
"MISS WEAVER'S" RED LETTER DAY.

Anderton Lift Re-opened.

Fine Engineering Feat.

LINKING UP THE POTTERIES.

Sir. Jos. Verdin & Canal Development.

Wednesday was essentially and unquestionably a red-letter day in the history of the River Weaver Navigation—and probably in the history of inland navigation generally—for it marked the successful completion of an engineering feat which may probably play a great part in the development of this and kindred waterways. Just as the old hydraulic lift at Anderton marked an epoch and set a fashion in this particular form of engineering work, so the reconstructed lift, devised on a most ingenious and remarkably effective principle by Mr. J. A. Saner, M.I.C.E. (the engineer to the Trust), sets new ideas, conquers new fields, and makes for marked efficiency and ease of control and management. When it is remembered that by means of the Anderton Lift the Potteries is linked with the Weaver system, which in turn is connected with the Manchester Ship Canal and with Liverpool, the importance of any simplified and improved method of bodily conveying craft from one waterway to the other will be realized.

THE OPENING CEREMONY

on Wednesday was, consequently, a function of great importance. At 11.45 the party of invited guests boarded the barge "Miss Weaver" opposite the Weaver offices, the good little steamer "Water Fly" towing the precious charge to Anderton. Sir Joseph Verdin, D.L. (chairman of the finance and works committee of the trust), was, appropriately enough, chairman of the gathering, and the arrangements for the trip had been made with rare exactitude by Mr. E. S. Inman (the manager), Mr. J. A. Saner (the engineer), and the rest of the staff. Those present were representatives of the trade and commerce of three counties. They were as follows: Colonel George Dixon, chairman, Cheshire County Council; Dr D B Hewitt, vice-chairman, Weaver Navigation, and director, Brunner, Mond and Co., Ltd.; Messrs Chas Miller Crichton, director Salt Union, Ltd.; R B Dunwoody, joint secretary, Royal Commission on Canals; G R Jebb, Shropshire Union Canal Co.; J Watt Sandeman, Newcastle-on-Tyne; C Gordon

Thomas, Grand Junction Canal Co.; Lionel B Wells, Manchester; H Curbishley, North Staffordshire Canal Co.; C E Stromeier, Manchester Steam Users' Association; Dudley Parsons, assistant traffic superintendent, L. and N.-W. Ry., Liverpool; John Rigby, Weaver Trustee, chairman Mersey Weaver Carrying Co.; Walton Stanley, Hanley; Geo. Shipway, J.P., Birmingham Chamber of Commerce; Councillor G F Adcock, J.P., and Councillor Shirley, J.P. Hanley Corporation; Alderman Malkin and A. Bremner, Burslem Corporation; Councillor W B Hackney (Mayor) and Councillor Brooke, Stoke-on-Trent Corporation; George O Kent (town clerk), Longton Corporation; W J Yarwood, Northwich Urban District Council; J P Jackson, Winsford Urban District Council; T W Forster, Inland Carrying Trade, Liverpool; C W Shirley, Weaver Trustee, and C P Walker, Weaver Trustee, representing Pottery District; and the Press.

Arrived at Anderton, "Miss Weaver" was left for the time being, and the party boarded another large barge, which sailed into one of the lift basins. The passage thereto was "obstructed" by a red ribbon, which Sir Joseph Verdin cut, observing, amid applause, "I declare this lift to be open. The work has been skilfully and effectively done." Portions of the red ribbons were secured as mementoes, Mr. Saner handed to Sir Joseph a morocco-bound copy of his description of the reconstructed lift and history of the Weaver, and presented him with the scissors (library scissors) in a brass sheath.

In five minutes and 25 seconds from the time the machinery was started, the "voyage" to the top of the lift was accomplished—the old lift never did the journey in less than seven minutes—and then the engineer escorted the party on to the staging above, explaining the wonderful electrically-driven machinery operating the hoist.

THE NEW LIFT DESCRIBED

From the description, specially written by Mr. J. A. Saner, M.I.C.E., engineer to the trustees (the designer of the new lift), coupled with details supplied in an article to "The Engineer," we cull the following particulars regarding the old and the reconstructed lifts: The hydraulic lift at Anderton was opened in 1875, and since then there has been a continuous flow of traffic in bulk, greatly to the benefit of all concerned. This lift consisted of two tanks or caissons, supported on rams in equilibrium. One tank was

always up and the other down. When it was in use the boat and cargo were floated into one of the tanks above or below, or when convenient both contained boats. The gates closing the ends of the tanks were then closed, and the machine set in motion by withdrawing a small amount of water from the lower tank. The extra weight of the descending tank then caused them to change places, the ascending boat is

TRANSFERRED THROUGH 50FT.

to the canal and the descending boat to the river. A small hydraulic pump made up the losses by friction and other mechanical causes, but five-sixths of the transfer was performed by the slight difference in weight of water in the tanks. No possible straining could occur to the boat as it was kept afloat all the time. The weight of each tank including water and ironwork was 250 tons, which, of course, never changed; as the boat displaced its own weight of water. After working for nearly thirty years it was found that, like all other structures of a similar nature, considerable repairs were required, and more especially to the main rams, upon which the whole weight of 250 tons was balanced. It appears from the records that the lift gave no trouble for about ten years, except on one occasion when one of the presses burst. Signs then appeared in the main rams of grooving, and, as this extended, it was found difficult to keep the gland packings from being torn. In 1896, it was found that the grooving was increasing more rapidly than before, and certain parts of the rams were so much affected as to give rise to considerable anxiety. The corrosion was arrested for a time by abandoning the use of the canal water, which was impregnated with chemicals, and had set up an acute electrolytic action. A condensing plant was put down, light and power to lift the aqueduct and other gates being obtained from a small dynamo and battery. These arrangements worked satisfactorily until, in 1902, it was found unsafe to continue the use of the boilers, which had been in constant use since 1875. Electric pumping plant was then put down, and was more satisfactory and economical than steam. Still it was found more and more difficult to keep the rams sound, the hydraulic pipes watertight, and the structure safe. The seriousness of the situation was reported to the trustees by the engineer in August, 1904, and it was pointed out—Sir Benj. Baker being afterwards called in and confirming the view—that in the event of the reconstruction of the lifts having to be carried out on the existing site, the best way of giving effect to it would be to sling the caissons from the top and

ABANDON THE HYDRAULIC RAMS

altogether. It was most important not to in any way interrupt the flow of traffic between the river and the Potteries, and Mr. Saner undertook that if his proposals were adopted he would only ask for three stoppages of the lift, at different times of two weeks each—a promise he fulfilled with four days to spare. Briefly put, the project (which was begun in 1906) was to suspend the caissons by means of wire ropes on to an overhead arrangement of wheels and pulleys, with counterweights at the other end of the ropes, somewhat similar to the method of carrying an ordinary window sash. A clear idea of the principle may be given by assuming that a large number of window sashes are fastened securely together, each one having its own pulleys and counterweights. The essential difference, however, between the window frame and the arrangement at the lift is, that instead of forcing the windows "en bloc" up or down, the power is applied direct to the pulleys through suitable gearing, so that they are all made to revolve together, and thus raise or lower the mass. This did away entirely with the necessity of hydraulic power, as an electric motor was more convenient for operating the pulleys, and has the great advantage that all parts of the machinery are above ground and easily accessible, there being practically nothing which re-

quires attention except to see that the ropes are not stranding, in which case it is quite easy to renew them one at a time. The power of the motor is applied to the main pulleys as follows:—The motor runs at 750 revolutions per minute. This speed is reduced by means of an enclosed worm and wheel to 18 revolutions per minute. The worm wheel actuates a longitudinal shaft which conveys the power to two short cross shafts, making 12 revolutions per minute, placed at equal distances from the centre and from each end of the pulleys. By means of bevel wheels the worm wheel actuates two longitudinal shafts running the whole length—70ft.—and having pinions engaging with each pulley. The speed is by this gearing reduced to three revolutions per minute, and as the pinions are 12in. diameter and the wheels 6ft., there is a further reduction, so that the main pulleys only make one revolution in two minutes. Every pulley is therefore directly geared to the shafts, and as all the teeth are helical, there is an absence of noise and backlash, the humming of the electric motor only being noticeable. The placing of the cross shafts also ensures the simultaneous movement of the pulleys by equalising the torsion on the main shafting. Each caisson with the water in it

WEIGHS 252 TONS,

and whatever the size or weight of the boat, the aggregate does not vary, as, of course, the boat displaces its own weight of water. To counterbalance this means 252 tons of cast iron, which is divided into thirty-six groups of weights of seven tons each. Each group is suspended by an independent rope, passing over a 6ft. pulley, so that whatever the stretch of the rope may be, the latter can never be stressed to more than 7 tons plus the friction between rope and pulley. As nearly the whole length of the rope is hanging free when the caisson is at the top, any uneven stresses are relieved, and the rope starts afresh each time the caisson descends. The power required is therefore only that necessary to overcome the friction of the pulleys on their bearings and that due to other minor sources. Although the weight moved is approximately 570 tons, including the wheels, the actual power required is only half a Beard of Trade unit for the single stroke of 5ft., which is accomplished in from 5 to 5½ minutes, or, say, 8 horse power. The electricity is supplied on a sliding scale of cost varying from 2d. to 1d. per unit. The object of providing the large 30 horse-power motor was to allow for possible variations of water level, and it has been possible to work with a difference of 6in. in the level of water in the troughs, or an unbalanced load of more than 14 tons. This, however, is not needed in actual practice, as the joint at the river end of the caisson is made adjustable in case of floods or drought. The working ropes are merely laid on the pulleys, but in order to provide for an emergency, which might arise through a boat knocking out an end gate, a sufficient number of idle ropes are provided, which coil and uncoil on the larger pulleys, and would prevent any undue running away of the counterweights. The No. 1 side was at work without the slightest hitch by May 1st. It has already made over 2,500 strokes, and has passed all the traffic through, so that it is fair to say the capacity of the two separate caissons will in practice be at least double what it was under the old conditions. The lifts and gates are all operated from the house by means of electric controllers. The cost of the alteration will be, when

COMPLETE, ABOUT £25,000.

for which practically two lifts have been provided: but Mr. Saner is confident that if the work could be started on fresh ground, without interruption, this cost would be considerably reduced. His experience of this work fully confirms his evidence given before the Royal Commission on Waterways, both as to costs and as to the possibility of working the upper reaches

of canals without any loss of water, except by evaporation or accidental leakage. The new arrangement has the advantage of reducing the physical labour required of the man in charge of the controllers, as formerly he was obliged to remain at the valves all the time the caisson was at the joint, either easing the pressure or applying more, as either the accumulator or the caisson pressure became the greater. Now, as soon as the power is switched off, everything is at a standstill, and nothing moves until it is again applied. There will also be a small reduction in the labour required, as although since 1866, when electric power was applied for lifting the gates, there have only been three men in constant attendance, and one man for half time, two men will be actually required, namely, one above and one below. A third man will, however, have to be in attendance to act as waiting man in case of illness, and can be usefully employed assisting the boats in and out and oiling the machinery. One thing has also been proved, if proof were necessary, by the various alterations at Anderton, and that is, for a similar intermittent load electric power for driving hydraulic pumps is somewhat cheaper than steam, but when applied direct, and the hydraulic power eliminated, the cost is considerably less. For whereas the daily consumption of electricity at Anderton previous to the last alteration averaged about 118 units per diem, it has now been reduced to about one-half of this amount for doing exactly the same work. The alteration as a whole has given the advantages of quickening the time of transit and reducing the cost of power.

THE WEAVER AND ITS TRADE.

Mr. Saner had written for use at the re-opening of the lift a brochure on the Weaver and its trade, which space alone prevents us giving in extenso. It embodies portions of the foregoing description of the lift and the following: "The river Weaver was at one time a somewhat brackish and very tortuous stream running through the centre of Cheshire. No part of the Dane (the chief tributary), is at present navigable, although Parliamentary powers were long since obtained but never put into force. The area of the Weaver watershed, including the Dane, is 544 square miles, or nearly one-half the area of the county; the geological formation consists of the more recent formations overlying the new red sandstone, and contains the valuable salt-bearing Keuper Marls. Of the history of the river before its canalisation about 1730, there are few points of interest. There is ample evidence of the use by the Romans of the brine springs on its banks, especially at Northwich, and there is little doubt that small vessels took advantage of the flow of the tide to navigate the lower reaches; and if local tradition is to be trusted, the river played an important part

DURING THE CIVIL WARS

in King Charles the First's time. In King's "Vale Royal," published in 1656, the river is mentioned as having five bridges, and from the descriptions given in that book must have passed through what was then most charming scenery, which, however, has now been obliterated in places by the salt and chemical works erected on the banks. Long before any attempt was made to canalise the river, salt was carried down on the backs of men and horses to the vessels mentioned above as navigating at tide time; but in 1721 an Act was obtained, and although nothing was done until about 1730, it was then impounded by means of timber locks from Winsford to Pickersens-o'-th'-boat, a hamlet about six-and-a-half miles from the Mersey. This enabled vessels of from sixty to seventy tons burthen to navigate at spring tide; and about 1763, by means of a lock placed lower down at Erodsham, the navigation was open at all tides for these vessels. The navigable depth of the river was then 4ft. 6in. Improvements commenced with an Act in 1807,

in 1830 the locks were improved, and from 1860 to 1870 they were doubled, and the depth of navigation increased gradually to 9ft., so that vessels carrying from 250 to 300 tons were able to navigate. About this time trade was so good and improving, and the

INTRODUCTION OF STEAM

on the river had so increased the desire for rapid transit, that it was determined to further increase the facilities, and to make the locks of very much larger dimensions. The construction of the river in its present form was therefore commenced, and now not only can vessels with fixed masts navigate to about two miles above Northwich, or seventeen miles from the entrance to the Mersey, but trains of vessels carrying upwards of 1,000 tons be navigated and pass through the locks at one locking. The number of locks has also been reduced from nine in 1830 to four now, while the navigable depth is 10ft. 6in. for the whole twenty miles. The new locks are 220ft. by 42ft., and are built so as to allow the river to be dredged down to 16ft. There are most important auxiliary works at Weston Point and Anderton for the accommodation of the inland trade. It appears soon to have been found out, after the construction of the Trent and Mersey Canal, that it was commercially beneficial to tranship other goods in addition to salt at Anderton. So important does the interchange of traffic appear to have been, that in 1807 a clause for the protection of the canal was inserted in an Act of Parliament, prohibiting such interchange except as to salt and kindred goods. From 1825, when this was repealed as being "highly prejudicial to the public," a considerable interchange took place by means of inclined planes and cranes. Then the Anderton lift was opened. In connection with this

INLAND EXPORT

and import traffic are the docks at Weston Point. These were commenced also about 1860, and have been since extended so that with the lower portion of Weston Canal they form a considerable area for the accommodation of vessels bringing flints, china stone, bone ash, and other pottery materials, and are well fitted up with hydraulic and steam cranes, floating derricks, and other appliances for handling traffic. At Anderton there are also electric cranes, and at both places, which form the exits and entrances for the inland through trade of the river, are extensive sheds, warehouses, and wharves, so that rapid dispatch can be given. The size of the dock entrances and depth of water enable vessels up to 1,200 tons burthen to be dealt with. The permanent works of the trustees have now all been placed on sound ground except the two new swing bridges at Northwich, which were specially designed by Mr. Saner in order to meet the difficulty of subsidence. The bridges are balanced with their centre of gravity over the centre of a large circular pontoon or buoy which floats and carries about five-sixths of the whole weight, the remaining one-sixth resting on a ring of live rollers, supported by screw piles. When the bridge is turned the whole pontoon turns with it, so that friction is reduced to a minimum. Should any subsidence take place, the weight to be handled is comparatively small, and for ordinary unevenness the piles are provided with screw-heads by which the roller path can be adjusted. The whole is operated by electricity, and can be opened and closed in under four minutes, including the application of the gates for the safety of the public. These

BRIDGES ARE UNIQUE,

and were the first opening bridges to which electricity was applied as a motive power in the United Kingdom. In the early days of navigation the trade was of course very small in comparison with what it is now, though evidently of importance in the then conditions of commerce in the

country. The earliest record is 1732, which was the year the locks were first used, when the total traffic appears to have been 14,525 tons of salt; and the amount gradually increased, until the introduction of steam brine-pumps and deep mining, when it rapidly advanced until in 1881 it had reached the grand total of 1,466,917 tons of goods, salt, and merchandise carried down the river. This appears to have been a high-water mark, as since then the tonnage of salt has declined, and although there has been a very large increase in chemicals and inland pottery, grain, and other goods, the total figure for last year only amounted to 1,058,700 tons. It is impossible to conclude this brief description of the river without drawing attention to the possibility of

ITS FURTHER EXTENSION.

The question of improving the waterways of the country is, of course, now under consideration by a Royal Commission, and it is hoped that their report will not only stimulate a passing interest in such waterways, but will also lead to something being done to render them more suitable for modern requirements, on the lines of either this river or other similar navigations. Whatever may be eventually the ultimate outcome of any report which may be made by the Commission, Mr. Saner still adheres to the evidence which he gave before them in May, 1906, when he advocated the connection of the four ports, namely, Liverpool and London, Hull and Bristol, by means of enlarged waterways, carrying vessels of three hundred tons burthen, the construction of which would, without doubt, greatly benefit the trade of the country.

The day, it should have been mentioned, was positively ideal for a survey of the Weaver, and a trip remarkably enjoyable in every one of its aspects was entered upon right away from Winnington Bridge to Weston Point, the importance of the Weaver Works, as well as the beauty of the scenery being a revelation to the party en route.

LUNCHEON WAS SERVED

by the Misses Edwards, of the Angel Hotel, Northwich, and full justice was done to a fine repast. It was followed by an interesting toast list. After "The King," proposed by Sir Joseph Verdin (the chairman),

Col. Dixon proposed "The Weaver Navigation" ("Miss Weaver"), which he said had had its lights and shades. The Trust was a very old one, and he believed it was in 1721 that the Act was passed whereby the navigation was made. The three gentlemen who were the means of having the canal made were John Egerton, of Oulton; John Hampson, of Lees; and Richard Vernon, of Middlewich. These were gentlemen of Cheshire whose names should not be lost sight of, for they conferred an inestimable benefit upon the trade of the county and upon Cheshire itself. (Applause.) Those three gentlemen got other gentlemen in Cheshire to provide the funds, and the cost was £9,000 for the making of the Navigation from Frodsham to Winsford. The gentlemen who found the money were to get five per cent., with one per cent. for what was called the risk. As soon as the canal was made and everything was paid for, it was enacted that the revenue was from time to time to be employed for improving the roads and bridges of Cheshire, and such other purposes as the Justices of the Peace might direct. He now came to the shadows. For years a large amount was given to the county of Chester, which helped to pay the rates, and it was such a goodly sum that during the cattle plague in 1866 Mr. Gladstone, when asked to give compensation to Cheshire for the enormous number of cattle which were dying daily, said, "You have got the River Weaver; it is

YOUR CHESHIRE COW,

you can milk it as much as you like—(laughter)—that will do instead of compensation." This would show them what the undertaking was

in those days. Things had advanced and the Weaver had had to put in sidings and locks and make large expenditure, with which the trade had not been commensurate. They were still in hopes that trade would look up, and that they might have better times; but at present things were not in a satisfactory condition. They had just seen the new lift which Mr. Saner had put up, greatly to his credit—(applause)—they had seen for themselves how beautifully it was worked and how easily it was managed. He was hoping that they might now look for better times; they were all business men, and could judge for themselves whether the undertaking was such that they had confidence in. They might be sure, under the chairmanship of their friend, Sir Joseph Verdin, who had his eye upon everything, that the River Weaver would go on in its present condition if their funds would only allow. He coupled Sir Joseph's name with the toast. (Applause.)

Sir Joseph Verdin in reply said: On behalf of the trustee of the river Weaver Navigation, I thank you for the kind manner in which you have drunk this toast, and for the complimentary remarks Col. Dixon has made as to the river Weaver, which as an inland waterway is second only to the great Manchester Ship Canal, and the eminent engineer who constructed that canal gained valuable experience on the Weaver, as he was our engineer for many years, and his talented successor, Mr. Hunter, was also associated with this navigation. The constitution of the River Weaver Trust has changed during the last few years, but I venture to claim for the old trustees, as well as for the present trustees, that the promotion of the trade of the district has always been their first consideration. It is quite true that in the past considerable sums of money were paid over to the county of Chester in relief of the rates, but the river was then in line with the needs of the local trade requirements as it is to-day; but in building the new works our present debts were incurred, which we find somewhat burdensome, but notwithstanding, we have, as you have seen to-day, incurred indebtedness in order to meet the obligations which our geographical commercial position has placed upon us. The Anderton lift, which has been reorganised by our present engineer, Mr. Saner, is, I think you will agree with me, not only a very lofty monument to his skill and ingenuity, but also likely to be a great factor in developing the trade between the port of Weston Point and the county of Staffordshire, and it now only remains for the commercial genius of that county to utilise it to the fullest extent; and thus enable us to justify to ourselves and others the wisdom of the large expenditure we have made upon this undertaking. (Applause.)

Mr. G. R. Jebb (engineer to the Shropshire Union Canal Company) said as he and one or two others had to leave, he craved pardon for a moment that he might, in the name of all assembled, thank the Chairman personally for his kindness in giving them such an entertainment and affording them the opportunity of seeing so much of interest on the navigation. He knew Sir Joseph Verdin was present at considerable inconvenience to himself, and could not get home before midnight, but he said he was determined to see it out, and they were all indebted to him for his personal self-denial. He asked them to drink the health of the worthy Chairman and Mr. Inman, the manager of the Trust. (Applause.)

The toast was warmly honoured, and both gentlemen replied at a later stage.

Mr. J. Watt Sandeman, engineer, Newcastle-on-Tyne (who was introduced by the Chairman as one-time engineer to the Weaver Trust, and as one of the principal engineers connected with the hydraulic lift when it was first built), gave

"THE DESIGNERS"

of the reconstructed Anderton lift." He re-

marked that the ease and efficiency with which the lift had performed its function spoke very highly for the mechanical genius of Mr. Saner. It was worked more economically and with greater safety, and gave a great deal more facility for the interchange of the traffic by each lift being made independent. The whole work was highly satisfactory and reflected the greatest credit upon the engineer. (Applause.) As they were aware, the old hydraulic hoist, which occupied the site of the one they had seen, was initiated by Sir Leader Williams, and it devolved upon the late Mr. Duer and himself to carry it into execution. After fulfilling its purpose for 33 years, it had now been replaced by the modern appliance which performed its work so admirably. Thirty-three years for work of that kind was not a short life. With the rapid progress engineering science had made in recent years, mechanical appliances were very rapidly scrapped, and that the old lift had worked so long had been due to the care Mr. Saner and Mr. Wells took of it. Even in twenty years' time works which were thought to be very wonderful had long become antiquated. The use of electricity as an economical means of conveying power was gradually dominating all other systems, and its advocacy in this case was the most effectual means that could have been adopted of working the lift in an economical manner. There was a great personal satisfaction to an engineer in the successful accomplishment of any piece of work, but, irrespective of the approval of others, he had no doubt that Mr. Saner experienced that satisfaction which was somewhat akin to that of a man winning a race or achieving a century at cricket. But the success of an engineer did not only depend upon the mechanical genius or theoretical knowledge; it depended upon a great many qualities, and, looking back over a long professional career, it appeared to him that the organising and administrative abilities were foremost in making success alike in any walk of life. And judging from his success in that and other works, he thought he might venture to predict that if he was granted health, Mr. Saner would yet greatly distinguish himself as an engineer. (Hear, hear.)

Mr. J. A. Saner, in reply to the toast, thanked them very heartily, and also thanked Mr. Sandeman and other gentlemen for the very laudatory remarks which they had made about the piece of work just completed at Anderton. As Mr. Sandeman had said, it was really the greatest pleasure to an engineer to carry out a piece of work to a satisfactory conclusion. It was that feeling that he had that day in having the pleasure and honour in showing the work, not only to engineers, but also to those who represented the commercial side and interests of the river. The advantages that the new lift had over the old one Mr. Sandeman had put very tersely. It was first of all that they could carry a great deal more traffic through the two caissons when disconnected, as they now were, than formerly, and also that it was possible to reduce the actual cost of upkeep and of working. One of the greatest problems of the day—and it was an opinion he had held ever since he had had anything to do with waterways—was to devise some satisfactory and economical way of saving water and carrying canals through the country of a very

MUCH LARGER SIZE

than the present ones. (Hear, hear.) If they could only carry canals similar to those in Germany or in France, where the nation did the work and the inhabitants took the profits, they could have a canal of the same calibre as the Weaver (perhaps not so deep, but certainly able to carry the same tonnage as the Weaver barges), not only from Liverpool via the Potteries to Birmingham and London, but also up the Trent from Hull to the Severn. Thus there would not be anywhere in the country outside a reasonable distance from an economical waterway. He need not tell those who lived

in the Potteries that the waterways were by far the most economical way of carrying large quantities of goods, and it was easily proved by the fact that the L. and N.-W. Railway, although they came from Liverpool to Winsford—the centre of the salt industry—did not carry one pound of salt in twelve months. He had given evidence on this matter to the Royal Commission now sitting in London, and had given them all the information he possibly could in the hope that something might be done in the near future to improve the water communications, and thereby improve also the traffic and the commercial prosperity of the country. (Applause.) If he had done anything by thinking about this new arrangement of the lift, which would not only solve that problem, but solve the problem of getting over the considerable heights which they would have to combat in such a scheme as he had proposed, he should only be too thoroughly well repaid by thinking that he had done something at any rate for the advancement and the good of the country. (Applause.)

Mr. T. W. Forster (Weaver trustee representing the Inland Carrying Trade, Liverpool), proposed "The Chambers of Commerce and Corporations interested in traffic by inland waterways." Inland traffic was the whole existence of the Weaver, and, although the engineering department of the trust was at one end of the table and the carriage department at the other, he could assure them that they were closely allied in general routine business. They had the finest inland waterway in the country; they had the facilities, and they had only to look to the Chambers of Commerce, which at present acted as the Ministry of Commerce, and were, therefore,

SUBSIDIARY PARLIAMENTS,

to assist them in taking advantage of the facilities which were offered. He had been assured that the Commission would bring before the public a report which would be to the advantage of the commerce and the waterways of the country. They had with them the representatives of North Staffordshire and Birmingham commerce, and the river Weaver was the connecting link with the waterway which it was hoped would have Birmingham as its ultimate terminus. Such a scheme offered no exceptional engineering difficulties, and it was for the Federated Chambers of Commerce to see that it was carried through. (Applause.)

With the toast were coupled the names of Mr. Geo. Shipway (representing the Birmingham Chamber of Commerce), Councillor G. F. Adcock (Mayor of Hanley), Alderman Malkin (Mayor of Burslem), Councillor W. B. Hackney (Mayor of Stoke-on-Trent), and Mr. Walton Stanley (estate agent, Hanley).

Mr. Shipway acknowledged the kindness which had prompted the invitation, and spoke of the educational value derived from an inspection of the great lift and the navigation. They hoped the engineering feat they had witnessed would be the beginning of many triumphs for Mr. Saner. He was told it was the first of the kind in the world. It would need repeating in many places in the country, and he hoped Mr. Saner would have the honour of carrying out the work. In the centre of England they were deeply interested in water navigation; they felt that it was a matter of life and death. Situated as they were in Birmingham, they had to receive from and send everything to the coast, and unless they could have cheap transit Birmingham could not hold its position. They felt this keenly, and although they recognised that they had not a river Weaver in every county of England, he felt that the same skill and industry and enterprise might give them in every county of England a navigation on similar lines, even if smaller. He wished that Chambers of Commerce were doing the work the Ministry of Commerce ought to do. They were certainly increasing, and at Birmingham they had had a large accession of

members, to whom they looked for great things in the development of navigation and in other directions. (Applause.)

The Mayor of Burslem said he felt jealous that the Weaver had not been extended into the Potteries, but he trusted that in the near future they would be able to induce the trustees of the Weaver to join hands and link up the waterways of the Potteries.

The Mayor of Stoke-on-Trent felt that the Chambers of Commerce of the different towns would rally round the corporations in any commercial developments such as those indicated.

Mr. Stanley, in an eloquent speech, said it must be the object of those engaged in trade in the towns in the centre of England to secure a network of canals which would make for ease, efficiency, and economy in distribution. He did not think the canals suggested by Mr. Saner presented any great difficulties, and he recognised that the difficulties were commercial rather than engineering. One could assume how far it was possible for the nation to undertake a very large commercial project for the benefit of the whole of the community. It opened up a large number of social and political questions, including the large

QUESTION OF NATIONAL TRADING,

upon which some of them had some misgiving. They recognised that the wealth disseminated by the development of waterways would reach the whole of the population, and, therefore, if the people were called upon to pay for the project, they could not complain if they shared in the wealth which accrued. Therefore, it might be an intensely practical question as to how far the nation was justified, even at the risk of some political heresy, in endeavouring to provide for the whole nation some commercial advantages such as those suggested before the Royal Commission. They had only to look at the development of the Weaver since 1721 (with its 4ft. 6in. navigable depth) down to the present time, when vessels of 300 tons burden could navigate it, to see how far the canals of the country were capable of development. The canals of the Potteries might be enlarged for vessels of 70 tons. That would be an advance, but need not be looked to as the ultimate goal, and they recognised that the connection of the Weaver with the Potteries was something to be aimed at. (Applause.)

Mr. E. S. Inman (manager of the Weaver Trust), replying to the toast proposed by Mr. Jebb, said they hoped that the outcome of the Royal Commission would be to make the Weaver part of a general system which would ultimately tend to the happiness of himself as the general manager of the Weaver Navigation, and to the prosperity of the undertaking. It was quite possible for traffic to be carried by water equally as well or better than by rail, if only the waterways were better understood by the manufacturing and commercial community. The engineers would carry out the details, so that the waterways might be brought up to the necessary standard. (Applause.)

Sir Joseph Verdin made a valuable contribu-

tion on the subject of canalization. It occurred to him that as soon as the Potteries Federation was completed it would not be a bad idea to see how far they would advance money. Prior to the lift being inaugurated, he was strongly of opinion that there would be a great difficulty in getting an Act of Parliament to construct a canal of the same capacity as the Weaver, on account of the immense reservoirs which would have to be erected at the highest points, but that difficulty would now be overcome by

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as they had seen, because no extra water would be required beyond that necessary to meet the evaporation which took place on the canals. (Applause.) The serious question, then, was finance, and it had been shown how necessary it was that a better water communication should be made to enable them to compete in the distant markets. It was not far from Staffs. to Manchester, because, when they got to Anderton, they had a good canal all the way to Manchester and Liverpool for the great import and export trade of the world. The change that had taken place in the mode of transit from other countries had dealt a very severe blow at all the inland towns. The time was when the transport from Germany to London was 20s. to 25s.; to-day they could carry from Hamburg to London at 4s. and 4s. 3d. This was in consequence of steam and steamers designed on the most approved principles suitable for the trades they were engaged in. Therefore, unless they got a water communication they must go back. They could not stop at 70 tons, for the same distance had to be travelled and the same men employed as with vessels of 250 tons. The boats on the Weaver had appliances for transferring 300 tons a day to vessels at Liverpool 35 feet high free to the shipper. Before that class of steamer was introduced the cost to the manufacturer was fivepence per ton, so that if the Potteries had a canal capable of accommodating vessels of 250 tons, the expense of transport would be reduced two-thirds, which would leave an ample profit on the money invested in the vessel. It would not be a bad security if all the towns the canal would touch would advance money upon debentures, and other financial men would then come forward and take up shares, and so the work would be accomplished. There must be an effort of that sort, and he hoped that when they met again they would have gone a long way towards its realisation. (Applause.)

"The Press" was honoured on the proposal of Dr. Hewitt, and Colonel Dixon gave the health of the Chairman, whom he described as the moving spirit in the Weaver Trust. Although he lived in Herefordshire, Sir Joseph was always in Cheshire when wanted, and attended to the business of the Trust with assiduity. (Applause.)—Sir Joseph Verdin briefly replied, and this closed the toast list.

The remainder of the journey to and from Weston Point was something to be remembered.