The Swing

Up and down, in summer weather,
Like a bird on wing,
From a witch-elm bough together,
Through the air we swing;
Now in blue ethereal spaces
From the earth we pass,
Playing now with clouds at races,
Fringing now the grass.
Hearing all the whispered pleasure
Of the nested rooks,
Meeting eyes that guard their treasure
With indignant looks;
One swift moment with the swallows,
Then among the daisies,
Like the flying thought that follows
Fancy through her mazes.
Now we see the plough and harrow,
Now we drink the sky;
Now we watch the worms that burrow,
Now the stars on high.
But, with aspirations tending
Heavenward, from our birth,
Swing we ne'er so high, the ending
Brings us down to earth.

Hamilton Aïdé.

The Norwich Electric Tramways

By an East Anglian.

Lady Jeune, writing in the Christmas Number of the *Weekly Sun* of 1896, said:—'It seems to me that the real interest of Norwich centres in the Cathedral and the Maid's Head Hotel.'

Had her Ladyship waited till the year of grace 1900 she would probably have included the Electric Tramways.

Although the metropolis of East Anglia has been somewhat slow in adopting the latest and best mode of locomotion, it is not a little curious to learn that the ancient city was well to the fore in the matter of long-distance travelling nearly a century and a half ago.

In a charming little brochure entitled 'The Maid's Head Hotel; its history and associations 1287–1897,' by

ORFORD HILL AS IT USED TO BE.

W. H. Jones, there occurs the following highly interesting passage:—

'Our hostelry was connected with another department of the social life of the citizens which is of interest to us in the present day. Here departed, in "the good old days" of leisure and repose, when railroads and some other adjuncts of later life had not been dreamt of to yield our grandfathers the high tension, the wrack and wear of modern living—one of the many cumbersome but no less sportive and inspiring "machines" which issued from

Norwich upon the great main roads. The advertisement is sufficiently explicit ':—

NORWICH, March 26, 1762.

SUSAN NASMITH, and JAMES KEITH,

PROPRIETORS of the

NORWICH MACHINE

Give Notice,

THAT their Machine will set out from the MAID'S HEAD Inn, in St. Simon's Parish in Norwich, on Monday, the 5th day of April next, at half-past eleven in the forenoon, and on the Wednesday and Friday in the same week, at the same time; and to be continued in like Manner, on those Days weekly, for the carrying four inside Passengers, at Twenty-five Shillings each, and outside at Twelve Shillings and Sixpence each. The inside passengers to be allowed 20 lb. Weight, and all above to be paid for, at three half-pence per lb., and to be in London on the Tuesday, Thursday, and Saturday Evenings weekly.

N.B.—A Machine will set out on the same day, &c. at the same time, from the GREEN DRAGON in Bishopsgate Street, London, for Norwich.

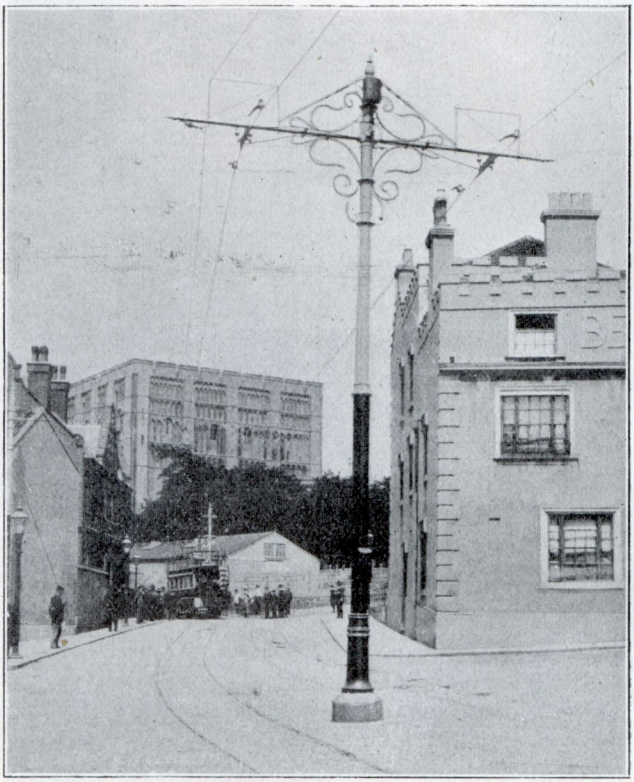
No long time after this announcement appeared (in 1763), the local public were further notified that 'the Widow Nasmith and James Keith having erected large and commodious machines,' to carry six inside passengers, 'reduced the fare to 20*s*., and outside fares to 10*s*., starting from the Maid's Head on the usual days.'

What were these 'machines'? Only horse-drawn conveyances surely, for in Great Britain the word 'machine' was used long years ago to denote any vehicle, such as a coach or a gig!

But the nineteenth century has changed all that, and within the last three years Norwich has undergone a remarkable transformation. With its narrow winding streets, many of them built in mediæval times, and with a population of 115,000 inhabitants, this typical old English cathedral city possessed not even a horse tramway; but under the direction of Mr. J. E. Winslow, the chief engineer of the New General Traction Company, plans were drawn up for a complete network of lines radiating

from the centre of the town to the outskirts in all directions.

The benefit to the city has been immediate and marked; congested thoroughfares have been relieved, new



ORFORD HILL, WITH VIEW OF CASTLE: CENTRE-POLE SUSPENSION.

streets constructed, narrow ways widened, and obstructions to traffic removed.

The power station is situated in the heart of the town, within a stone's throw of the electric-lighting station, Duke Street intervening; the site is conveniently placed on a bend of the River Wensum, which affords facilities for coal and water supply. The station itself is of red

brick, and consists of engine and boiler room, economiser room, test room, and coal stores.

The boilers are four in number, of the Babcock-

THEATRE STREET: SIDE-POLE SUSPENSION.

Wilcox 240 N.H.P. standard size, with double steam drums; each of them has a heating surface of 3,240 square feet. The boilers are fitted with Bennis mechanical stokers of

the ordinary type, and work at a pressure of 150 lb. per square inch.

There are four generating sets for producing the electrical energy for the working of the nineteen miles of track, each consisting of a Westinghouse railway dynamo of 200 kilowatts capacity (a kilowatt is equivalent to $1\frac{1}{3}$ horse power) direct driven by a Browett-Lindley horizontal engine of 300 H.P. of the tandem compound type.

Two of the sets are sufficient to cope with the ordinary

RED LION STREET: SPAN WIRE SUSPENSION.

load; on holidays, &c., three sets are used, the fourth being always in reserve.

The power-house, however, is of interest rather to the engineer than to the travelling public, so we will now concern ourselves with the tramcar and 'what makes the wheels go round.'

A glance at the illustrations will show that there is on the top of the car a long pole called the trolley-pole, which is kept in contact with the suspended overhead wires.

The electrical energy, or, as it is more usually called,

the electric current, is conveyed from the dynamos or electric generators in the power-house to the main conductors, termed feed-wires, which are laid underground, and from these to the overhead trolley-wires, which are supported by ornamental iron standards, set at the sides or in the middle of the road as the case may be, and which extend the whole length of the track.

On the end of the trolley-pole is a little wheel or collecting device, which takes the current from the overhead wire and allows it to pass down the pole, through wires in the framework of the car, to the electric motor fixed under the body of the vehicle; the armature, or revolving part of this electric motor, by means of gearing, drives the wheels of the car.

A piece of apparatus known as a controller is actuated by the driver, who by turning a handle can start, stop, and run at varying speeds. The track rails are connected at the joints by the Falk cast-weld system, and the current, after passing through the motor, goes by way of the car wheels to the rails, and so back to the dynamo in the power-house, thus completing what is termed 'the circuit.'

This method of propelling tramcars is called the trolley system; there are also other means of operating them, such as by the underground or conduit method, the surface contact, and the accumulator or storage battery systems, but to these there is no need to refer.

Although we in this country are years behind the more enterprising citizens of the United States in utilising the electric current as a means of street locomotion, there is at the present moment much activity going on in the direction of substituting the electric motor for the horse in many of our large cities, and Norwich gives a very fair example of the benefits to the populace which attend such radical and long-needed changes.

At the end of the nineteenth century there were forty-three electric tramways in operation on the overhead trolley

system in the United Kingdom, and thirteen in course of construction. There were also ten electric railways, as distinguished from tramways, in full swing, and two approaching completion.

The horse is doomed to disappear so far as street tramways in large cities are concerned, just as the stage-coach horse was doomed as soon as stage-coaches developed

RED LION STREET BEFORE WIDENING.

into railway carriages. 'The chief drawback to street locomotion,' said Mr. James Swinburne, in one of his diverting articles on 'The Electric Tramway and its Future,' 'is the horse. He has been with us over 5,000 years, and has not learned even manners or decency. He is nearly as foolish as the hen, and he is dirty and insanitary on a larger scale.'

T. E. GATEHOUSE, F.R.S.E.