spare components such as fairleads, buckets and attendant spares are kept in stock for immediate despatch to replace a worn out part.

The feature of the past year's work has been the extensive use of electric welding for the fabrication and building up of parts, especially on scrapers during summer time. The Board's motor truck has been fitted with a towing attachment to enable the portable welder to be taken by road to any plant requiring its services. Records have been kept to compare the cost of electric and oxy-acetylene welding, and these records have disclosed that the cost of welding by electric arc is half that by oxy-acetylene and at the same time much less fatiguing to the welder when operating on large parts. A photograph of the electric welding plant in operation is shewn on page 75.

To accelerate work in the joiner's shop, a belt driven Universal Woodworker has been installed, with dust and chip collection plant. This plant consists of circular saw bench, planer, and thicknesser, attachment for morticing and tenoning, and verticle spindle moulder, incorporated in one machine driven from a main countershaft under the floor.

This machine has been almost continuously in use since its installation and has speeded up the output from the joiner's shop considerably, and this has been especially noticeable on the construction of store sheds for Air Raid Precautions purposes. A photograph of the Universal Woodworker is shewn on page 76.

As mentioned in last year's report a scheme was prepared for the provision of buildings in the workshop yard for the dismantling and complete overhaul of plant, and the provision of a separate welding shop. Work has been proceeding on this scheme and the welding shop is almost ready for occupation. The steelwork for the large buildings, however, is delayed by the makers owing to the outbreak of war, but it is hoped that delivery will soon be effected.

STOREYARD.

It will be realised that much of the outside work on river schemes are only possible during the months from April to October, and in consequence many items of plant have to be stored during the winter months. Moreover delivery of materials has become very erratic and it is necessary to carry increased stocks of materials and to have available plant to deal with any emergency.

Although some plant may be stored without harm in the open, it was necessary to obtain some central place for storage provided with a shed for such plant and parts which would deteriorate if stored in the open.

With these considerations in mind, an area of land owned by the Board near Jubilee Bridge, has been fenced with serrated top corrugated iron sheeting, and access and gates are provided to the main road and also to the river. A horse-shoe shaped road connects up with the main access road and thus gives access to the storage spaces in the yard.

For the storage of plant and materials under cover a steel and corrugated iron shed is in course of construction. The dimensions of this building are 40 feet long and 40 feet wide, and the one gable is designed to be removable for extension purposes. The other gable is fitted with sliding doors of sufficient width and height to permit the entry of a large lorry, so that plant and materials may be delivered or taken directly into or out of the shed.

PLANT.

The following items of plant have been purchased by the Board during the year :—

Plant.	H.P.	Supplied by	Cost	Delivery	Where operated.
Graveley Tractor & Mower.		Conway Ltd.	90 5 0	Nov. 1938.	River Don
8" Lathe.		Dean, Smith & Grace Ltd.	325 0 0	Jan. 1939.	Workshop
Universal Woodworker.		Engineers' Supply Co.	223 0 0	Feb. 1939.	Workshop
Portable Electric Welding Set.		General Electric Co.	260 2 0	April, 1939	River Don
Diesel Locomotive.	20	F. C. Hibberd & Co. Ltd.	350 0 0	do.	River Ouse
do.	do.	do.	350 0 0	do.	do.
Cambridge Roller		J. H. Tyson	37 10 0	do.	do.
Smith "Seven" Excavator.		Thos. Smith & Son (Rodley) Ltd.	992 0 0	do.	do.
do.		do.	992 0 0	May, 1939.	do.
Petrol-driven Friction hoist.		R. C. Gibbins & Co. Ltd.	85 5 0	do.	River Don
10 R.B. Excavator		Ruston Bucyrus Ltd.	1207 0 0	do.	do.
Power Rammer	3	C. H. Johnson & Son Ltd.	270 15 0	do.	do.
do.	3	do.	270 15 0	do.	River Ouse
Parmiter Harrows.		Croft Bros.	19 4 3	do.	do.
16 ft. Eccles Caravan.		Yorkshire Caravan & Trailer Co.	151 10 0	July, 1939.	All Rivers
Tractor and Power Mower		H. Leverton & Co. Ltd.	534 15 9	do.	River Don
Petrol Pumping Set.		Blackstone & Co. Ltd.	142 5 0	Aug. 1939.	Rivers Don & Derwent
No. 7 Vertical Boiler.		Spencer Hopwood Ltd.	163 9 6	Sept. 1939.	River Don
2½/3 cu. yard Dumper.		Aveling Barford Ltd.	450 0 0	do.	A.R.P.
do.		do.	450 0 0	do.	A.R.P.

AIR RAID PRECAUTIONS.

In anticipation of serious damage to drainage works which might be occasioned by aerial bombardment, it was decided to set up an Air Raid Precautions Organisation in the Catchment Area.

A scheme was prepared and an application for grant made to the Home Office. This scheme was finally approved.

It was anticipated that in view of the presence of many important bridges, factories, etc., situated near main rivers, serious damage might be caused to flood embankments and other drainage works, either deliberately or by misdirected bombs. If such breaches were to occur either from this cause or normal flooding, large areas of exceedingly productive agricultural land might be inundated with serious damage to the crops, a very important matter in view of the possible shortage of food. It was therefore decided to provide the necessary plant and materials required to repair such damage as expeditiously as possible.

The possibility of difficulty in transport, etc., had also to be envisaged.

It was accordingly decided to establish stores of plant and materials at several key points adjacent to main river flood embankments, so that immediate repairs could be carried out pending the arrival of heavier equipment to complete the work. Sixteen of these stores were set up, each store containing a good supply of timber, sandbags, ambulance kit, in addition to all light tools, wheelbarrows, shovels, etc., likely to be required in carrying out urgent work.

These stores were each housed in a timber hut placed at some convenient point adjacent to important banks and where possible, near a road. In addition to this, other equipment in the form of dumpers, pumps, etc., were ordered with a view to repairing any such damage in the most expeditious manner. A trailer to transport a small excavator to the site of a breach was also ordered along with a lorry for towing the trailer and excavator, and to provide transport for other essential materials.

A scheme was organised to ensure that the occurrence of breaches should be notified to the Board and steps taken to carry out repairs immediately. All the Boards employees, Army Authorities and farmers who would be likely to observe damage to embankments, were requested firstly to get in touch with the foreman having control of the length of bank affected, and secondly to notify the Board's Workshop at Thorne, at which a telephonist was on duty day and night.

The organisation provided for immediate action being taken by the local foreman who would set to work with the material provided in the nearest store hut, pending the arrival of the heavier equipment from Thorne Workshop.

In view of the possible shortage of fuel and delays in transport, tanks have also been ordered for storing about a year's supply of all the essential fuel oils used in the Board's plant.

Section IV.—DONCASTER DRAINAGE DISTRICT.

The following is a brief summary of works carried out either in whole or in part for the purpose of remedying the loss of efficiency in the drainage system of this District as a result of mining subsidence.

Dun Drainage District.

In the last annual report, reference was made to a scheme which was under consideration by the Dun Drainage Commissioners, Messrs. Barber, Walker & Company, and the Doncaster Amalgamated Collieries Ltd., to improve the drainage of a portion of the district and at the same time to remedy or obviate the loss of efficiency in the system which had occurred or would occur as a result of the working of coal. The following report on the progress of the scheme has been supplied by C. E. Farran, Esq., M.Inst.C.E., Engineer to the Dun Drainage Commissioners :—

1. The first item to be undertaken was the installation of a new pump with a culvert leading to it called the Goosepool Pump at the junction of the Bowling Alley Drain with the Old Ea Beck. Owing to running sand this work presented considerable difficulty but it has been put in hand during the year with satisfactory results.

2. The raising of the banks of the Old Ea Beck from Humberhead Drain to Bentley Moor Bridge had been practically completed inclusive of the several diversions of the course. For this work two mechanical shovels have been employed at Bullcroft Colliery loading pit dirt into a fleet of a dozen 2 yd. dumper wagons. Three dragline excavators have been employed also on the work making new cuts and getting clay for puddle coring.

The banks which are of considerable height owing to the necessity for providing for future colliery subsidence are substantially completed and it is expected that all the works other than two new bridges and alterations to two railway bridges will have been completed by the end of this year.

3. Work on the Smallholme and Tilts Drain which is a continuation of the Old Ea Beck is in progress. Where the banks are having to be raised a considerable height in anticipation of colliery subsidence the work is being done under contract by the Pipewell Ploughing Co. Ltd., of Kettering for which a dragline excavator, a tractor and 6 yd. scraper are already at work. Three other scraper sets will be put to work immediately after the winter. For those portions of the work for which no provision for subsidence was necessary the banks have been raised by means of precast concrete walling carried out under contract by Messrs. John Hadfield & Sons Ltd., Effingham Street, Sheffield. This portion of the work is complete.

In connection with this section of the works two bridges over the drain will require reconstruction and several sluices will need to be amended.

The arrangements for the purchase of Thorpe Marsh for utilisation as a washland are well in hand.

4. At Bentley Ings a new cut leading from the Bentley Mill Goit to the Bentley Barrier Bank has been made and completed except for a short length. This work has necessitated the use of a dragline excavator together with a 2 ft. gauge railway. Excavated material has been run out along the Bentley Barrier Bank making good the loss of efficiency which had occurred or was likely to occur as a result of colliery subsidence.

The purpose of the new cut is to conduct the water of the Bentley Mill Goit to a proposed new pump station on Bentley Ings which will lift the water directly into the River Don. The first section of the constructional works in connection therewith which consists of a concrete delivery culvert 54" in diameter has been commenced the contract having been let to Messrs. Wm. Birch & Sons Ltd., of Spen Lane, York.

The order for the pumping machinery is being placed with Messrs. Drysdale & Co. Ltd., of Glasgow. It is intended to instal three pumps having a capacity of 70 tons a minute each of which will be electrically operated and in addition there will be a smaller pump with a capacity of 22 tons per minute also electrically driven for dealing with the small summer floods.

5. Work on a new cut for the Bramwith Drain at Kirk Bramwith which is being carried out by direct labour is well advanced. One dragline excavator is employed here. A new outfall has been put into the Don about $\frac{1}{2}$ mile south of the present outfall. This has been constructed in timber by Messrs. George Lambert & Sons, of Askern, as it is intended to be only a temporary work until the intended river diversion at this point has been completed.

It is hoped that the new cut will be sufficiently advanced for it to be taken into use within the next few weeks. In the meantime a further cut is in progress for linking the Bramwith Drain to the Engine Drain so that at such times as the discharge of the Bramwith Drain is interrupted by flood water in the River Don the water can be diverted to the pump at Kirk Bramwith where it will be lifted into the river.

Consideration has been given to the replacement of the existing pumping machinery at Kirk Bramwith with new pumping machinery and it is hoped that an order for the machinery will be given in the next month or two.

A small drain improvement scheme in the vicinity of Thorpe-in Balne has been completed during the year with the aid of a grant from the Ministry of Agriculture and Fisheries.

Askern Main Colliery.

The following works have been or are being carried out by the Company :—

(1) Thistle Goit Drain.

This is being deepened and regraded to deal with flooding in the neighbourhood of Black Plantation. The existing pump is being moved downstream to pump into an unsubsidised length of drain.

(2) Haywood and Trumfleet Drain.

In the last report, it was stated that a pump had been installed by the Company in this drain about 300 yards east of Rushy Moor House. This electrically operated centrifugal pump of 3,500 gallons per minute capacity is now in operation.

Thorne Colliery—Black Drain Drainage District.

It was previously reported that land to the east of the Black Drain and to the south of Thorne Moor Level Crossing was subsided and periodically waterlogged. During the year, the Doncaster Area (Mining Provisions) Committee inspected the area and interviewed the landowners and representatives of Messrs. Pease and Partners. As a result, two pumps, one of 275 and the other of 1,000 gallons per minute capacity have been installed to lift water from tributary drains into the Black Drain.

The latter drain is now being piled and widened by the Black Drain Drainage Board.

General.

Levelling of areas before, during and after subsidence, has been carried out and numerous bench marks have been established in order that the rate and extent of subsidence may be accurately recorded.

Section V.—FINANCE.

ACCOUNTS.

By virtue of Section 223 of the Local Government Act, 1933, the financial year of the Catchment Board is reckoned from the 1st April in any year until the succeeding 31st March. The Accounts of the Catchment Board and their officers are subject to audit by the District Auditor who has not yet completed his audit of the Accounts for the year ended 31st March, 1939.

A Summary Income & Expenditure Account for the year ending 31st March, 1939 and a Balance Sheet at that date appears in the Appendix to this Report.

FINANCIAL YEAR BEGINNING 1st APRIL, 1939.

The following particulars with regard to the financial year beginning 1st April, 1939 are set out :—

Expenditure of Catchment Board.

The following estimate of expenditure was adopted by the Board :—

1. Under the Land Drainage Act, 1930 :

	£	s.	d.
(a) Administration	22,592	7	5
(b) Works of Maintenance	19,692	0	0
(c) Improvement of existing works	60,600	0	0
(d) Execution of new works	15,600	0	0
(e) Contributions to Internal Drainage Boards	1,800	0	0
2. Expenditure and charges incurred before the passing of the Land Drainage Act, 1930			Nil.
	£120,284	7	5

Income of Catchment Board.

This expenditure was met from the following sources of revenue (apart from sundry small receipts) :—

- Government Grant.
- Precepts on Internal Drainage Boards.
- Precepts on County and County Borough Councils.

(a) Government Grant.

As has previously been reported a grant of 33 $\frac{1}{3}$ % is paid by the Government in respect of the expenditure incurred in carrying out the Main River Improvement Scheme.

During the year in respect of the Improvement Scheme the sum of £24,530 13s. 4d. was estimated to be received by way of grant. Instalments of grant amounting to £99,595 have been received in respect of expenditure to 30th September, 1939, of £298,695.

(b) Contributions by Internal Drainage Boards.

It is laid down in the Land Drainage Act, 1930, that a Catchment Board shall by resolution require each internal drainage board to make towards the expenses of the Catchment Board such contributions as the Catchment Board may consider to be fair.

It is clear that no hard and fast rules can be laid down as to what such contributions shall be in as much as the circumstances in each case vary so greatly.

The Board have now to deal with 55 internal drainage boards and a special Sub-Committee has devoted a considerable amount of time to considering each case separately on its merits. For the financial year beginning 1st April, 1939, contributions in all amounting to £5,285 have been required to be paid by the internal drainage boards.

Particulars of the individual amounts paid by each Board will be found in the Appendix to this Report.

(c) Contributions by County and County Borough Councils.

Section 20 of the Land Drainage Act provides that the expenses under the Act of a Catchment Board in so far as they are not met otherwise shall be paid to the Board by the Councils of Counties and County Boroughs which are situate within or extend into the Catchment Area in proportion to the rateable values of the hereditaments in such areas within the Catchment Area.

In the Appendix to this Report appears a Statement of the totals of the rateable values at 1st April, 1939, of all such hereditaments in the respective areas of those Councils as are situate within the Catchment Area, together with the amounts payable in respect of Precepts for the financial year beginning on that date.

The aforesaid estimated expenditure of £120,284 7s. 5d. was raised from the above three sources as follows :—

	£	s.	d.
Government Grant	24,530	13	4
Precepts on Internal Drainage Boards	5,285	0	0
Precepts on County and County Borough Councils	90,468	14	1
	£120,284	7	5

CONTRIBUTIONS TO INTERNAL DRAINAGE BOARDS.

Section 21 (3) of the Land Drainage Act, 1930, provides that where it appears to an internal drainage board that by reason of the quantity of water which their district receives from lands at a higher level or by reason of the time which will elapse before their district obtains any relief from the operations of the Catchment Board on the main channel of the river, it is fair that a contribution towards their expenses should be made by the Catchment Board they may make an application to the Catchment Board and that Board may resolve to make to them such contribution, if any, as may be specified in the resolution.

During the year applications from 27 internal drainage boards have been received for contributions and to enable the Board to deal with them a great deal of information has had to be considered and checked. As in the case of precepts on internal drainage boards individual consideration has been given to each application and a total sum of £1,708 has been paid to the various boards. Particulars of these payments will be found in the Appendix to this Report.

BORROWING BY INTERNAL DRAINAGE BOARDS.

During the year the following internal drainage boards made application to the Ministry for sanction to borrow the amount stated opposite their names for the purposes of execution of works in their district.

In every case the Board having first reported thereon the Ministry approved thereof :—

Name of Board.	Amount sanctioned to be borrowed.	Period in which loan to be repaid.
Acaster Internal Drainage Board.	£221	One year.
Airmyn Internal Drainage Board.	£1,000	Two years.
Cliffe Internal Drainage Board.	£1,000	One year. (Extension of period).
Cod Beck Internal Drainage Board.	£300	Four years.
Ouseburn Internal Drainage Board.	£500	Two years.
Rye Internal Drainage Board.	£1,750	Three years.
Snaith Internal Drainage Board.	£150	Three years.
Went Internal Drainage Board.	£3,000	Two years.
West Derwent Internal Drainage Board.	£1,000	Two years.

HOSPITAL CONTRIBUTIONS.

Under the voluntary system suggested by the Board's workmen whereby a deduction is made from their wages for hospital purposes the sum of £126 10s. 7d. has been so deducted during the year ending 31st March, 1939. During the year the men elected to become contributors to the Leeds and District Workpeople's Hospital Fund instead of contributing to individually named hospitals. The contribution now made is 2d. per week and in return the men enjoy free hospital treatment for themselves and members of their families.

Section VI.—MISCELLANEOUS.

CATCHMENT BOARDS' ASSOCIATION.

The Catchment Boards' Association which has now been joined by 37 Boards continues to function with increased usefulness and is admirably fulfilling the purposes for which it was established and the Board through its representatives have continued to take an active part in its deliberations and in shaping its policy.

The Board re-appointed its existing representatives on the Association, namely, the Chairman (County Alderman R. L. Walker), the Vice-Chairman (Alderman E. Cruikshanks) and the Chairman of the Finance Committee (Alderman C. W. Beardsley).

The Annual Meeting of the Association was held on the 16th day of May, 1939, when Lt. Col. A. P. Heneage, D.S.O. D.L., M.P., was re-appointed President.

The meeting was addressed by the Minister of Agriculture and Fisheries, Col. Sir Reginald Dorman-Smith, M.P., J.P., who delivered an inspiring Address reference to which has already been made on pages 3 and 4 of this Report.

FACTORIES ACT.

A close examination of the Factories Act, 1937, which came into force on the 1st July, 1938, has been made with a view to the discovery of any provisions which might affect the operations of the Catchment Board, when it was found that a matter of considerable doubt appeared to exist as to whether the definition of "works of engineering" therein would embrace any works of the Catchment Board.

It was important to know whether this was so on account of the provisions of Section 108 (2) which reads as follows:—

"The provisions of this Act in their application to works of engineering construction shall have effect as if any place where such works are carried on were a factory, and any person undertaking any such works to which this Act applies were the occupier of the factory, and with such other adaptations and modifications as may be made by regulations made by the Secretary of State."

Included in the definition of "works of engineering construction" is "the construction, structural alteration or repair ... of any ... inland navigation."

The phrase "inland navigation" is not defined in the Act but on the assumption that it means an inland waterway on which there are statutory navigation rights it appeared to the Board that in as much as there were several lengths of their main rivers upon which statutory navigations existed it might be ruled that works they were carrying out in the channels or on the banks thereof might be regarded as the "repair of an inland navigation" and therefore works of engineering construction so that the place where they were being carried out was a factory within the meaning of the Act.

In order that a ruling might be obtained for the benefit of all Catchment Boards the matter was referred to the Catchment Boards' Association who willingly took the matter up with the Home Office from whom eventually a letter was received to the effect that while the Secretary of State had no authority to give legally binding decisions on questions of interpretation, in his opinion the construction, structural alteration or repair of any part of the area of a Catchment Board which was an inland navigation would be a work of engineering construction within the terms of the definition of the Act.

As a result of this ruling conferences have been held with local Factory Act Inspectors with a view to ascertaining their requirements in the matter and the display and serving of any notices that may be necessary, and otherwise to comply with the Act.

MINISTRY OF HEALTH INQUIRIES.

The following cases of applications to the Ministry of Health for sanction to borrow monies have been investigated with a view to seeing that land drainage interests would not be injuriously affected by the works proposed to be carried out.

Name of Authority.	Purpose for which borrowing powers required.
Batley Town Council.	Works of water supply.
Chesterfield Rural District Council.	Works of sewerage.
Conisbrough Urban District Council.	Works of sewage disposal.
Dewsbury County Borough Council.	Works of water supply.
Doncaster and Tickhill Joint Water Board.	Works of water supply.

Name of Authority.	Purpose for which borrowing powers required.
Filey Urban District Council.	Works of sewage disposal.
Hebden Royd Urban District Council.	Works of refuse disposal.
Helmsley Rural District Council.	Works of sewage disposal.
Hemsworth Rural District Council.	Works of sewage disposal.
Knottingley Urban District Council.	Works of sewerage and sewage disposal.
Mexborough Urban District Council.	Works of water supply.
Mirfield Urban District Council.	Works of sewage disposal.
Northallerton Rural District Council.	Works of sewage disposal.
Pickering Urban District Council.	Works of water supply.
Pudsey Town Council.	Works of sewage disposal.
Scarborough Rural District Council.	Works of sewage disposal.
Stokesley Rural District Council.	Works of sewage disposal.
Wakefield Rural District Council.	Works of sewage disposal.
Wharfedale Rural District Council.	Works of sewage disposal.

In every case where necessary, representations to the Local Authority have been sent and suggestions made in the interests of land drainage and in each case have been met.

IN THE COURT OF THE RAILWAY & CANAL COMMISSION.

It is the practice of the Court of the Railway & Canal Commission to direct that notices of any application to work coal shall be served upon a Catchment Board in the area in which the coal is situated.

During the year the following applications have been received and investigated :—

(a) The Grassmoor Company Ltd.

This Company made an application to the Court for a right to work coal under a housing estate almost wholly built over at Hasland in the Borough of Chesterfield.

(b) Earl Fitzwilliam's Collieries Company.

This was an application to work coal in the townships of Hoyland Nether, Wombwell, Brampton Bierlow, Wentworth, Greasborough, Rawmarsh, Wath-upon-Deerne, West Melton and Swinton.

Both cases were investigated but as in neither case as far as could be seen would land drainage interests be injuriously affected by the proposed abstractions of coal no further action was taken.

TOWN & COUNTRY PLANNING.

The Board has continued its policy of carefully watching all town planning schemes with a view to ensuring where possible that areas liable to flooding are zoned as open spaces.

For the most part they are glad to report that any recommendations they have made to Town Planning Authorities in this matter have been acted upon and only in one case have the Board found themselves at direct variance with the town planning authority. This was the case of the Ilkley Urban District Council who declined to accept the suggestion of the Board that certain areas in the Urban District which they had included in the Town Planning Scheme as suitable for building purposes should be removed from that category and left unbuilt upon.

The Board therefore communicated their views to the Minister of Health and on the 21st June a public Local Inquiry was conducted by one of his Inspector's when an opportunity was afforded the Board of supporting their views.

Evidence was given at the Inquiry that twice within recent years the lands in question had been flooded to a depth varying from 2 ft. to 4 ft. ; photographs showing some of the areas actually under flood water were handed to the Inspector and evidence was given by local residents who were eye witnesses of the flooding alleged. The Board await with interest the Minister's decision in the matter.

By way of contrast it is pleasant to be able to report that in the case of the Wetherby Rural District Council when it was pointed out to them that certain areas dealt

with by the Scheme were liable to flooding they adopted the whole of the Catchment Board's recommendations with regard thereto.

Two Town Planning Schemes, namely, the Alwoodley and Roundhay, and East Central promoted by the Leeds City Council were also examined but it was found that land drainage interests would not be injuriously affected in any way.

Schemes promoted by the North Riding County Council in relation to the following districts :—

- Helmsley Rural District.
- Kirbymoorside Rural District.
- Malton Urban District.
- Malton Rural District.
- Pickering Urban District.
- Pickering Rural District.

have also been examined when it was found that most of the areas liable to flooding had been scheduled in the draft schemes with an entire veto from building thereon in accordance with the information previously furnished to the Authority by the Board. The greater part of the remaining area which had been indicated as liable to flooding had been scheduled for agricultural development which allowed a building density of not more than one house per 10 acres. A few small areas, notably the villages of Brawby, Marton and Sinnington had on occasions been flooded but were not shown under the Building Restricted Schedule on the draft scheme. The villages were shown under the General Residential classification, but the land in the immediate vicinity of the village upon which any development would take place had been put in a special class with a present temporary building restriction, the development of the land finally depending upon the issue of a General Development Order by the Planning Authority. Under this class any immediate development of any nature has to be submitted to the Planning Authority for their approval.

APPENDIX.

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MEMBERS OF THE CATCHMENT BOARD, 1938-39.

Name and Address.	Person or Body Appointing.
1. Cty. Coun. A. R. Bailey,	West Riding County Council 14, Princess Street, Woodlands, Doncaster.
2. Coun. F. Barraclough, 25, Dorset Mount, Leeds, 8.	Leeds City Council.
3. Ald. C. W. Beardsley, 96, Bent's Road, Ecclesall, Sheffield, 11.	Sheffield City Council.
4. Ald. Lt.-Col. E. J. Clarke, "Parkfield," 22, Park Crescent, Leeds, 8.	Leeds City Council.
5. Robert Clive, Esq., Tankersley Grange, near Barnsley.	South Yorkshire Coal Trade Association.
6. Coun. R. Colver, 239, Graham Road, Sheffield.	Sheffield City Council.
Cty. Coun. A. Corfield, 182, Castleford Road, Normanton.	West Riding County Council.
7. R. H. Coulman, Esq., The Hall, Eastoft, Scunthorpe, Lincs.	Minister of Agriculture and Fisheries.
8. Ald. E. Cruikshanks, (Vice-Chairman), "Conway," Old Wortley Road, Rotherham.	Rotherham Town Council.
9. Capt. P. R. Davies-Cooke, Skellow Hall, Doncaster.	Minister of Agriculture and Fisheries.
10. W. T. Everatt, Esq., Faircote, Parker Lane, Mirfield.	West Riding County Council.

MEMBERS OF THE CATCHMENT BOARD—Continued.

Name and Address.	Person or Body Appointing.
11. C. W. H. Glossop, Esq., Bramwith Hall, Doncaster.	Minister of Agriculture and Fisheries.
12. Coun. J. Guest, 4, Queens Way, Queen's Drive, Barnsley.	Barnsley Town Council.
13. Cty. Coun. A. E. Hall, The Limes, Eckington, via Sheffield.	Derbyshire County Council.
14. Coun. J. Hargrave, 23, Howe Hill Road, York.	York City Council.
15. W. Hinchcliff, Esq., Grange Farm, Hunmanby, nr. Filey.	Minister of Agriculture and Fisheries.
16. Coun. N. Hutchinson, 150, Stanley Road, Wakefield.	Wakefield City Council.
17. Coun. L. Jessop, 152, Horton Grange Rd., Bradford.	Bradford City Council.
18. Ald. F. Austin Leach, 36, Reservoir Road, Halifax.	Halifax Town Council.
19. Coun. J. Lennon, Belle Vue Cottage, Thackley, Bradford.	Bradford City Council.
20. A. Penty, Esq., The Gables, Burneston, Bedale, Yorks.	North Riding County Council
21. Cty. Ald. J. H. Preston, Flasby Hall, Gargrave, Skipton, Yorks.	West Riding County Council.
22. Capt. E. A. Raimes, Acaster Manor, York.	West Riding County Council.

MEMBERS OF THE CATCHMENT BOARD—Continued.

Name and Address.	Person or Body Appointing.
23. Cty. Coun. Lt.-Col. H. Rhodes, Oaklands, Whixley, York.	West Riding County Council.
24. Col. P. Saltmarshe, Saltmarshe, Howden, E. Yorks.	Minister of Agriculture and Fisheries.
25. Cty. Ald. G. Schofield, Harrington Villa, 51, Park Road, Mexborough, Rotherham.	West Riding County Council
26. A. R. Thomlinson, Esq., Hall Cross Chambers, Doncaster.	Mineral Owners Association.
27. T. P. Thompson, Esq., Scurff Hall, Drax, Selby.	Minister of Agriculture and Fisheries.
28. Cty. Ald. W. H. Turner, Fairhaven, Wood Lane, Rothwell Haigh, Nr. Leeds.	West Riding County Council.
29. Cty. Ald. R. L. Walker, (Chairman), Boothferry House, Airmyn, Goole.	West Riding County Council.
30. Cty. Coun. M. Whittock, 46, Front Street, Glasshoughton, Castleford.	West Riding County Council.
31. W. Wood, Esq., Flaxton, York.	Minister of Agriculture and Fisheries.
32. Coun. F. Wrigley, "Thorsgrif," Somerset Road, Huddersfield.	Huddersfield Town Council.
33. Cty. Ald. Col. E. York, Hutton Hall, Long Marston, York.	West Riding County Council.

SCHEDULE OF PROPERTIES

In addition to the properties vested in or acquired by the Board which were included in previous Annual Reports the following additional properties have been purchased or acquired during the year :—

Situation.	Area			Purpose for which acquired.
	a.	r.	p.	
RIVER DERWENT.				
Barmby-on-the-Marsh.	0	0	34	Re-construction of embankment.
do.	0	1	38	do.
do.	0	0	31	do.
do.	1	0	23	do.
do.	0	0	25	do.
do.	1	2	1	do.
do.	0	0	20	do.
do.	0	1	27	do.
Sutton-on-Derwent and Elvington.	3	1	0	Taken in exchange for new channel.
South Duffield and Wressell.	2	0	34	do.
North Duffield and Bubwith.	1	3	16	do.
RIVER DON.				
Stainforth.	1	2	34	Construction of new cuts and setting back of flood embank- ments.
Fishlake.	0	0	16	do.
do.	3	2	24	do.
do.	0	1	4	do.
Stainforth.	5	1	6	do.
do.	1	3	5	do.
do.	19	0	20	do.
Fishlake and Stain- forth.	6	2	24	do.
Stainforth.	2	2	19	do.
Fishlake.	1	2	34	Widening river and construction of new flood embankments.
Thorne.	0	1	18	do.
Fishlake.	3	3	30	do.
do.	2	3	21	do.
Rawcliffe.	6	3	24	Widening existing channel.
Airmyn.	3	2	34	Re-construction of embankment.
do.	1	1	25	do.
do.	1	2	12	do.
RIVER OUSE.				
Wistow.	1	0	0	Acquisition of spoil in connection with construction of embank- ment.
do.	2	3	16	do.
do.	6	1	34	Construction of embankment.

INTERNAL DRAINAGE DISTRICTS
wholly or partly within the Catchment Area.

Name of District.	Act under which constituted.	District Drains to River	Area.		Annual Value.		
			Acres.	£ s. d.	Agri-cultural Land.	Other hereditaments (rated at one-third Annual Value).	Total Annual Value for rating purposes.
Acaster	Under West Riding of Yorks. County Council (Drainage Act) 1923.	Ouse & Wharfe	3245	3685 15 0	2117 0 0	4391 5 0	
Adlingfleet and Whiffitt (part)	Under Act of Parliament dated 1767.	Ouse	1469	2804 0 0	342 0 0	2918 0 0	
Ainsty	Under Land Drainage Act 1930.	Nidd	5370	5513 10 0	727 0 0	5755 16 8	
Airedale	Under Act of Parliament dated 1861.	Aire	2905	5746 4 0	24960 5 0	14066 5 8	
Airmyn	Under West Riding of Yorks. County Council (Drainage Act) 1923.	Ouse and Dutch River	2310	4379 0 0	3163 0 0	5433 6 8	
Aldborough	Under West Riding of Yorks. County Council (Drainage Act) 1923.	Ure	1680	1535 0 0	236 5 0	1613 15 0	
Appleton Roebuck and Copmanthorpe	Under Land Drainage Provisional Confirmation (No. 1) Act, 1922.	Wharfe	4711	5054 0 0	7020 0 0	7394 0 0	
Bedale	Under Land Drainage Act, 1930.	Swale	5362	4477 0 0	200 0 0	4677 10 0	
Bellaisize	Under Land Drainage Acts, 1861 and 1918.	Ouse	1153	1231 0 0	911 0 0	1534 13 4	

8

Name of District.	Act under which constituted.	District Drains to River	Area.		Annual Value.		
			Acres.	£ s. d.	Agri-cultural Land.	Other hereditaments (rated at one-third Annual Value).	Total Annual Value for rating purposes.
Bishopsoil	Under Act of Parliament dated 1767 and under Land Drainage Act, 1930.	Ouse	6655	4425 0 0	3662 2 6	5645 14 2	
Black Drain	Under Doncaster Drainage Act, 1929.	Dutch River	4223	3749 11 8	13569 15 0	8272 16 8	
Cliffe	Under Land Drainage Act, 1930.	Ouse & Derwent	5330	7313 15 0	7107 5 0	9682 16 8	
Cod Beck	Under Land Drainage Act, 1930.	Swale	3939	4687 10 0	1837 10 0	5300 0 0	
Cowick	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Don	2702	2233 10 0	2902 7 6	3200 19 2	
Dearne & Dove	Under Land Drainage Act, 1930.	Dearne	5300	2522 0 0	21786 0 0	9784 0 0	
Dempster.	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Ouse and Dutch River	2696	3796 10 0	3046 10 0	4812 0 0	
Dun	Under Act of Parliament dated 1873.	Don	14500	12427 0 0	84300 15 0	40527 5 0	
Dunsforth	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Ure	1184	1432 11 0	333 0 0	1543 11 0	

Name of District.	Act under which constituted.	District Drains to River	As at 1st April, 1939.									
			Area.	Agri-cultural Land.		Other hereditaments (rated at one-third Annual Value).		Total Annual Value for rating purposes.				
				Acres.	£	s.	d.		£	s.	d.	
Earby & Salterforth	Under Land Drainage Act, 1930.	Aire	574	833	15	8	278	19	6	926	15	6
East Derwent	Under Land Drainage Act, 1930.	Derwent	10838	8761	15	0	5336	10	0	10540	11	8
Fishlake	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Don	3150	2202	1	0	2253	5	0	2953	2	8
Goole Fields	Under Act of Parliament dated 1889.	Ouse	2643	3987	0	0	607	0	0	4189	6	8
Gowdall	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Aire	1664	1322	5	0	1835	0	0	1933	18	4
Greenoak	Under Land Drainage Acts, 1861 and 1918.	Ouse	1383	1318	10	0	127	0	0	1360	16	8
Hatfield Chase Corporation (part)	Under Act of Parliament dated 1862.	Dutch River	871	741	0	0	395	0	0	872	13	4
Holbeck	Under Land Drainage Act, 1930.	Ure	530	(Valuation not completed).								
Howden	Under Land Drainage Acts 1861 and 1918.	Ouse	3518	3024	5	0	1936	10	0	3669	15	0

Name of District.	Act under which constituted.	District Drains to River	As at 1st April, 1939.									
			Area.	Agri-cultural Land.		Other hereditaments (rated at one-third Annual Value).		Total Annual Value for rating purposes.				
				Acres.	£	s.	d.		£	s.	d.	
Knottingley to Hensall	Under Doncaster Drainage Act, 1929.	Aire	5806	5397	0	0	34288	0	0	16826	0	0
Lower Aire	Under Land Drainage Act, 1918.	Ouse and Aire	18700	18064	5	0	18875	10	0	24356	1	8
Lower Swale	Under Land Drainage Act, 1930.	Swale	8198	8171	15	0	1994	5	0	8836	10	0
Marston Moor	Under Land Drainage Act, 1930.	Ouse	11741	15397	18	2	24459	0	0	23550	18	2
Muston and Yedingham	Under Act of Parliament dated 1800.	Derwent	18194	13797	10	0	3003	15	0	14798	15	0
North Wharfe	Under Land Drainage Act, 1930.	Wharfe	4371	4323	15	0	359	15	0	4443	10	0
Ouse and Derwent	Under Act of Parliament dated 1854.	Ouse	31283	30196	5	0	68728	0	0	53105	5	0
Ouseburn	Under Land Drainage Act, 1930.	Ouse	3551	2767	17	6	1597	5	0	3300	5	10
Rawcliffe	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Aire and Dutch River	2700	3559	0	0	11579	0	0	7418	13	4
Reedness and Swinefleet	Under Act of Parliament dated 1884.	Ouse	4877	10390	0	0	2575	10	0	11248	10	0

Name of District.	Act under which constituted.	District Drains to River	As at 1st April, 1939.			
			Area		Annual Value.	
			Acres.	£ s. d.	Agri-cultural Land. £ s. d.	Other hereditaments (rated at one-third Annual Value). £ s. d.
River Crimple	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Nidd	1502	1562 7 0	129 0 0	1605 7 0
River Foss	Under Land Drainage Act, 1930.	Ouse	20000	19980 2 6	27813 12 0	29251 6 6
River Kyle	Under Land Drainage Acts, 1861 and 1918.	Ouse	20172	16780 15 0	2572 10 0	17638 5 0
River Tutt	Under West Riding of Yorks. County Council (Drainage) Act, 1923.	Ure	1559	1702 15 0	225 15 0	1778 0 0
River Wiske	Under Land Drainage Act, 1930.	Swale	9103	8327 10 6	3419 3 0	9467 14 10
Rye	Under Land Drainage Act, 1930.	Rye & Derwent	30470	27513 5 0	9935 18 3	30825 4 5
Selby Dam	Under Act of Parliament dated 1885.	Ouse	14500	13263 8 0	17510 2 0	19100 2 0
Snaith	Under Doncaster Area Drainage Act, 1929.	Aire	950	972 5 0	5183 11 0	2700 2 0
South Wharfe	Under Land Drainage Act, 1930.	Wharfe	5473	6044 0 0	8859 10 0	8997 0 0

Name of District.	Act under which constituted.	District Drains to River	As at 1st April, 1939.			
			Area		Annual Value.	
			Acres.	£ s. d.	Agri-cultural Land. £ s. d.	Other hereditaments (rated at one-third Annual Value). £ s. d.
Sykehouse	Under Land Drainage Act, 1930.	Don	2775	1642 0 0	1806 0 0	2244 0 0
Thornton	Under Land Drainage Act, 1930.	Derwent	12970	13755 19 0	2597 0 0	14621 12 4
Thornfree	Under Doncaster Drainage Act, 1929.	Dutch River	1824	2807 10 0	833 10 0	3085 6 8
Upper Swale	Under Land Drainage Act, 1930.	Swale	7150	7334 0 0	733 10 0	7578 10 0
Went	Under Act of Parliament dated 1831 and Land Drainage Act, 1930.	Don	19100	14495 15 0	27958 5 0	23815 3 4
West Derwent	Under Land Drainage Act, 1930.	Derwent	13140	11557 0 0	7132 0 0	13934 6 8
West Haddlesey	Under Land Drainage Act, 1930.	Aire	5300	6549 0 0	2016 0 0	7221 0 0
Wilberfoss and Thornton Level	Under Land Drainage Act, 1861.	Derwent	8200	6781 15 0	3622 10 0	7989 5 0
Wistow, Cawood and Selby	Under Land Drainage Act, 1918.	Ouse	5700	8280 15 0	7091 10 0	10644 11 8

COUNTIES AND COUNTY BOROUGHS
within the CATCHMENT AREA.

**Statement of Rateable Values at 1st April, 1939, and amounts payable
in respect of Precepts for the financial year beginning on that date.**

County or County Borough.	Total rateable value at 1st April, 1939 of hereditaments within the Catchment Area.	Adjusted Precept for the financial year beginning 1st April, 1939.
County Council of :—	£	£ s. d.
Chester	Nil.	— — —
Derby	803,539	3,318 5 10
Lancaster	7,637	31 10 9
Lincoln (Parts of Lindsey)	Nil.	— — —
Nottingham	1,092	4 10 2
Westmorland	Nil.	— — —
York, East Riding	133,890	552 18 3
York, North Riding	550,646	2,273 18 11
York, West Riding	7,013,030	28,960 19 8
County Borough of		
Bradford	2,195,371	9,065 19 11
Huddersfield	967,480	3,995 6 1
Leeds	3,792,882	15,663 1 5
Sheffield	3,335,360	13,773 13 10
York	666,888	2,753 19 7
Halifax	617,140	2,548 10 9
Wakefield	379,278	1,566 5 3
Dewsbury	329,003	1,358 13 0
Doncaster	302,764	1,250 5 10
Barnsley	376,001	1,552 14 8
Rotherham	435,396	1,798 0 2
	21,907,397	90,468 14 1

INTERNAL DRAINAGE BOARDS.

STATEMENT OF AMOUNTS precepted for the
financial year beginning 1st April, 1939.

Name of Board.	Amount
Acaster	£
Adlingfleet and Whitgift	46
Ainsty	24
Airedale	75
Airmyn	200
Aldborough	106
Appleton Roebuck and Copmanthorpe	13
Bedale	60
Bellasize	29
Bishopsoil	13
Black Drain	57
Cliffe	65
Cod Beck	101
Cowick	33
Dearne and Dove	54
Dempster	121
Dun	64
Dunsforth	420
Earby and Salterforth	13
East Derwent	4
Fishlake	112
Goole Fields	38
Gowdall	35
Greenoak	16
Hatfield Chase Corporation	11
Howden	—
Knottingley to Hensall	38
Lower Aire	141
Lower Swale	251
Marston Moor	70
Muston and Yedingham	188
North Wharfe	126
Ouse and Derwent	28
Ouseburn	539
Rawcliffe	49
Reedness and Swinefleet	62
River Crimble	102
River Foss	13
River Kyle	292
River Tutt	151
River Wiske	7
Rye	97
Selby Dam	324
Snaith	156
South Wharfe	28
Sykehouse	54
Thornton	23
Thorn tree	124
Upper Swale	46
Went	74
West Derwent	167
West Haddlesey	186
Wilberfoss and Thornton Level	61
Wistow, Cawood and Selby	67
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INTERNAL DRAINAGE BOARDS.

STATEMENT OF CONTRIBUTIONS made by the
Catchment Board during the financial year beginning
1st April, 1939.

Name of Board.	Amount
Ainsty Internal Drainage Board	28
Bedale Internal Drainage Board	36
Bishopsoil Internal Drainage Board	5
Black Drain Drainage Board	30
Cod Beck Internal Drainage Board	65
Dearne and Dove Internal Drainage Board	148
Dun Drainage Commissioners	128
Muston and Yedingham Internal Drainage Board	135
North Wharfe Internal Drainage Board	22
River Foss Internal Drainage Board	307
River Kyle Internal Drainage Board	212
River Tutt Internal Drainage Board	34
River Wiske Internal Drainage Board	261
Rye Internal Drainage Board	81
Thornton Internal Drainage Board	17
Upper Swale Internal Drainage Board	28
Went Internal Drainage Board	63
Wilberfoss and Thornton Drainage Board	108
	£1,708

INTERNAL DRAINAGE BOARDS.

Statement of Rates levied.

Drainage Board.	Year ending 31st March, 1939.		Year ending 31st March, 1940.		Remarks
	s.	d.	s.	d.	
Acaster	
Adlingfleet and Whitgift—	
Whitgift (Ouse Area)	6	1 8	6	1 8	
Adlingfleet (Trent Area)	1 0	1 3	1 0	1 0	
Ainsty	6	—	4	—	
Airedale	2	6	1	0	
Airmyn	3	6	3	6	
Aldborough	3	9	6	3	
Appleton Roebuck and Copmanthorpe	6	0	3	0	
Bedale	2	6	2	2	
Bellasize	2	0	2	0	
Bishopsoil	2	0	1 6	2 0	
Black Drain	2	9	1 9	1 0	
Cliffe	1	11	1 3	7 $\frac{1}{2}$	
Cod Beck	9	1 3	9	1 3	
Cowick	1	0	1 0	0	
Dearne and Dove	2	3	1	0	
Dempster	2 $\frac{1}{2}$	0	2 $\frac{1}{2}$	0	
Dun	3	0	—	—	
Dunsoth	1	5	1	6	
Early and Salterforth	2	4	3	3	
East Derwent	3	6	3	6	
Fishlake	2	10	2	8	
Goole Fields	2	2	2	2	
Gowdall	2	6	2	6	
Greenoak	2	—	—	—	
Hafield Chase Corporation (Part)	3	6	3	6	
Holbeck	—	—	—	—	
Howden	—	—	—	—	
Knottingley to Hensall	6	—	6	—	

1938/9 rate covers 2 years to 31st March 1939.

INTERNAL DRAINAGE BOARDS.

Statement of Rates levied—continued.

Drainage Board.	Year ending 31st March, 1939.		Year ending 31st March, 1940.		Remarks
	s.	d.	s.	d.	
Lower Aire	3	4	3	9	
Lower Swale	—	—	1	0	
Marston Moor	3	9	6	6	
Muston and Yedingham	2	0	3	0	
North Wharfe	2	10	2	1	
Ouseburn	6	6	9	9	
Ouse and Derwent	6	7	6	7	
Rawcliffe	3	9	6	9	
Reedness and Swinefleet	1 $\frac{3}{4}$	6	2	6	
River Crimple	2	3	2	3	
River Foss	1	0	1	0	
River Kyle	—	—	1	0	
River Tutt	1	9	—	—	
River Wiske	1	4	1	9	
Rye	—	—	1	0	
Selby Dam	2	3	7	1	
Snaith	1	0	3	5 $\frac{1}{2}$	
South Wharfe	6	6	4	10	
Sykehouse	3	0	3	0	
Thornton	2	3	2	3	
Thornthorpe	3	9	3	6	
Upper Swale	—	—	—	—	
Went	8	1	2	1	
West Derwent	2	2	4	2	
West Haddlesey	3	9	2	1	
Wilberfoss and Thornton Level	6	1	6	1	
Wistow, Cawood and Selby	—	—	—	—	

† To be levied in March, 1940.

SUMMARY INCOME and EXPENDITURE ACCOUNT

EXPENDITURE	£	s.	d.	£	s.	d.
To Balance overspent brought forward—						
Maintenance	2,117	2	7			
Improvement	3,872	7	9	5,989	10	4
Expenditure in Year—						
Administration—						
New Offices	31,158	4	4			
General	12,886	8	9			
	44,044	13	1			
Maintenance	20,961	19	8			
Improvement	44,368	12	0			
New Works	17,208	12	0			
Contributions to Internal Drainage Boards	1,838	0	0			
	128,421	16	9			
Balance in hand carried forward—						
Administration—						
General	891	13	11			
Maintenance	1,375	5	5			
Improvement	3,192	17	0			
New Works	950	14	10			
Contributions to Internal Drainage Boards	32	7	5	6,442	18	7
	140,854	5	8			

for the Year ending 31st March, 1939.

INCOME.	£	s.	d.	£	s.	d.
By Balance in hand brought forward—						
Administration—						
New Offices	17,234	3	9			
General	102	4	9			
	17,336	8	6			
New Works	3,131	5	5			
Contributions to Internal Drainage Boards	370	7	5	20,838	1	4
Income in year—						
Administration—						
New Offices	12,568	0	4			
General	13,500	0	0	175	17	11
Maintenance	20,750	0	0	3,704	7	8
Improvement	35,400	0	0	16,033	16	9
New Works	9,350	0	0	5,678	1	5
Contributions to Internal Drainage Boards	1,500	0	0			
	93,068	0	4	25,592	3	9
	118,660	4	1			
Balance overspent carried forward—						
Administration—						
New Offices				1,356	0	3
				140,854	5	8

BALANCE SHEET at

LIABILITIES.	£	s.	d.
CAPITAL ACCOUNT.			
Revenue Contributions for Capital Assets	130,732	1	8
REVENUE ACCOUNT.			
Sundry Creditors	462	1	1
Commissioners of Inland Revenue	13	10	0
	475	11	1
Income and Expenditure Account	5,086	18	4
Excavators—			
Maintenance	335	3	5
	5,422	1	9
	5,897	12	10
	£ 136,629	14	6

31st MARCH, 1939.

ASSETS.	£	s.	d.	£	s.	d.
CAPITAL ACCOUNT.						
Capital Assets (at cost)	130,732	1	8			
REVENUE ACCOUNT.						
Sundry Debtors—						
General	1,509	19	7			
Loans to Internal Drainage Boards	237	0	0			
Ministry of Agriculture and Fisheries	197	4	0			
	1,944	3	7			
Telephone Deposits		5	0			
Balances at Bank and in hand—						
Clerk's Imprest Account	103	1	9			
Wages Imprest Account	4,258	11	6			
General Account (Due Treasurer)	413	4	0			
	3,948	9	3			
	5,897	12	10			
	£ 136,629	14	6			

NOTE :—(4th March, 1940).
The audit of the foregoing Accounts by the District Auditor has not been carried out.