merchants out of the way, was to destroy the old, comfortable and — one suspects — rather inefficient local arrangements and substitute a national organisation.

The same thing was going on at the same time in other trades supplying consumer goods — the soap trade, for example, and some branches of the food trades, and it was bound to happen as the growing economy of the United Kingdom attracted the attention of businesses conducted on an international scale. Economic change is rarely painless and the oil companies were not unduly concerned to conduct their operations under anaesthesia. Their enemies, however, and they were many, would find it hard to deny that the marketing organisation set up by Standard Oil and the rest of the giants was likely to serve the ultimate consumer — the Devonshire housewife — better than the system destroyed to make way for it.

This article originally appeared, in a different form, under the title **Oil for the West of England**, in **The Business History Review** XXXV 1. (1961).

### Sources

Chiefly papers in the archives of Unilever Limited, to whom I am indebted for permission to use them. See also Ralph W. and Muriel E. Hidy, **Pioneering in Big Business: History of Standard Oil Company** (New Jersey), 1882-1911, Vol. 1 (New York, 1955).

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## DEVON RECORD OFFICE

### Exhibition of Silver Jubilee documents

An exhibition of the documents used in the Silver Jubilee booklet for Devon school children will be held in the West Country Studies Library of Exeter Central Library, Castle Street, Exeter from 25th September to 7th October (Mondays to Fridays 10 a.m. to 5 p.m.), in the Scott Lecture Theatre of Plymouth Central Library from 18th October to 21st October (Tuesday, Wednesday and Friday 10 a.m. to 5 p.m. and Thursday 10 a.m. to 12 noon), in the Pilton School and Community College, Barnstaple on 1st November from 10.30 a.m. to 4 p.m. and at Torbay at the School of Art, Fleet Street, Torquay on 8th November from 10.30 a.m. to 4 p.m.



## THE EARLY YEARS OF HYDROELECTRICITY FOR PUBLIC SUPPLY IN DEVON

**D.G. Tucker**

Hydroelectricity plays a very small part in Britain's electricity supply; in England its role is negligible. The reasons are obvious: no large rivers and no really large mountains. In the early days, before the electricity grid, what mountains we have were too remote from the centres of demand to be useful except in special cases, such as the electrical smelting of aluminium, where in 1896 works were set up at Foyers in Scotland near to a large source of water power. For public electricity supply, hydroelectricity has never had, in Britain, any very important place. Nevertheless, there have always been some hydroelectric stations and of the nine water-powered electricity stations set up for public supply in Britain before the end of 1894, no fewer than three were in Devon; moreover, all three were long-lasting, while some of the others were only transitory. The three were at Okehampton, Lynmouth and Chagford. There were abortive proposals for hydroelectricity in three other Devon towns: Exeter, Plymouth and Tiverton (out of at least 45 abortive proposals by 1894 in Britain generally). The story of these six early hydroelectric schemes is the subject of this article. It is of interest to note that Devon's early pre-eminence in hydroelectricity has been maintained in one sense; the county now has England's only three public hydroelectric generating statons, at Mary Tavy, Morwellham and Chagford; these are, however, very small stations compared with those in Wales and Scotland.

It is worth listing the nine British hydroelectric stations used for public supply up to 1894. They were, with dates of opening:

Godalming, Surrey, September 1881
Greenock, Renfrewshire, March 1885
Wickwar, Gloucestershire, 1888
Blockley, Gloucestershire, 1888
Okehampton, Devon, about January 1889
Keswick, Cumberland, January 1890
Lynmouth, Devon, March 1890
Chagford, Devon, September 1891
Worcester, October 1894

The first two were basically experimental and were very short-lived. The next three were casual, in the sense that they grew out of existing water-powered activities. Keswick was the first purpose-built permanent public hydroelectric station but even so it used an old mill site with its existing water supply only slightly extended. Lynmouth, which followed Keswick so closely, was purpose-built entirely and by 1895 had what was probably the world's first pumped-storage system and a most interesting arrangement of turbines. With the exemption of Chagford (also in Devon), Lynmouth had the longest life.

The demand for a public electricity supply was stimulated by the invention of the incandescent filament lamp by Swan, in Britain, in 1878, and by Edison,

in the United States, in 1879. The earlier arc-lights had been unsuitable for general use; with about 1200 candle-power, they were suitable only for lighting public places, halls, large stations, etc. The small filament lamps, of perhaps 8 to 16 candle-power, were attractive for domestic, business and industrial use and demand for them and for a public electricity supply from 'central stations' (as opposed to local private stations serving only one set of premises) grew rapidly from 1881 onwards. Inhibitory legislation in 1882 rather impeded development in Britain but after the amended Electricity Act of 1888, which gave companies security from compulsory purchase by municipal authorities for 42 years and established a fair basis for such purchase, expansion was as rapid as the demand. By 1894 there were in Britain at least 100 central stations, mostly driven by steam or gas engines, with an average capacity of about 350 kW for those stations outside London. Of the hydroelectric stations, only that at Worcester was above this average capacity; the rest were well below it. The early central stations were all operated by companies but in the 1890s many municipal authorities set up their own electricity undertakings in the belief — often justified — that they would show a profit and help the rates. In Devon, all three hydroelectric systems which materialised were company-operated. The system at Exeter, which was to have been water-powered, was also in company hands; but those at Plymouth and Tiverton were municipal.

There were, as has been mentioned, a large number of abortive hydroelectric schemes. It was natural for companies and local authorities to think first in terms of water power, for it was the general nineteenth century experience that water power, when available, was cheaper than steam power, especially in places, like Devon, not very close to a coalfield. The very limited operating data on the early hydroelectric stations suggests that they were indeed cheaper per unit generated than steam stations of the same size. Nowadays this is no longer true in Britain; high interest rates on the greater capital expenditure and the costs of transmission have made hydroelectricity generally more expensive than thermally-generated supplies.

## THE THREE SUCCESSFUL SYSTEMS

### Okehampton, 1889

Public electricity supply at Okehampton was an offshoot of a private installation. Mr. Henry Geen (who became the principal of the firm of Blatchford, Ash & Company) was a builder and timber merchant in quite a large way of business and had installed a turbine to drive the machinery of his sawmill, using water from the East Okement river. He also coupled to the turbine a 110 volt dc dynamo and used the electricity to light the sawmill and possibly also to drive some motors.

In December 1888 it was announced that Geen was about to undertake the public supply of electricity in Okehampton upon a very limited scale; 125 incandescent lamps was quoted as the limit of load for which power was available. Several houses were being wired and the supply lines were to be put underground. In March 1889 it was announced that the system had proved successful and that the gas company now wanted to supply electric light too! Although the



gas company took the matter a little further, nothing came of their proposal and in 1890 Geen's supply was recorded as having a capacity of 220 8-cp lamps — about 8 kW.

The demand for Geen's public supply grew and in 1896 he supplemented the water power with a 50 hp Worth-Mackenzie compound vertical condensing steam engine supplied by a Babcock and Wilcox water-turbine boiler which was fired mainly by wood refuse from the sawmill blended with steam coal. This was later replaced by a 30 hp Crossley suction gas engine and suction gas plant. After World War I two 60 hp Gardner petrol-paraffin 4-cylinder direct-coupled generating sets were bought from the War Office. Still at the sawmill, and providing about 110 kW, this plant was taken over by the West Devon Electricity Supply Company in 1930 and eventually dismantled when their new Mary Tavy hydroelectric station was opened in 1937. (This was, and remains, England's largest hydroelectric installation with a capacity of 2.6 MW). Whether the turbine at Okehampton continued to contribute to the generation of electricity right up to the end of the Okehampton plant is not quite clear.

In the early 1920s the Okehampton Town Council was negotiating with the proprietor of the generating station (then shown as G.K. Blatchford, presumably a partner of Geen's) for the purchase of the undertaking. Evidently nothing came of this for in 1925 the works were owned by W.H. Heath & Company of Plymouth, the manager being W. Leigh, who had been manager under Blatchford.

The weir on the East Okement river still exists, at grid reference SX 590951 (see Plate A) and the buildings remained until recently at SX 590952.

### Lynmouth, 1890

The initiative for the provision of electric lighting in the twin towns of Lynton and Lynmouth was taken by Mr. Charles Geen, a brother of the Henry Geen who had set up the system at Okehampton. He formed the Devon Electric Light Company in early 1889 and proposed a system which included the lighting of the public places, streets, etc. in the twin towns. In August 1889 the Lynton Local Board (which also administered Lynmouth) accepted his terms and the work went ahead. The hydroelectric generating station was at Lynmouth and is shown in Fig. 1. It had three floors, the lowest being occupied by the turbines and generators, the next by offices and workshops and the top floor was used for stores.

The generating plant as initially installed was simple enough. The water power was obtained from the East Lyn river by way of a weir, then an open leat, 6 ft. wide by 3 ft. 6 ins. deep, for the first 400 yards, and finally a 30 inch iron pipe for 520 yards to the station (see Fig. 2). The head at the turbine was about 90 ft. A horizontal-shaft reaction turbine of the 'Little Giant' type was used, made by Hett of Brigg in Lincolnshire; it could develop a power of around 150 hp. It had a draught pipe into the tail race. Regulation was by hand-wheel control of a slide valve controlling the flow of water. Two Mordey alternators were driven by the turbine on a single shaft, as shown in Fig. 3; each could develop about 37.5 kW at 2000 volts. Distribution was at this voltage using

Callender's bitumen-covered, lead-sheathed cables laid underground, some directly but mostly in bitumen-sealed wood casing. Transformers were used to step the voltage down as required; the frequency was 100 Hz (or cycles per second).

The cables gave a lot of trouble at first and during the first winter after the opening in March 1890 the supply failed entirely for about two months because of cable faults. The difficulty was apparently with the joints, which could not be kept waterproof in spite of being 'boiled in pitch **in situ**, and then protected by soldering a lead sleeve over all'. But by January 1892 it was becoming clear that the electric light was much appreciated; in June the surveyor to the Local Board gave a very satisfactory report upon it; and business expanded so fast that the company began to have difficulty in meeting the demand, especially when the water flow in the river was low. Pressure was put on the company to install more machinery.

Geen sold his company to Mr. H.H. Benn at the beginning of 1892. Benn apparently had not the money to increase the plant and in October 1893 he suggested to the Local Board that it should take over the undertaking at a rental of £193 per annum. The Board declined and by December Benn had to refuse to take on any more business. By the end of April 1894 he had sold out to a new company, the Lynton & Lynmouth Electric Lighting Company, who were stated to be prepared to generate more power and thus give a more efficient service. The Local Board promised that if they were satisfied that the new company could meet the demand, they would extend the contract for public lighting to the new company for 14 years.

The new company's plans included not only new turbines and alternators, but also a pumped storage system. Evidently they were able to provide a new injection of capital but where it came from is not clear, as the only directors in 1896 were Benn and Geen, the latter being managing director up to at least 1923. The company was a new legal entity but comprised the same people! At any rate, the new plant was actually installed.

The Lynmouth pumped storage system may well have been the first in the world used in connection with electricity generation. During periods of low demand (i.e. normally during the daytime), a turbine driven by the river was used to pump water up a pipeline to a reservoir on Summerhouse Hill, some 760 ft. above the generating station, and of a capacity of 190,000 gallons, being 50 ft. in diameter with a depth of over 16 ft. at the outlet side. Then, when the heavy demand developed (in the evening), this water was fed back to drive two high-pressure turbines or Pelton wheels which were coupled to two alternators (the original ones) on one shaft, and a new 75 kW ECC alternator on another. The original low-head turbine and a new low-head Pelton wheel were coupled in parallel with the corresponding high-pressure turbines, so that it was possible to drive the generators from the river flow, from the reservoir or from both together. This made for very flexible operation and enabled the company to put off having auxiliary engines for a long time.

By 1899 the public lighting comprised 59 incandescent lamps of 32 cp and



one Brush arc lamp of about 2000 cp on the Rhenish Tower at the end of the pier at Lynmouth. Iron poles were used in the main roads and wooden ones elsewhere. The Local Board paid the company £3 per incandescent lamp per year.

For private consumers, a contract basis was also used, this being at the rate of £1 per year for each 16-cp lamp installed. Some consumers, however, were provided with meters and they were charged 8d. per unit in summer and 5d. in winter, for the first hour; all subsequent hours in the same day were charged at 4½d. per unit summer and winter.

The supply was commenced each day at 30 minutes before sunset and closed down at midnight. In December and January supply was given additionally between 6.30 a.m. and 9.00 a.m.

Up to July 1889, when the original system was planned, it was confidently believed, on the basis of local experience, that the minimum summer water flow would be sufficient to provide at least 200 hp. However, it seemed that the flow diminished every summer until by August 1898 only 20 hp was available. The pumped-storage system considerably alleviated the difficulty but at times in 1898 there was insufficient flow to enable the reservoir to be pumped full and restrictions had to be put on the supply to consumers. It was at this point that a decision to install a steam engine was announced.

There is contradiction in the various records and it has not been possible to determine if a steam engine was actually installed. Whether it was or not, two Parsons oil engines totalling 100 hp had been installed by 1923.

In later years, demand continued to increase. It was nearly quadrupled between 1903 and 1920 and by the end of its life the station supplied a peak load of about 440 kW. The Parsons engines were supplemented by a 100-hp 3-cylinder Ruston-Hornsby engine (installed new in about 1928), a 160-hp 4-cylinder Sulzer engine (second-hand, about 1933), a 90-hp McLaren-Benz 4-cylinder engine (second-hand, about 1938) and a 165-hp 5-cylinder Ruston-Hornsby engine (second-hand, about 1947); and a number of new and second-hand alternators were also added. All this plant was still functional in 1952.

It was in August 1952 that the terrible floods struck Lynmouth and along with much other serious destruction of life and property, put an end to the hydroelectric station. At this time the South Western Electricity Board, which had by then become responsible for the local system, was in process of changing over the district to a supply on the standard frequency of 50 Hz and a 33 kV transmission line, operating for the time being at 11 kV, had been put in to connect the area to the grid. Parts of Lynton were already using the new supply. So presumably the days of the hydroelectric system were numbered anyway and the floods merely accelerated its demise.

There are very few remains of the system now to be seen.

**Chagford, 1891**

The hydroelectric supply at Chagford was provided from a woollen mill, the water wheel of which was used to drive a 20-kW alternator; it was thus more in the class of the Okehampton system than of the specially-built Lynmouth installation.

In November 1890, the registration of the Chagford and Devon Electric Light Company was announced; it had a registered office in London and a capital of £2,000. Public lighting commenced on 1st September, 1891 and presumably, there were private consumers also. By 1900 there were the equivalent of 600 8-cp lamps connected, with 16 lamps for street lighting.

The water power came from the river Teign by a leat, as shown in Fig. 4. The generating plant was at grid reference SX 694878. The water wheel was of undershot type, 14 ft. diameter and 14 ft. wide, and, by means of belts, drove two Siemens alternators with Crompton exciters. The voltage generated was 2000 volts at a frequency of 99 Hz. Transformers were used to change this down to 100 volts at the consumers' premises. By 1900 the distribution was by lead-covered, paper-insulated cable.

The company expanded financially, having, by 1922, expended over £7,500 on plant, although there were still only 22 public lamps and 80 consumers. The expenditure on plant included the purchase of a gas engine made by the National Gas Engine Company, a suction gas plant and a storage battery. By now the system had been changed to a 200-volt dc basis and the water wheel had been replaced by a 30-hp turbine, which certainly gave over 50 years service and may possibly be still in use. The old mill buildings no longer exist and the generating station is housed in a separate small building (see Plates B and C). The company became part of the West Devon Electricity Supply Company in 1930 and it is now (i.e. in June 1977) still in operation, with an installed capacity of 26 kW, 3-phase ac, under the CEGB and connected to the national electricity grid system.

## THE THREE ABORTIVE SYSTEMS

### Exeter

As early as January 1882 a proposal was received by the City Council from a company desiring to provide electricity, generated by water power, for lighting in Exeter. Nothing came of this but a similar proposal was made in 1887 and it was even reported in June that year that the company was about to make a start. It does not seem to have got started but certainly some temporary electric lighting provided in the streets made an impression, for in February 1888 a public meeting of 2,000 people urged that permanent electric lighting of the streets be provided and agreed that water power should be used. The Council advertised for tenders and the Exeter Electric Light Company made detailed proposals for a system based on turbines to be fitted at Trew's Weir; there were to be four, each of 24 hp. Unfortunately the Council (with other objectors) could not agree to the weir being used in this way and the company had to abandon its plan to use water power; it acquired another site at Rockfield Factory and by mid-1889 was supplying electricity to consumers.

It is perhaps ironical that Trew's Weir has for many decades been providing water power for a turbine at the paper factory.

### Plymouth

In September 1891 the Borough Council set up a sub-committee to confer with the Devon and Cornwall Electricity Supply Company regarding the provision of electric light in Plymouth. It was suggested by a correspondent in the local paper that water power should be used, based on the head available at Drake's Place, at the King's Mill site and at the old Providence Mill site, all three belonging to the town. Within two months the Council had instructed the Works Committee to consider whether the Council ought to obtain powers itself for providing electricity, negotiations with the company having failed, and to confer with the Water Committee as to whether water power could be made available.

It was late in 1893 before Council resolved to apply for a Provisional Order under the 1888 Electricity Act. (The significance of a Provisional Order was that it gave statutory powers to open up roads, etc., for the laying of cables and other plant; although many of the smaller undertakings, such as those at Okehampton and Lynmouth, did not bother with such things because of the legal costs, it was accepted as obligatory on Councils to do so.) 'They were hopeful that at some time they would be able to provide their own power for electric lighting in connection with the water supply....' The Provisional Order was obtained in July 1894 and the Council consulted Professor J.A. Fleming about the system to be adopted. He reported in October 1895, proposing a site at Cattewater with steam power; the idea of water power was not pursued further but the reasons for dropping it were not explicitly stated.

Plymouth commenced its public electricity supply in September 1899.

### Tiverton

It was again the Devon and Cornwall Electricity Supply Company that stimulated consideration of electric lighting by the Council. The company had given notice in October 1889 of its intention to apply for a Provisional Order but the Council had considered it undesirable that a company should have the monopoly of electricity supply for 42 years and so decided to oppose it and to apply for a Provisional Order itself. This was granted in August 1890. Companies were then invited to make offers to take over the order for a more limited term but no offers were received. The Borough Surveyor, Mr. J. Siddalls, was requested to make his own proposals for electric lighting, in consultation with an expert, Mr. F. Christy of Chelmsford, and other advisers. His report of February 1893 was a very thorough and careful statement of the position. He recommended the use of water power from the river Exe near the sewage farm, below the confluence with the river Lowman, using initially two 100-hp turbines driving two 60-kW alternators for a high-voltage ac distribution. Later expansion of demand could be met either by the use of gas engines or by a pumped-storage system with a reservoir 400 ft. above the station. Siddalls described the latter system as a hydraulic accumulator and it is noteworthy that the proposal ante-dated the Lynmouth pumped-storage system, although it is, of course, possible that the latter had been talked about before 1893, even though my first record of it is in 1894. The initial water-powered system, in spite of interest and depreciation on about 33 per cent higher capital cost, was estimated to cost only three-quarters as much to operate as a corresponding steam-powered system.

The Council seemed to consider the proposal too ambitious and let the scheme go into abeyance. In 1894 they were considering whether they could

acquire the gasworks and run a joint gas and electricity undertaking. By 1899 they were considering an electricity scheme of about half the size of the 1893 proposal, with low-voltage dc distribution. By 1900 they were back to the water-powered scheme and were seeking sanction for a weir. In November 1901, a new site at Washfield Mills, about two miles from the town, was being considered. Expert after expert was consulted. By November 1902 the Council went back to the idea of a site by the gasworks, using gas engines, and also to the idea of getting a company to take over their latest Provisional Order. By 1903 or 1904 it was clear that the idea of water power had been finally abandoned, seemingly due to difficulties raised by the Fisheries Department of the Board of Trade. But the Board of Trade did not approve the company proposal either, as it did not think it gave enough protection to the ratepayers.

In spite of all this consideration and negotiation, Tiverton failed to get a public electricity supply until the mid-1920s!

## SOURCES OF INFORMATION

About 100 separate reports, articles, communications, etc., have been used in the preparation of this article and it is not worthwhile to cite them all individually. The main sources are the contemporary technical journals, **The Electrician**, **The Electrical Engineer** and **Engineering**, and E. Garcke's **Manual of Electrical Undertakings**, published annually from 1896. Local newspapers have also been used. Particularly valuable items have been the following :-


J. Hellier, 'The pioneers who gave Devon the lead in hydroelectric power', **Western Morning News**, 18th February 1967, p.10.

J.H. Fooks Bale, 'The Electric Lighting of Lynton and Lynmouth', **Electrical Engineer**, 23 (1899) pp.430-3.

'A Pioneer Pumped-Storage Scheme', **Water Power**, 7 (1955) p.76.

Helen Harris, **Industrial Archaeology of Dartmoor** (Newton Abbot, 1968) pp.119-20 (concerning Chagford).

The national background of early hydroelectricity is set out in: D.G. Tucker, 'Hydroelectricity for public supply in Britain 1881-1894', **Industrial Archaeology Review**, 1 (1977) pp.126-63.



I have also had the benefit of information supplied privately in correspondence by the following :- Dr. R.L. Taverner (re Okehampton), and Mr. T. Brookhouse and Dr. R. Ferrer (re Lynmouth). I am very grateful to all three for the very considerable help they have given me.


Finally, I must add that my search for information has not been exhaustive and that there is still plenty of scope for local historians to fill in the details (and gaps) in my story!



**Plate A** Present-day view of the weir on the East Okement River which formerly provided the head for the Okehampton hydroelectric station. *(Photo by D.G. Tucker)*

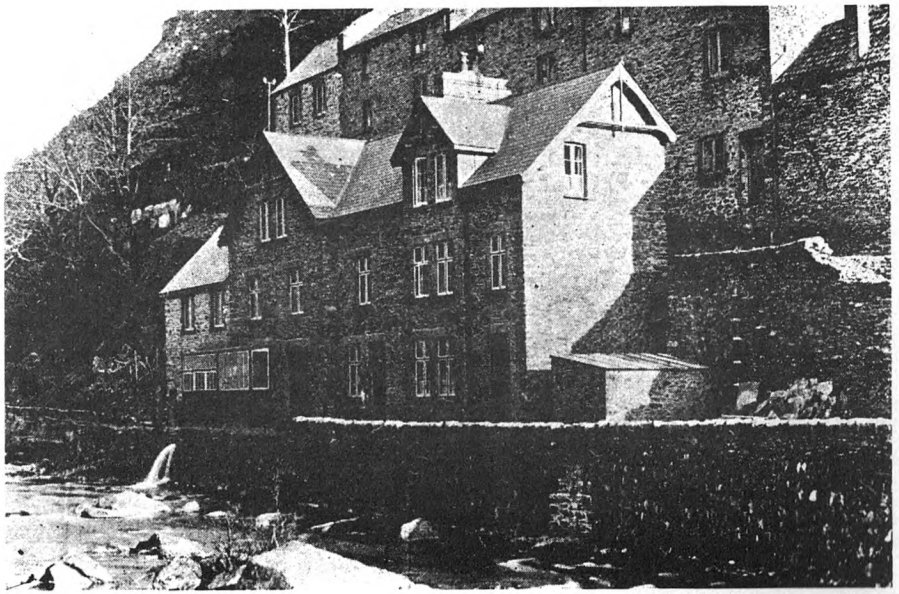

**Fig. 1** The hydroelectric station at Lynmouth in 1899. *(From* **Electrical Engineer**, *23, 1899)*

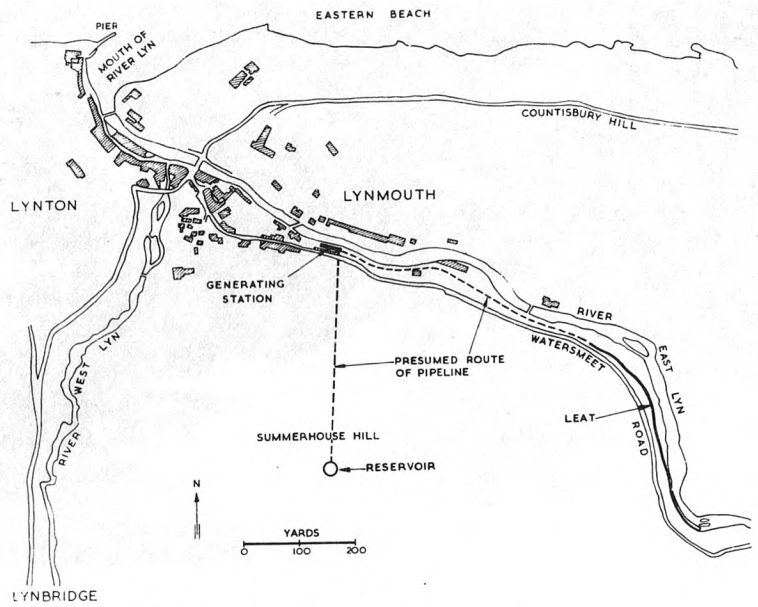


**Fig. 2** Map of the hydraulic arrangements at Lynmouth.

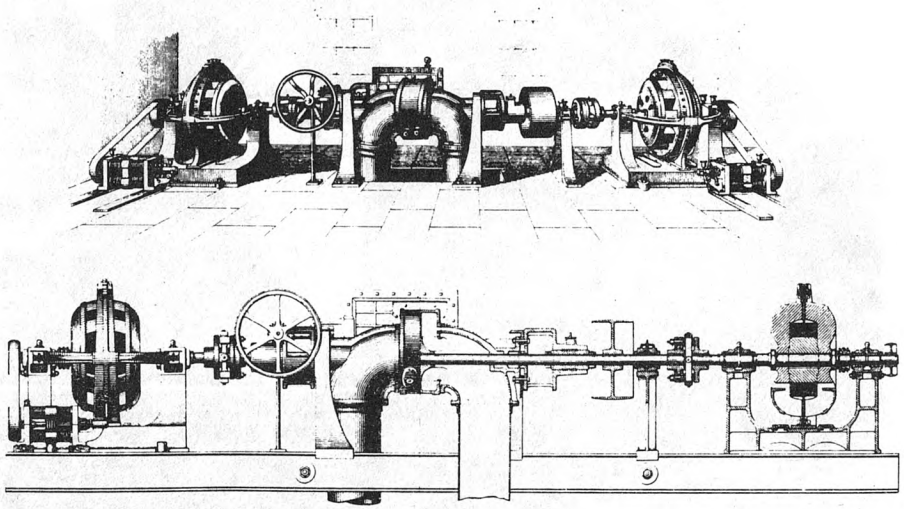

**Fig. 3** General view and diagram of the equipment at Lynmouth when first opened in 1890. *(From* **Proc.Inst.Civil Engrs.**, *102, 1890)*



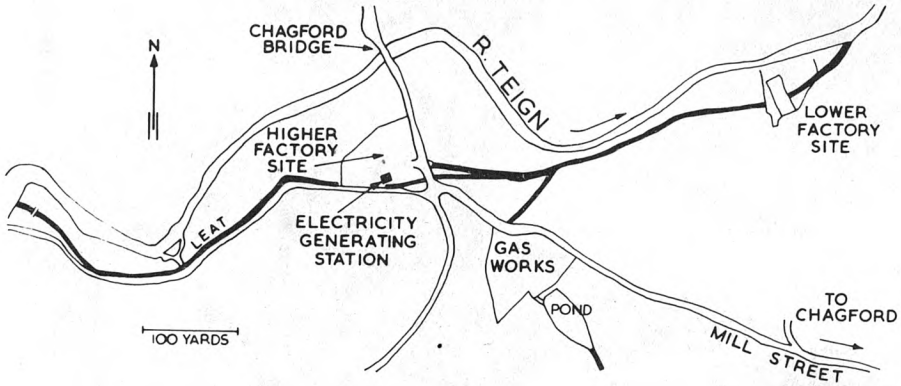


**Fig. 4** Map of the leat and generating station at Chagford.

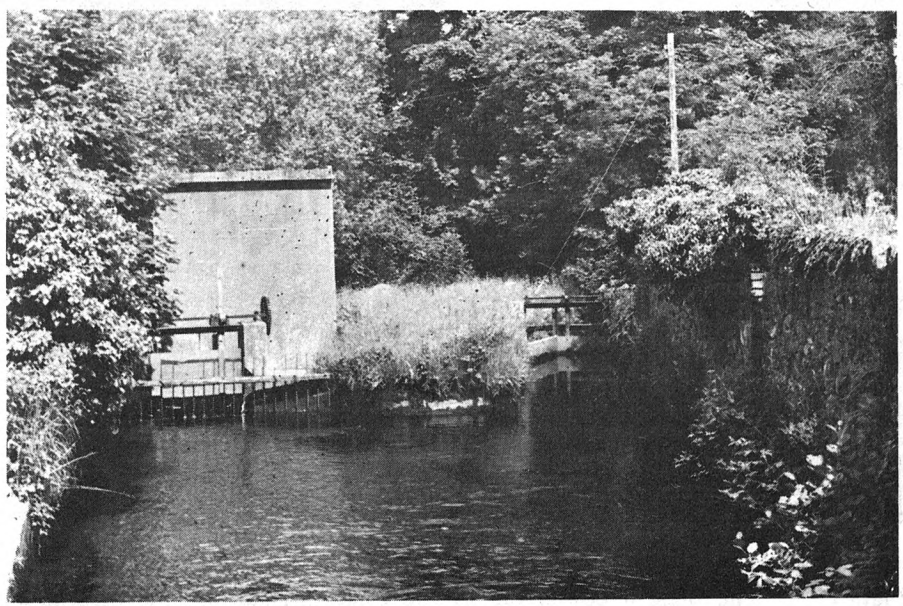

**Plate B** Present-day view from upstream of the hydroelectric station at Chagford. *(Photo by D.G. Tucker)*

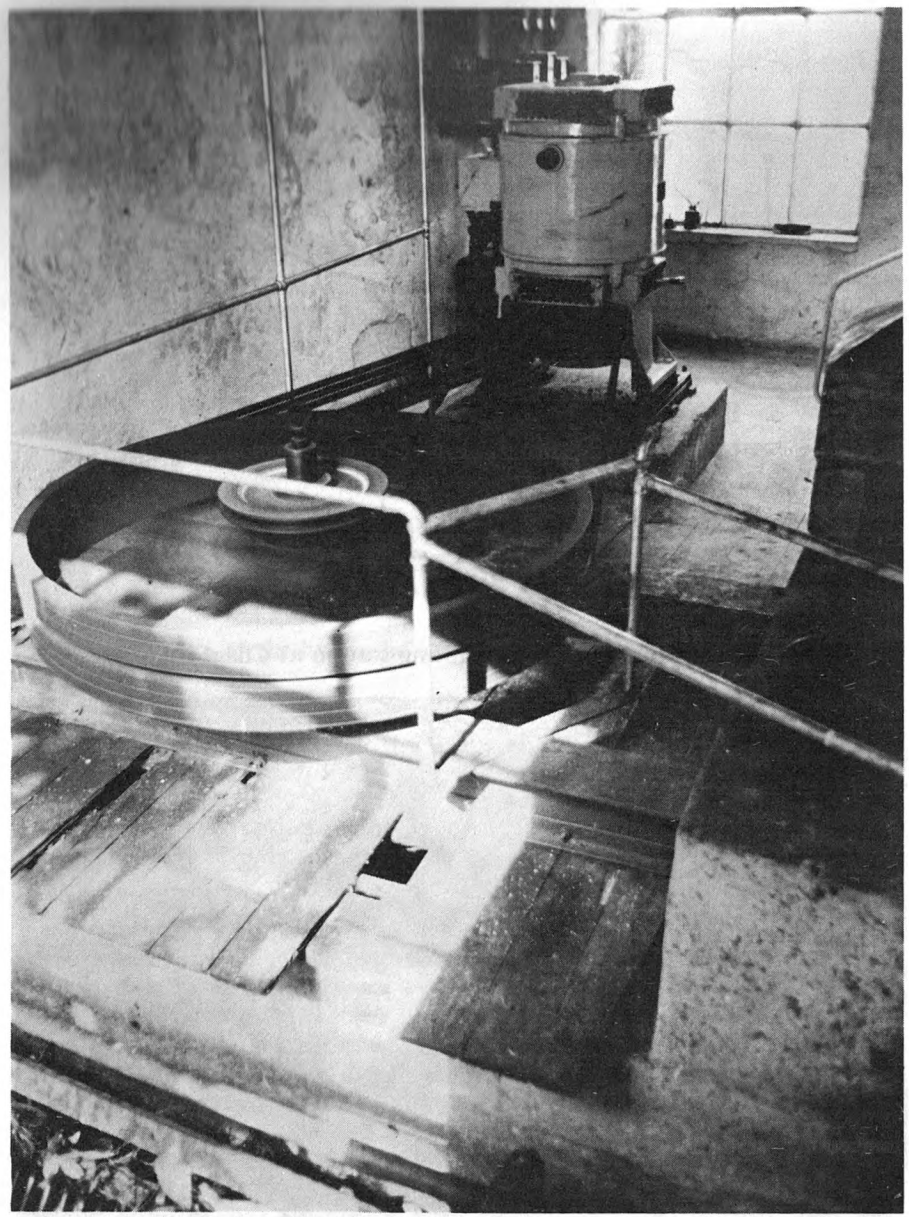

**Plate C** The present equipment of the Chagford station: the turbine is below the floor and directly coupled to the flywheel; the generator (26 kW, 420 volt, 3-phase, made by the Electric Construction Co.) is driven by belts from the flywheel. *(Photo by D.G. Tucker)*



## THE TIVERTON MUSEUM

**W.P. Authers**

Tiverton Museum, which this year attained an award in the national "Museum of the Year" competition, began modestly and almost casually in 1960. Having, as a newish town councillor, rashly undertaken to make an inventory of an accumulation of articles in the lumber-room of the Town Hall, the writer threw out the suggestion that a town of such historic association might sustain a local museum. This found immediate practical support from another councillor, Mr. V.J. Broomfield, who loaned two rooms in which to make a start. The acorn thus planted made rapid and consistent growth and we find ourselves today administering one of the largest and most comprehensive local museums in the West country.

That is not to say that the going was easy. Building up steadily meant that we soon outgrew not only the first two rooms but our second home, the 17th century Chilcott School in St. Peter Street. Then finally in 1969 we acquired the 19th century National Schools in St. Andrew Street. In three planned phases, these buildings have been converted into a museum complex which has to house and to display suitable exhibits ranging from tiny flints to bulky waggons and agricultural implements.

To make the original 1844 school premises structurally sound was the first task. When people congratulate us on having a building of historic and architectural interest which is itself a museum piece, we recall ruefully the trouble and expense such buildings involve. For instance, the floor of our large Agricultural Hall is of concrete because it was necessary to remove and burn every piece of wood to eradicate the various infestations of dry-rot, wet-rot, furniture-beetle and other well-established unwelcome guests. Equally unwelcome was the problem of condensation. This bane of all museums necessitated expensive heating bills for several years to ensure the walls were thorougly dried out. The problem is a continuing one.

The first phase was the conversion of the rooms on the periphery of the block — two large, lofty halls linked by two classrooms. Next, the headmaster's quarters, two rooms upstairs and two downstairs, were gutted to make two more useful galleries, for loan exhibitions and costume respectively.

The third and final stage was to build a two-storey annexe and a separate Waggon Gallery. The latter was designed by Mr. A.A. Cumming, Director of the Area Museum Council of the South West and Mr. Geraint Jenkins of the National Folk Museum of Wales, a leading authority on the English Waggon. Mr. Broomfield, as our Honorary Surveyor, worked on their basic ideas to provide an attractive and very functional building.

Thus the completed complex now comprises eleven galleries, a lobby, three courtyards (all in use) and there is the G.W.R. locomotive, the "Tivvy Bumper" on a separate site in Blundell's Road. The layout embodies the following sections: