

Development of Some Mechanical Inventions". His address, he said, followed a well-beaten track, but as many uncritical accounts and inaccurate illustrations have been published regarding the early history of pumps and engines, he thought it would be of interest to consider some of the earliest printed records. Recent research has shown that much less is known of such men as Ctesibius and Heron than our fathers thought they knew; and even in the case of Heron, the earliest manuscripts are posthumous to the extent of more than a thousand years. The first printed edition of his "Spiritalia" was in Latin and was published at Urbino in 1573. In this is described the first known application of heat to produce motion in fluids, a device for opening temple doors by the agency of heat, and the famous æolipyle. The word 'æolipyle' has been used by writers in three senses, namely, (1) for a vessel shaped like a retort for producing a jet of steam, (2) for Heron's engine and (3) for a wheel impelled by steam as invented by Branca. The word means the doorway of Æolus, that is, that of the cave in which the winds were kept. After touching upon some of the inventions described by Agricola, Porta, de Caus, Branca, D'Acres, von Guericke, Boyle and the Marquis of Worcester, Mr. Dendy Marshall made some interesting remarks on Papin and his invention of the safety valve. To the plug valve, Papin added the lever and moveable weight, but he did not propose it as a safety valve or hint that it might be useful to prevent explosions. From Papin, Mr. Dendy Marshall turned to the work of Savery and Newcomen on the steam engine, and concluded with some remarks on the early history of tramways, railroads and mechanically propelled vehicles.

#### Road Traffic in the United States

In a recent radio talk given over the Columbia Broadcasting System, Prof. S. S. Steinberg, of Maryland University, discussed the highways of the United States. With more than 25 million motor vehicles, the business of highway transportation is one of the largest in the country. Last year, holiday motorists in the United States spent almost 600 million pounds. Highway facilities are still far from complete; only five per cent of the three million miles of rural roads are hard-surfaced, while only thirty per cent have received any kind of improvement. In many places, need for reconstruction is urgent, and the mileage of secondary light traffic roads required is very great. The loss of life due to accidents is high, as almost a hundred persons are killed every twenty-four hours, and last year one out of every hundred of the population was injured in a road accident, one of the gravest risks being the 'railroad grade' crossings, of which there are 240,000. About 1,500 persons are killed annually at these crossings; at least 30,000 such crossings are dangerous, and it will take many years before they can be made safe. Congress has provided sixty million pounds of emergency relief funds for this purpose, and the development of 'farm to market' roads will be a great boon to the country. The work will provide

employment for many at present unemployed as the cost of constructing roads is mainly for labour. Mr. Robinson points out that the highways affect everyone vitally as they are the arteries which carry the life-blood of agriculture, commerce and industry, as well as bringing many social and educational amenities.

#### London and Home Counties Joint Electricity Authority

UNDER the Electricity Acts of 1919 and 1922, joint electricity authorities were set up, which were to be representative in these districts of the authorised undertakers, the local authorities, the county councils, the large consumers and other interests. In a pamphlet describing the opening of new electricity showrooms in Sutton, a list of those composing the Joint Electricity Authorities for London and the home counties is given, and a record of the progress that has been made since the Authority took over the undertaking. The list of the members is thoroughly representative, and wonderful progress has been made in developing the industry. By instituting two-part tariffs, assisted wiring and hire and hire-purchase schemes, the electric supply has been made available to the poorest people in the district served, which is mainly residential. The supply area covers 190 square miles and is divided into an inner and outer zone, consumers in the latter having to pay slightly more. The work was taken over in July 1932, and in July 1935 the number of consumers had increased by 89 per cent, the load having more than trebled. The Authority has done much useful work in standardising the apparatus and systems it has inherited. The whole of Surbiton has been changed from direct current to alternating current, and in Sutton the supply is being converted from 200 volts to the standard 230 volts. Practically the whole of the supply is being received in bulk from the Central Electricity Board. The bulk supply from the Grid is taken at 33 kilovolts, transformed at the Grid substations to 11 kilovolts and then transmitted to the Authority.

#### Climate and Health

At the Harrogate Congress of the Royal Institute of Public Health, Mr. L. C. W. Bonacina delivered an address on "The Study of Weather and Climate in Relation to Public Welfare", which has been published in the *Journal of State Medicine* (43, No. 10). He points out that the effect of climate on general well-being is so complex that it is not possible to discriminate between the different elements, but that in Great Britain the general effect is distinctly favourable. Hence it follows that the effect of a marked change of climate, even if superficially an improvement, as for example a doubling of the amount of bright sunshine, might not really be to our advantage. The great importance laid on sunshine is "probably only an exaggerated response to the evil consequence of smoke-vitiated light and air in the great industrial centres, and the curative results in proper doses of natural or artificial sunlight". The wind and the rain, by cleansing the air, are also of great value,