
CURRENT SCIENCE—50 YEARS AGO

Problems of Road Research*

AT the second session of the Indian Road Congress held recently in Bangalore, the delegates, mostly Engineers from the different parts of India, discussed more than thirty papers dealing with the various aspects of their departmental problems. Apart from this professional interest in the construction and maintenance of proper roads, the provision of increasing facilities for vehicular and pedestrian traffic must always be of the utmost importance to the general public. The introduction of motors which has initiated new Engineering problems, must produce even a more profound effect upon the social and economic life of the people than the Railways did before, and the greater range and mobility of these mechanically driven vehicles have brought about a transformation in rural India and in the general methods of transport. The basic facts and the elementary governing considerations of road problems are of such vital character as to necessitate the creation of a Ministry of Transport and a Road Research Board financed by the Road Development Account. The need for a Road Research Organisation is evident from two factors, *viz.*, the large amounts annually expended in India on the construction and upkeep of roads, and the large number of accidents associated with motor transport. The traffic problems are not confined to the technical and professional interests of the engineers alone, but they really belong to the domain of an applied science which includes not only Engineering but also Physiology, Psychology and Pedagogy.

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Generally speaking, the Indian roads are a standing menace to public health, acting, as they do, as the great carriers of infectious diseases. It is the common experience in all the Indian towns that the tarred roads during summer emit intense radiation of heat, parching up the air passages of nose and throat, which is a prelude to the onset of influenza and all other manifestation of bronchial and lung trouble. When the hot winds blow over such roads, carrying the dust particles

and other impurities, the eyes and mouth of the users of the road become involuntarily filled with them. In using any new road binders the road engineers and the public health authorities have to co-operate and conduct experimental work before they are employed on a large scale. Roads have always acted as a source of danger to public health, and all attempts at improving its conditions must be supported by a definite knowledge of experimental investigations in the research laboratories.

The most frequent cause of road accidents arises from the skidding characteristics of the surface. We have at present no knowledge regarding the general influence of vehicle design on skidding, and formal investigation in this direction and in its relation to some conditions of road surfaces becoming slippery is desirable as a means of preventing those conditions from arising. Roads accumulate various types of debris on their surface, and behave differently under seasonal and atmospheric conditions and all these have to be linked with the texture and composition of binders. Another factor which produces road accidents is psychological. The statistical data of accidents have been collected in a more or less mechanical fashion, and few psychological tests have been devised to investigate the human factors in accidents. What is the psychological basis of the various traffic regulations? Has the effect of these regulations on the driver and on the pedestrian generally been determined? It must be remembered that the driver of a motor car has to use the eye, the hand and the leg almost simultaneously and does his selection include any examination of how far these organs co-operate in a given situation and how speedily and correctly does his mind form the right judgment? How far does the habitual use of alcohol and narcotics affect the alertness of mind and steadiness of the eye, hand and foot? Equally important with these factors is irritability and impatience, as well as night and colour blindness and defective sight. In such fields of enquiry the psychologists and doctors have to co-operate in the design of traffic and car signals, in the framing of traffic regulations, in the illumination of roads and vehicles and in the selection and rejection of drivers.

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Clearly the pedestrian and the cyclist cannot be selected. They are in the habit of picking up their own methods of using the road, and since the traffic regulation is becoming scientific, arbitrary modes of using the road must always produce accidents. It is obvious that they, above all others, should be instructed how to avoid accidents from motor traffic. Instruction in schools and colleges and propaganda by private and aided agencies with a view to impart systematic training may produce the desired results. On the roads it is not uncommon to find the physically deformed and defective people, blind and deaf, old men and unsophisticated children sorely trying the patience of motor drivers, the motor cyclists and bicyclists. We have, on the other hand, villagers carrying head-loads, bullock carts carrying steel girders and bamboo poles, and beggars crossing from foot path to foot path, on sighting a car to stop. The

Indian traffic conditions are peculiar, and their control and direction must be based partly on research work and partly upon the education and enforcement of traffic regulations.

The importance of scientifically prepared and accident-free roads in India must become evident when it is remembered that more than fifty per cent of her population uses the road bare-footed almost from infancy to old age, imbibing into the system the dust and pollution of the road accumulations. Will such an existence improve the physical efficiency of the people? It seems to us that the multiplicity of problems involved not only in the construction and maintenance of roads, but also in the reactions of such roads on public health, must be the chief argument in favour of instituting a Ministry of Transport and a Road Research Board.

NEWS

FIRST-EVER POWER-TRANSFER LINE OF 1,150 KILOVOLT

The first 1,150 kilovolt power-transfer line of the world, 497 kilometres in length has been put into operation, linking Ekibastuz to Kokchetav in Kazakhstan. It is the first link in the major top-class line, which will connect the power stations of this fuel-and-energy complex with the Ural area.

Geographically, the power consumers are found mostly in the European parts of the Soviet Union, while the bulk of the fuel resources in its Eastern parts. Unprecedentedly, large fuel-and-energy complexes are taking shape on the basis of Western Siberian gas and Ekibastuz and Kansk-Achinsk coal. It is thus more advantageous to build power stations and transport electricity by long transfer lines.

Estimates show that prior to 2000 much more electricity than now will have to be transported from the country's East to the Ural area. Several parallel 500-kilovolt lines would have to be built for this

purpose, which is clumsy and costly. Meanwhile, one 1,150-kilovolt line has a throughout capacity of up to five million kilowatts. Simultaneously, the spending on wires, metal, pylon foundations and on building-and-assembly operations is more than halved, and the losses of electricity, too. Also, the lines thus occupy 2.6 times less land.

"The 1,150-kilovolt line is a major Soviet technological stride and a landmark in the development of world power engineering," said the First Deputy Minister of the USSR Power Industry and Electric Power Stations, Alexei Makukhin. "In 1986-1990, the Soviet Union will build several such power-transfer lines for linking the grids of Siberia, Kazakhstan and the Ural area," he pointed out. (*Soviet Features*, Vol. XXIV, No. 181, 5 December 1985; USSR Embassy in India, P.B. 241, 25, Barakhamba Road, New Delhi 110001).