

## Demolition of the medieval bridge at Rochester by the Royal Engineers, 1856--60

Times, Th 27 Nov 1856, p 7

An application has been made by Colonel H. Sandham, the director of the Royal Engineers' establishment at Brompton, to the authorities, to allow the troops under his command to be employed in the destruction and removal of old Rochester-bridge. The application was made in consequence of the very favourable opportunity which presents itself for exercising the officers and men in the demolition of ponderous works, and of the success which attended the destruction of the immense docks at Sebastopol by the troops belonging to the Royal Engineers. The authorities have accorded permission for the men of the Sappers and Miners to be employed in the undertaking, and a party of the Royal Engineers, under the command of Captain A. Schaw, R.E., have been engaged for a few days past at old Rochester-bridge making the necessary preparations for its removal. As soon as the troops have removed the upper portions of the bridge the piers and foundations will be destroyed by means of submarine explosions, in which undertaking the most skilful of the divers belonging to the corps will be employed.

Times, Wed 17 Dec 1856, p 7

The troops belonging to the Royal Engineers who are engaged, under the command of Captain H. Schaw, in making the necessary excavations for blowing up the piers and foundation of old Rochester-bridge have succeeded in sinking three shafts, which are carried down to some distance below the old foundation of the structure to be destroyed. Two of these shafts have been excavated to the depth of nearly 30 feet, but, owing to the interruptions experienced by the engineers from the breaking in of the water they could not be carried any lower. The other shaft has not been carried to so great a depth. The engineers are now engaged in driving a gallery at the base of the excavations, and in this gallery will be deposited the gunpowder used for destroying the works. Some idea of the character of the foundations it is intended to demolish may be formed from the fact that for one of the charges 5 cwt. of gunpowder will be required. The destruction of the first portion of the works will take place in the course of next week. The shafts have a diameter of 4½ feet.

Times, Tu 13 Jan 1857, p 10

The troops belonging to the corps of Royal Engineers who have been for some time past engaged, under the direction of Captain H. Schaw, R.E., in making the necessary preparations for the destruction of old Rochester-bridge, have

completed the excavation of a shaft on one of the piers of the bridge from which the arches have been removed by manual labour. At the base of the shaft two galleries have been driven, in which to deposit the gunpowder used in destroying that part of the works. The progress made by the troops has been such that it is intended to blow up that portion of the bridge this afternoon, when six charges of gunpowder will be deposited in the galleries and dired simultaneously by means of the voltaic battery. Each of the charges will be of about 50lb. weight. The explosion will take place at the time of high water, and will be under the general superintendence of Colonel H. Sandham, director of the Royal Engineers' establishment. General Sir John Burgoyne, G.C.B., Inspector-General of Fortifications, will be present to witness the undertaking. The destruction of a much larger portion of the bridge will take place by the Royal Engineers on Thursday next.

Times, Wed 14 Jan 1857, p 5

#### DESTRUCTION OF OLD ROCHESTER-BRIDGE.

ROCHESTER, Jan. 13.

The destruction of the first portion of old Rochester-bridge by the Royal Engineers was successfully accomplished this afternoon, under the general direction of Colonel H. Sandham, Director of the Royal Engineers' establishment at Brompton Barracks, Chatham, in the presence of Lieutenant-General Sir Charles W. Pasley, K.C.B., Major-General Sir Harry D. Jones, K.C.B., and a large number of Engineer officers belonging to that garrison, as well as several scientific gentlemen, who were anxious to witness the destruction by gunpowder of such immense works.

As soon as the demolition of old Rochester-bridge -- which has stood upwards of four centuries -- was decided upon Colonel Sandham made application to the proper authorities that the Royal Sappers and Miners and the East India Company's Engineers might be employed in its destruction, as it was considered that the rare occurrence of removing such a huge mass of masonry was one admirably adapted for practising the officers and men of the Royal Engineers in destroying great works, especially as the troops belonging to that branch of the service had given such successful evidence of their skill in the demolition of the immense docks at Sebastopol. The authorities immediately granted the application, and on the 24th of November last a body of Sappers and Miners, under the command of Captain H. Schaw, Royal Engineers, who has ever since very ably superintended the undertaking, commenced making the necessary preparations for destroying the bridge. For this purpose the engineers commenced sinking three shafts on different piers, which were excavated to the respective depths of 24 feet, 21 feet, and 15 feet, it being found im-

possible to sink them any deeper owing to the constant breaking in of the water. Each shaft had a mean diameter of 4 feet. As soon as the shafts had been completed to the required depth the working parties commenced driving a series of galleries, leading in horizontal directions from each shaft, in which to deposit the gunpowder used in blowing up the structure. The portion of the old bridge destroyed to-day was one of the large piers, near the Strood side, from which the arches and superstructure had been previously removed by manual labour. This pier was 36 feet in length, 21 feet wide, and 13 feet in depth, and was calculated to contain considerably more than 12,000 cubic feet of masonry, weighing 800 tons. From the shaft which had been excavated in this pier sprang six galleries -- viz., two of 10 feet in length, from the extremity of each of which branched at right angles another gallery of 3 feet in length; there were also two other galleries diverging from the central shaft, each 4 feet 9 inches in length, the galleries being each 4 feet deep by 3 feet in breadth, to enable the Sappers and Miners to traverse them. The weight of gunpowder required to be used in destroying this pier was 300lb., consisting of four charges, each of 60lb., and two lesser charges, each of 30lb., one charge being placed in each gallery. The powder was contained in tin cases enclosed in wooden boxes. The Royal Engineers were engaged at the old bridge during the whole of last night in preparing the galleries, after which the powder was deposited in the places selected. The operation of "tamping" then commenced, which consisted of surrounding the charges with materials to render the explosion more effective, and stopping up the head of each of the galleries with wet clay. The wires for firing the charges were laid in wooden troughs, to prevent accidents, and, a communication having been effected with each gallery, the charges were exploded simultaneously by means of the voltaic battery, which was under the direction of Captain C. E. Cumberland, Royal Engineers. The wire used for conveying the galvanic spark was the same as used by the Sappers and Miners for blowing up the Royal George at Spithead.

The effects of the explosion were most satisfactory, and the destruction of that part of the old bridge most complete, the large blocks of stone of which it was composed being rent asunder and hurled into the river, the only sight visible to the spectators being a violent upheaving of the water and the disappearance of the large pier. Notwithstanding the immense number of spectators present, the operations passed off without the slightest accident.

There will be another explosion of a still larger portion of the bridge by the Royal Engineers on Thursday afternoon, on which occasion there will be four charges fired, two of 250lb. each, and two of 150lb. each. His Royal Highness the Duke of Cambridge is expected to be present on that occasion.

Colonel H. Sandham, commanding the Royal Engineers, has published a "memorandum" to the troops, in which he offers his best thanks to Mr. Wright, the engineer of the

bridge works, for his ready concurrence in the whole of the proceedings, and also for the valuable assistance he has rendered the troops during the progress of the operations.

The whole of the troops belonging to the Royal Engineers and East India Company's service, as well as those of the Provisional Battalion at Chatham, were present to witness the operations.

Times, Th 15 Jan 1857, p 6

Destruction of Rochester-bridge. -- The following memorandum has been issued by Colonel H. Sandham, in command of the Royal Engineers' establishment, Chatham, respecting the arrangements which are to be observed by the troops on the occasion of the destruction of another large portion of old Rochester-bridge, which will take place this afternoon by the Royal Engineers: -- "On Thursday, January 15, after the blasts in the keystones of the arch shall have been fired, the two charges in the pier, each of 250lb., will be exploded, and then, after a short interval of time, the two in the abutments, each of 150lb. Captain H. Schaw, Royal Engineers, who has conducted the whole of the mining operations, and Captain C. E. Cumberland, who has made the arrangements for firing by the voltaic battery, will fire each set on mines at the sound of the bugle 'to fire,' after the sound of 'the preparative' has been given as a warning. The wires will be led from the charges to the voltaic battery, which will be placed in the office of Mr. Wright, the engineer of the bridge." The troops of the Royal Engineers who are employed in the undertaking were engaged until a late hour last night in making the necessary arrangements, and depositing the great quantity of gunpowder required for the explosion, in the galleries which have been driven at the base of the shaft. The whole of the troops belonging to the Royal Engineers, and the regiments of infantry at Chatham, will be drawn up to witness the operations.

Times, Fri 16 Jan 1857, p 10

#### DESTRUCTION OF OLD ROCHESTER-BRIDGE BY THE ROYAL ENGINEERS.

ROCHESTER, Jan. 15.

The experiments which are being performed in this city by the corps of Royal Sappers and Miners for the destruction of old Rochester-bridge were continued this afternoon, on which occasion a still larger portion of the ancient structure than that destroyed on Tuesday last was blown to pieces by successive blasts of gunpowder, in the presence of General Sir Charles W. Pasley, K.C.B., General Sir Harry D. Jones, K.C.B., General T. Blanshard, C.B., General P. Yule, Royal Engineers, and a large number of officers.

Since Tuesday a careful inspection of the large pier

destroyed on that day by the troops of the Royal Engineers has been made by Colonel H. Sandham, director of the Royal Engineers' establishment at Chatham, and a number of other Engineer officers, who have ascertained the results of the experiment to be very satisfactory, and the object for which they were undertaken fully realized, the large mass of masonry composing the pier, which was 45 feet long, 21 feet in depth, and 13 feet in width, having been shivered in pieces, and the huge blocks of stone loosened from their position, and rendered capable of being easily removed. This pier was built on piles, which were driven into the bed of the river, and so far as the state of the tide has permitted an examination to be made it is evident that the force of the gunpowder has had as great an effect in loosening the foundations as it has had upon the superstructure. The quantity of gunpowder used on Tuesday afternoon was 300lb. weight, divided into six charges, and some surprise was expressed by the scientific persons present that such a comparatively small quantity only should have been used in the destruction of such a large portion of the structure; but the object of the engineers was not so much the blowing up and scattering the materials of which the pier was composed as it was to shake the fabric to its foundation, and loosen the pier so that the materials might be readily detached without filling up the bed of the river -- a result which was most successfully accomplished.

The portion of the bridge destroyed by the troops this afternoon was very large, and consisted of the pier and abutment on which the large arch on the Strood side rested, and was calculated to contain several thousand tons of masonry. The weight of powder used in the explosions was nearly 1,000lb., and was divided into the same number of charges as in the previous experiments. Since November last the Sappers and Miners have been engaged in sinking two shafts in this portion of the bridge, which were excavated to the respective depths of 24 and 21 feet; one shaft having been sunk in the pier, and the other in the abutment, this portion of the undertaking having been conducted from the commencement by Captain H. Schaw, Royal Engineers. At the base of each shaft sprang two galleries, each 9 feet in length, and in these were deposited the charges of gunpowder used in the destruction of the works. The powder was contained in tin waterproof cases, which were enclosed in wooden boxes, 500lb. weight being required for blowing up the pier and arch, and 300lb. weight in destroying the abutment. The keystones of the arch were removed by means of smaller blasts. The Royal Engineer troops were engaged last night and this morning, under the command of Captain Schaw, in making the requisite preparations for the explosions, and at an early hour this morning the four charges of gunpowder were deposited in the galleries, when the operation of "tamping" was proceeded with, and the whole of the approaches to the galleries carefully stopped up. The voltaic battery was worked as before by Captain E. C. Cumberland, Royal Engineers.

In order to prevent accidents Colonel Sandham issued the following notice: --

"On Thursday, the 15th inst., after the blasts in the key-stones of the arch shall have been fired, the two charges in the pier, each of 250lb., will be exploded, and then, after a short interval of time, the two in the abutments, each of 150lb. Captain H. Schaw, Royal Engineers, who has conducted the whole of the mining operations, and Captain C. E. Cumberland, who has made the arrangements for firing by the voltaic battery, will fire each set of mines at the sound of the bugle 'to fire,' after the sound of 'the preparative' has been given as a warning. The wires will be led from the charges to the voltaic battery, which will be placed in the office of Mr. Wright, the engineer of the bridge."

As soon as the arrangements had been completed Colonel Sandham ordered the bugle to be sounded, as a warning to those present to remove from the places of danger, and immediately afterwards the bugler sounded "to fire." The charges in the arch were first exploded, followed by those in the pier. The effect was very striking, the ground for some distance reverberating as if from the effects of an earthquake, while the pier crumbled in pieces and disappeared. The large arch of the bridge was blown into the river, and the abutment on the Strood side entirely removed, the sight of the massive stonework of the arch being blown high into the air being very grand. Nearly one-half of the bridge has now been destroyed, and the remaining portion will be demolished as speedily as possible.

The whole undertaking was considered perfectly satisfactory by Colonel Sandham and the general and other officers present, and reflected much credit on Captains Schaw and Cumberland, under whose arrangements the explosions took place.

Notwithstanding a very heavy rain an immense number of persons were present to witness the operations, and the troops of the Royal Engineers and the provisional battalion were drawn up on the bank of the river and on the new iron bridge.

The whole of the operations of this day and Tuesday passed off without the slightest accident.

Times, Fri 23 Jan 1857, p 9

On the application of Colonel H. Sandham, commanding the Royal Engineers' establishment at Chatham, the authorities have accorded permission for the troops belonging to the Royal Engineers to continue their operations in destroying old Rochester-bridge.

Times, Sat 18 Jul 1857, p 5

The Deputy Adjutant-General, Colonel J. W. Gordon, C.B., R.E., Aide-de-Camp to the Queen, accompanied by Colonel F. E. Chapman, C.B., arrived at the head-quarters

of the Royal Engineers' establishment, Chatham, on Thursday afternoon, for the purpose of inspecting the troops at Brompton Barracks. .... The whole of the officers of the staff then proceeded with the Deputy Adjutant-General to Old Rochester-bridge, where the Sappers and Miners were engaged in some siege operations for the destruction of that structure. Two heavy charges of gunpowder were exploded by means of the voltaic battery, which destroyed the crown of two of the arches of the bridge. The experiments were under the direction of Major F. C. Hassard, Royal Engineers.

Times, Mon 24 Aug 1857

The troops belonging to the Royal Engineers at Chatham were on Saturday engaged in a series of operations at Old Rochester-bridge, for the purpose of destroying that ancient structure. On Wednesday another large portion of the old bridge will be destroyed by the Sappers and Miners.

Times, Wed 23 Sep 1857, p 10

OLD ROCHESTER BRIDGE.

ROCHESTER, Tuesday.

A series of grand explosions took place this afternoon at the old Rochester-bridge, for the purpose of demolishing the remaining portions of that huge structure, the handsome bridge which now spans the Medway having been for some time open to the public. The idea of employing the troops of the Royal Engineers in the removal of the old bridge originated with Colonel H. Sandham, the director of the Royal Engineers' establishment at Chatham, who considered it would be unwise to allow such a rare opportunity to pass for the men of the Royal Sappers and Miners to take part in the destruction of the works, especially as the Royal Engineers had been so successful in the siege operations for destroying the great docks at Sebastopol. On the proposal being made to the authorities permission was at once accorded, and for nearly 12 months past the Royal Engineers have been engaged, with scarcely any intermission, in sapping and destroying various portions of the ancient structure, the works being carried on under the superintendence of Captain W. H. Noble, R.E., an officer of great intelligence and experience.

The old bridge, which has been built nearly five centuries, originally consisted of 10 large arches, resting on nine piers and two abutments; the Royal Engineers have already succeeded in destroying five arches, three piers, and the abutments; but, owing to the immense strength and solidity of the structure, the operations have necessarily been carried on but slowly. Six piers, five arches, and nine "starlings" remained to be destroyed, and nearly the whole of these were successfully blown to pieces this

afternoon in the presence of the Earl of Romney, the wardens and assistants of Rochester-bridge, Lieutenant-General Sir Charles W. Pasley, K.C.B., besides a large number of officers of the Royal Engineers and the Royal Artillery, the whole of the operations being under the superintendence of Colonel H. Sandham, assisted by Major F. C. Hassard, Royal Engineers.

The operations commenced this afternoon by the destruction of the lower portion of No. 4 arch from the Rochester side, which was thrown down by means of two charges of gunpowder lodged in one of the voussoirs of each haunch of the arch, and two charges lodged in the voussoirs next the keystone. A charge of 30lb. of gunpowder placed under the soffit of the keystone of the upper added portions of the arch was next exploded, the effect of which was to throw down the whole of that portion of the arch acted upon. The troops next proceeded to destroy the third arch in a similar manner. Nine charges of 4lb. each were placed in the voussoirs of the haunch, and also nine of 1lb. each in the voussoirs next the keystone of the old portion of the arch before the bridge was widened. These charges were fired simultaneously by means of the voltaic battery, the result being that the arches were destroyed, and the masonry of which they were composed entirely detached. The finest explosions of the day, however, were reserved for the latter part of the operations, when three of the massive piers were blown down by means of several charges of gunpowder, weighing in the aggregate about 1,000lb. In order to facilitate the operation, the Sappers and Miners had previously excavated a shaft in each of the piers to be destroyed, which was sunk to a depth of about 30 feet. Each of the shafts was about four feet square, and at the base projected a number of galleries, in which were deposited the large quantity of gunpowder required for the explosions. In the third pier, which was the first blown up, 400lb. weight of gunpowder was laid in two charges, each containing 200lb. The galleries were then firmly closed by means of "tamping." The second pier had likewise 400lb. of gunpowder placed in the galleries, also in two charges, and the first pier 266lb. At the sound of the bugle the charges in the third pier were ignited by means of the voltaic battery, worked by Captain H. Y. D. Scott, Royal Engineers. The effects of the explosions were most complete, the large mass of earth and masonry, containing, it was computed, about 20,000 cubic feet, being lifted up from its foundation and scattered into fragments, retaining not a vestige of its original form. The second pier, after a short delay in fixing the wires, was destroyed in the same manner, the shock of the explosions being felt at considerable distance, the ground being sensibly shaken as if from the effects of a distant earthquake; the river, also, being considerably agitated. The first pier, which contained as large a mass of stones and earth as the other two, was the last destroyed, several of the huge stones of which it was composed being hurled to some distance.

The whole of the operations were highly successful, and, notwithstanding the immense number of spectators present,



not a single accident occurred.

During the operations a body of the Royal Engineers, not engaged in the explosions, were employed in forming a bridge of rafts with General Blanchard's pontoons across the Medway, some distance above the old bridge. The river at that spot is very wide, which prevented the bridge being extended from shore to shore. It was, however, carried out a considerable distance into the river, and when completed the whole of the troops, together with a large body of spectators, took up their position upon it for the purpose of witnessing the operations at the old bridge.

The Royal Sappers and Miners will continue their operations at the bridge until the whole of that structure is entirely removed.

Morning Chronicle, Wed 23 Sep 1857, p 5

#### GREAT EXPLOSION OF ROCHESTER OLD BRIDGE BY THE ROYAL ENGINEERS.

[FROM OUR OWN REPORTER.]  
ROCHESTER, Tuesday Evening.

For some days considerable excitement has prevailed in this neighbourhood since the announcement that the grand explosion of the Old Bridge, which has been put off several times, would take place this afternoon at high spring tide. The bridge thus doomed to destruction is of great antiquity, having been built about the year 1350, and of amazing solidity, justifying the remark of a perspiring Sapper the other day, that it seemed "built to last through all eternity." It is a few yards from the new bridge, which it is quite certain will not last as long as its predecessor. The corps of Royal Engineers have had entrusted to them the work, a very arduous work, of demolishing this venerable structure. They have found enormous difficulties in the way of sinking the shafts to deposit the gunpowder, the masonry being harder than the solid rock.

The Duke of Cambridge was expected to-day, to witness the explosion, but was unable to be present. The Mayor had a day or ago issued a notice, cautioning the public not to stand on the Rochester end of the new bridge -- a warning not ill-timed, for on the last occasion a fortnight or three weeks ago, a stone weighing 2 cwt., was thrown up into the air, and came down within a yard or two of a crowd of people, ultimately dropping in the yard of a low public-house, at the Rochester end of the new bridge, where it sank several inches in the ground. The only casualty which occurred to-day was a smash of several panes of glass in the windows of a gentleman's residence at the foot of the bridge. Several scientific gentlemen were present, on this occasion to witness the operations, including General Sir Charles Pasley, K.C.B., F.R.S. Amongst the general company were the Earl of Romney, and party; Mr. William Masters Smith (late M.P. for West Kent), and party, &c.

The explosions were by the voltaic battery, under the management of Captain Scott, R.E.; the end of the wire being placed in the bridge-chamber. The mining operations were directed by Captain Noble, R.E. The whole of the works at the bridge are controlled by Colonel Sandham, R.E. The weather being beautiful, the sight was a very brilliant one. Both banks of the Medway were lined with spectators, among whom the military uniforms presented a lively variety. The heights of the venerable old castle, which frowned in its lofty security over the destruction of its younger neighbour, were crowded with soldiers, and the more adventurous and juvenile portion of the public. Several hundred of the Royal Engineer corps were stationed on a cleverly constructed pontoon bridge, which spanned at least one-third of the river.

About a quarter to three the first sound of the bugles was heard, and the lower portion of the fourth arch from the Rochester end was thrown down by two charges of 4 lbs., each lodged in one of the voussoirs of each haunch, and two charges of 1 lb. each lodged in the voussoirs next the keystone. Two charges of 30 lbs. each were then exploded under the soffit of the keystone, after which the added portions of the third arch came to similar grief. The "smash in" of the third arch followed, caused by 9 charges of 4 lbs. each in the voussoirs of the haunch, and 9 charges of 1 lb. each in the voussoirs next the keystone of the old portion of the third arch, which were fired simultaneously. The grand explosions were then effected. Two charges of 200 lbs. each, placed in the third pier from the Rochester end, were exploded, and destroyed in the neatest and completest manner the third pier and the fourth arch, which were heaved up as if by invisible agency, for there was no noise of an explosion, and crumbled into pieces. Two other charges of 200 lbs. each destroyed immediately afterwards the second pier, and the first pier went the way of all the others next, but it only took 266 lbs. to do his business. This terminated the proceedings, which appeared to give as great satisfaction in a scientific point of view as it did to the uninitiated portion of the community, who were born, perhaps, like Lord Derby, in the "prescientific era."

Times, Th 22 Sep 1859, p 7

Since the 27th company of Royal Engineers returned to head-quarters, Chatham, from Woolwich, where the men were employed in completing the Armstrong gun factory, the whole of the officers and men have been put through a course of instruction in submarine operations and diving at Rochester-bridge, with the diving apparatus invented by Mr. Heinke, in order that they may be perfected in this portion of engineering instruction previously to embarking for the Mauritius to join the 22d company. The divers work at a depth of about 40 feet, and since they have been employed at Rochester-bridge have

succeeded in removing a considerable portion of the foundation of the old bridge. In consequence of the hazardous nature of the work in which they are engaged each man receives a daily sum, as working pay, in addition to his regimental pay. The diving operations are all being carried out under the direction of Major J. W. Lovell, C.B. Notwithstanding the number of men who are daily employed under water, not the slightest accident has happened to any of the divers, the apparatus invented by Mr. Heinke being so much under the control of the diver himself as almost entirely to prevent the possibility of an accident occurring.

Times, Fri 28 Sep 1860, p 10

A party of Royal Engineers have been engaged in engineering operations at Rochester, where they have been employed in blowing up the remaining portions of the foundation of old Rochester-bridge, and clearing away the piles and other obstructions from the bed of the river.