

36 Transport-Communications

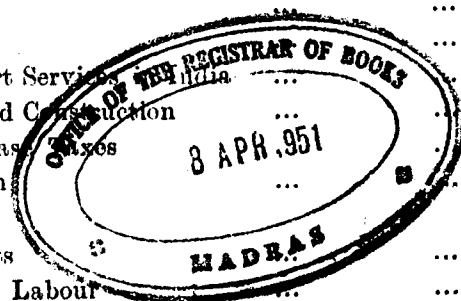
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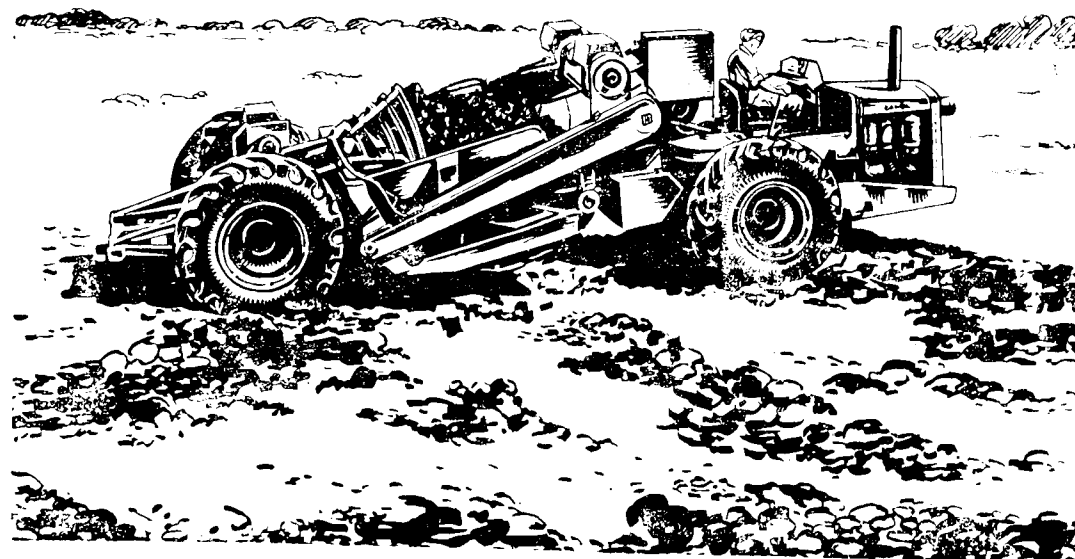
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Editorial Note

UNIVERSAL PROBLEMS

FOR three consecutive years the department of Main Roads, New South Wales, Australia, have recorded in their annual reports that high costs and lack of adequate supply of bridge-making materials and uncertain labour conditions have retarded bridge construction work. Not only have cement and steel been in short supply but also hard timber (owing to the competition of housing requirements) and paints for maintenance. Such humble things as bolts, wood screws, linseed oil, and buttons (reflector) are listed among things responsible for special delays. The result was that on the 30th June 1949 there were 31 old bridges on the Main Roads system closed to traffic "in the interest of safety" (23 in 1948) and a further 87 bridges (62 in 1948) on which traffic loads were restricted. It is obvious that peace arrears are being added to war arrears. Is it because one fighting war has given place to numerous cold wars that trade has not yet found its moorings?

Equipment has been difficult to obtain. This, in a country with a small population, is a serious handicap. The department's tractors purchased before or in the early stages of the war have been operating up to 13 years, including in some cases on continuous shifts on defence works during the war. Things have come to such a pass that it makes "news" when the

department gets two $\frac{3}{4}$ cubic yard power shovels of American manufacture.

Contractors who came up like mushrooms all over the world in the war years have disappeared. They are reluctant to tender for bridge construction under "existing conditions." In some cases contractors have abandoned half-done works for the department to complete. We in India are only too familiar with this reluctance and this sort of "passing the baby."

But New South Wales apparently foresaw this. The department of Main Roads has built up specialist bridge gangs, including the necessary "tradesmen," for maintaining and building its bridges. During the year ending 30-6-1949 tenders were accepted for only 13 bridges including six timber bridges in one single contract. Details are given of the arrangements made for construction by day labour of 27 bridges. This makes stimulating reading in what would otherwise be a dry as dust annual report.

Another "problem" which has carved a niche for itself in the annual reports is the "straying" stock, the Australian counterpart of India's Brahmani bulls. Figures of casualties caused by cattle straying on roadsides have been mounting from year to year and have shown a 50 per cent increase since 1946.

—o—

**We wish all our
Readers, Contributors, and Advertisers
A Happy and Prosperous
New Year.**

—o—

THE ROADS OF GREECE

(Extracted from 'The Hindustan Times' — July 17, 1950)

FIVE years ago you could hardly travel 20 miles outside Athens by road without wrecking your vehicle on pot-holed surfaces or in the stony river-beds where the bridges had been blown. Two years ago American contractors under E. C. A. (Economic Co-operation Administration) had taken the main roads in hand and given them a new surface which is probably better than any in South-East Europe.

But you still could not travel more than 20 miles outside Athens, because almost the whole countryside down to the hills overlooking the capital was threatened by Communist rebels. Today you can drive where you like, and on the main roads the only limitation (as anyone knows who has travelled in the new buses which have sprouted innumerable all over the country) is the maximum speed at which your accelerator, your brakes and your nerves combined can take the hair-pin bends. **The history of the roads, in fact, has been the history of Greece over the last five years, and it will continue to be so.**

In a country which is three-quarters covered with precipitous rock — where some towns stand higher than the highest peak in the English Lake District (about 3,000 feet) — where many villages have never seen a wheel, because there would be no use for it on their jagged slopes — it is obvious how important and how formidable a task is the construction of roads. Given a complete network of motor roads throughout the mountain provinces, a guerilla war such as the one just ended would be impossible; or if it ever began, an efficient army could break it up and crush it in a few weeks, as F.M. Papagos (Greek C-in-C) succeeded in doing last year. Given good roads, Greece's still unexploited resources could contribute to the country's economy; timber could be cut and transported to the plains, where it is urgently needed for re-building; mines could be opened and operated at reduced cost; produce could be carried to market by trucks instead of by mules or women, and so on.

Even more far-reaching effects might follow. The educational system could be

immensely improved if children could go to schools in the larger towns instead of being confined to the limited teaching of the village-school. Tourists might be attracted instead of being scared away by the difficulties of travel, and one of Greece's best industries revived. Above all, the valuable trend towards decentralization of government, which has already begun, could grow and spread deeper into the most primitive parts of the country with the help of adequate communications.

The Lesson Taught by Roads

The Greek authorities are aware of all this today. If so terrible a war as the one just ended can be said to have done anything good, it has at last made the capital aware of some of the problems of the country provinces — "i ypaithros" or "the outdoors," as they are characteristically called. Athens has even had to share some of the hardships of the last few years. The lesson of the roads is being bitterly learned in the capital itself. Five years ago Athens had the only usable roads in Greece, but since then practically no work has been done on them, and soon they may fall into the same condition as the main trunk-roads were in when the Americans came to the rescue.

Certainly there is no lack of awareness of the problem, and its importance, but even now it is doubtful whether the system of road communications can be kept at its present level of efficiency, still more whether it can be improved and extended as it should be. The dilemma which confronted the road-makers when they set to work three years ago was the dilemma of Greece, and it has still to be resolved. If the American contractors were to have reconstructed the roads for permanent use, as a first-class engineering project, they might have taken ten years and in less than one year the Communists would probably have overrun Greece. If they were to produce usable roads in time to win the war, they had to be content with a good temporary surface which would soon disintegrate unless it were

carefully maintained with great difficulty and expense.

Poor Maintenance

They chose the second course, for obvious reasons, but already the price is being paid. The Greeks, though incomparable at improvisation, are not good at maintenance. The beautiful surface of the main road from Athens to Salonika is already crumbling at its dusty edges. It is melting and creasing here and there under the merciless Mediterranean sun. It is being torn by tractors driving from one farm to another on caterpillar tracks, and disfigured by huge stones on the steep gradients, which lorry drivers put under their wheels when they stop, and never trouble to remove.

The heart-breaking spectacle of deterioration, so soon after the triumphant victory which the roads helped to win, is aggravated by the fact that, for very good reasons, different sections of the roads were entrusted to different authorities, American contractors did the stretches between towns; town authorities were given grants from E.C.A. counterpart funds to do the

stretches within their towns; and the imaginative programme of "Community Development Employment," devised by the United Nations Welfare Mission, provided for second and third-class roads connecting outlying villages with the trunk roads.

The Challenge

It is now possible, at least in the summer, to visit by roads of a sort many parts of the mountains which were until now inaccessible. But one look at a great many of these roads is sufficient to show that without an immense and continuing labour of maintenance, the successes achieved will disintegrate and crumble away in a very few years; it may even be a matter of months.

And there is a real danger that with the roads the Greek State will again disintegrate, just as with the reconstruction of the roads it spread its authority and won its greatest victory. From now on the State of Greece can be exactly measured by the state of the country's roads, for they will exactly reflect it. The response to this new and continuing challenge remains to be seen.

PATRIOTISM

"Patriotism is the last refuge of the scoundrel."

Dr. Johnson, 1709—1784.

DIDN'T MATTER

A young couple were looking into one another's eyes and sighing soulfully, when Sandy said, "Ye ken, Jean, I'm no' much tae look at." "Oh, that dis'na matter," said Jean, "ye'll be oot at yer work maist (most) o' th' day."

* * *

ROADS AND "GROW MORE FOOD"

(Extracted from the Monthly News Letter of the Indian Roads and Transport Development Association—Nov. 1950)

THAT no cure for India's alarmingly poor agricultural output can be successful unless there are enough roads in the country and that half the battle in India's grim struggle to feed the nation can be won by constructing more roads is the gist of a letter sent by the Association to the *Economist* of London on 11th November. The letter was written with reference to two articles appearing in that paper (dated the 28th October and 4th November), entitled "Cures for India's Poverty" in which various remedies were prescribed for increasing the agricultural yield in India including the use of fertilisers, irrigation works, consolidation of holdings, extension of educational facilities, etc.

"The low yield per acre in this country has for long been a subject for study and discussion, and the suggestions for improvement put forward by your contributor are indeed very sound," the Association's letter said. "In connection with fertilisers particularly, their importance has been fully appreciated and more recently members of the Indian Government in launching their "Grow-more-food" campaign have stressed the necessity for more and improved fertilisers."

Too Little Attention Being Paid to Roads

However, in preparing schemes for increasing food production, too little attention has been paid, the Association pointed out, to the important, nay, decisive part that improved road communications must play, if any of their plans are to bear fruit.

"Without boring your readers needlessly with statistics, I can say with no fear of contradiction that the existing Indian road system is pitifully inadequate for a country of the size of India, with a population that is very nearly the largest in the world. Your readers will be surprised to learn that even in the progressive State of Bombay over 40 per cent of the total area is not served by

roads at all and over 70 per cent of the villages are isolated during the monsoon.

"Today, in spite of the stringent food situation, hundreds of thousands of acres remain uncultivated. An inadequate watersupply is not always the main reason for not putting this land under the plough. **In the majority of cases it is the total absence of roads, and the consequent high cost of transport, that makes it a commercially unprofitable proposition for the peasant to till the land in inaccessible areas.**

"Early last month, the Chairman of the Tuticorin Municipal Council in South India said the Municipality was producing compost, but no appreciable sale was being effected as the cost of transport from the town to the farms in the villages was prohibitive.

Perishable Foodstuffs Rot in the Fields

"Moreover, although we speak of growing more food, thousands of tons of perishable foodstuffs rot in rural areas each year for want of modern transport facilities.

"Again, absentee landlordism, which is the root cause of the decay of agriculture in many areas, is an evil that can be directly attributed to poor communications. The wealthy landlords migrate to the towns because the rural areas, being unconnected by permanent roads, lack the amenities and comforts of civilisation.

"Your correspondent, I notice, says that more schools and better health will make the peasants receptive to new ideas, but can any scheme of health services improve the health of the people generally unless there are good roads to connect the rural population with doctors and hospitals? Similarly, can a network of schools serve the villages adequately unless the school children of rural India can reach them quickly and safely?

Roads the Keystone

"Efficient transport, then, is the keystone in the arch of Indian agricultural prosperity, and unless priority is given to road-building, financial assistance from Point Four or Colombo Plans or any other source will fail to solve adequately any of the serious difficulties confronting us today. Better methods of transport and roads to carry the transport vehicles

are our prime needs. The roads are to a nation what arteries are to the human body.

"Half the battle will have been won in the grim struggle to feed the nation if Government goes ahead with the construction of roads, shelving for the present such costly sociological experiments as Prohibition."

—o—

IF YOU ARE LONELY

The contractor was far from home, the job was tough, and everything seemed to be going wrong.

Returning to his hotel that night, he reached for the Bible that had been placed in his room. Pasted on the inside cover was a sheet which said:

"If you are lonely and discouraged, read Psalms 23 and 27."

The contractor turned to the 23rd Psalm and read it through. Turning the page to read the 27th Psalm, he noticed a pencilled note in the margin, written in a scrawled feminine hand. "If you are still lonely," it said, "phone Cent. 1864."

—o—

DOCTOR'S DILEMMA.

Distracted Wife (at bedside of sick husband): "Is there no hope; doctor?"

Doctor: "I don't know. What were you hoping for?"

* * *

Patient (nervously): "And will the operation be dangerous, doctor?"

Doctor: "Nonsense! You couldn't buy a dangerous operation for £30!"

* * *

First R. A. F. trainee (as plane goes into a spin): "Quick, what do I do now, Instructor?"

Second R. A. F. trainee: "Great Scott! Aren't you the Instructor?"

—o—

Reorganisation of Road Transport Services Progress upto September, 1950.

[A report concerning only "Part A" States appeared in our issue for January 1950. This Article reports further progress made in these states, and also outlines the situation as regards "Part B" and "Part C" States..... Ed.]

Bihar

With the merger of Seraikella and Kharsawan with Bihar, the State Government have taken over the transport services formerly operated by the rulers of those areas and are operating them departmentally.

Bombay

It has been mutually agreed upon between the State and Central Governments that the dividend from the Bombay State Road Transport Corporation should be limited to 5 per cent and the profits over and above this percentage utilised for the provision of amenities to the travelling public, welfare of the employees, and road development. In the Bombay State Road Transport Corporation, the Railways have so far invested Rs 101.70 lakhs representing 25 per cent of the capital. The State Transport Services are operating over almost all important routes throughout the State. At the close of the year 1949-50, the Corporation had made a profit of Rs 21.3 lakhs and was operating 396 routes covering a route mileage of 12,799.

Madhya Pradesh

The scheme outlined by the State Government envisages the formation of five undertakings for the different areas in which the railways will be allowed to participate financially to the extent of 25 per cent. Meanwhile, the State Government are directing their efforts to place on a sound footing the two road transport companies already working with which the railways are associated. These two companies carry roughly one-sixth of the bus passengers of the State. At first, these companies were working at a loss but now their financial position has improved. With a view to rehabilitate the Provincial Transport Company, its capital is being raised from Rs 10 lakhs to Rs 30 lakhs.

Madras

The strength of the fleet of the State owned Madras City bus services has risen to about 322 vehicles covering a total daily route mileage of 35,308. The daily average number of passengers carried is about 2.14 lakhs.

Reorganisation of the road transport services in the rural areas is under consideration.

Orissa

The services introduced by some of the Indian States before their merger with Orissa are now being run departmentally by the State Government. The scheme outlined by the State Government for the re-organisation of road transport services envisages the formation of tripartite companies in which the capital investment will be contributed by the State Government, Railways, employees of the companies, operators and the general public. A start is proposed to be made with the formation of a company in the Ganjam region with effect from the 1st January, 1951, with an authorised capital of Rs. 15 lakhs.

Punjab

The State Government are preparing a scheme in which they propose to give the Railways a financial interest of 20 per cent in road transport services. Pending the finalisation of the scheme, the Government has recently decided to take over the Jullundur-Amritsar route, one of the most important routes in the State. Further, the existing services have been extended to Nakodar and Tarn-Sarhali-Gharka Chola Sahib.

The Government has also decided to run a local bus service in Ambala to which will be added the Ambala-Shahbad-Karnal, the Ambala-Jagadhri-Saharanpur,

the Ambala-Pehowa, the Ambala-Simla, and the Ambala-Patiala routes. There will now be 84 vehicles operating from the head-quarters at Amritsar, 50 from Jullundur and 29 from Ambala. This new scheme has been implemented in the case of the Amritsar Omnibus Service and the Jullundur Omnibus Service and was proposed to be put into effect from September, 1950, in the case of the Ambala Roadways.

The total capital expenditure involved in the operation of these services during the current financial year is estimated at Rs 24,47,500/- and recurring at Rs 50,19,500/-. The total anticipated net profit from these services will be about Rs 6,50,430/-.

Uttar Pradesh

The State Government are running transport services on a very large number of routes on a departmental basis pending a decision on final set-up of the reorganisation. The State Government is considering the report of the *ad hoc* Committee that was appointed a few months ago to advise on reorganisation of its transport services. Meanwhile, to regularise the departmental operation of its road transport services, the State Government have introduced the U. P. Road Transport Bill, 1950, in the State legislature.

West Bengal

The fleet of the State Transport (City Bus) Services in Calcutta has increased. A Directorate of Transportation has been set up to work out a scheme *inter alia* for the reorganisation of passenger transport in the City of Calcutta and for the Co-ordinated development of rail, road and inland water transport in the State.

PART 'B' STATES

Hyderabad

Since 1933, a State-owned Road Transport Service has been in operation more or less on a monopoly basis. It was taken over on an agency basis by the Railway Board with effect from the 1st April, 1950 along with the Nizam's State Railway. Only on a few roads are private services operating. The route mileage served by the State Services is more than 5,000.

Jammu & Kashmir

Motor transport is run both by the Government and public transport companies in the proportion of 50 : 50 on all routes.

Madhya Bharat

On some of the important routes, the State is running its own passenger transport services under the name "Madhya Bharat Roadways".

Mysore

The State Government operate passenger transport Services on a number of routes based on Mysore.

P. E. P. S. U.

The State Government are preparing a scheme for the reorganisation of their road transport services.

Rajasthan

The State Government are preparing a scheme and meanwhile have introduced Government owned services on some routes.

Saurashtra

The State Government have recently started departmental operation on a few routes.

Travancore-Cochin

The accepted policy of the State Government is progressive nationalisation and they have already taken over transport services on some of the main routes. They have nationalised a number of the transport companies. The displaced operators have been allotted alternative routes.

PART 'C' STATES

Ajmer

The Local Administration have prepared a scheme for the formation of a joint stock company which provides for shares as follows :—

26 per cent shares to go to the State Government ;

25 per cent to Railways ;

10 per cent to local bodies ; and

39 per cent to private operators.

Bilaspur

The statutory Local Authority which was established by the former Ruler is running the transport services on a managing agency basis. The fleet consists of 10 vehicles only. Steps are being taken by the Local Administration to terminate the managing agency system.

Delhi

The transport services originally operated by the Gwalior and Northern India Transport Co. in Delhi and its suburbs were taken over by Government on the 14th May, 1948, and run departmentally under the administrative control of the Ministry of Transport upto 31st March 1950, when they were transferred to the Delhi Road Transport Authority, a statutory body constituted under the Delhi Road Transport Authority Act, 1950. The Authority is a mixed body of official and non-official members. The Central Government provide such capital as the Authority requires from time to time.

The Authority has also powers to raise loans from the public with the approval of the Central Government. Its fleet consists of about 260 buses and, during its departmental operation in 1948-49, a profit of about Rs 9 lakhs accrued to government.

Himachal Pradesh

Almost all the services in the State are operated departmentally by the Local Administration.

Kutch

A State-owned transport service is plying in the State under the management of a non-statutory transport body consisting of officials.

Manipur

The Local Administration run, with a small fleet, a motor transport service which was originally introduced by the former Ruler of Manipur.

Then there was the keen motorist who became interested in a certain lady who, he was told, was full of the motoring spirit.

The American deflated his interest by asking if by "the motoring spirit" he meant "gas"!

HOLTER SYSTEM OF CONCRETE ROAD CONSTRUCTION

(Extracted from 'Concrete' — August, 1950)

Segregation Prevented

The Holter system is conceived with a view to preventing segregation of the concrete materials, which happens when these materials are dumped on the roadbed. The problem of how to obtain a homogeneous mixture has been solved in the following way: Only cement, sand, and water are mixed in stationary mixers and brought to the road by truck in specially constructed bottom-emptying tubs. By means of a self-propelled crane, running on the sideforms, the tubs are emptied into a hopper which automatically feeds the road with the necessary amount of mortar. By moving the spreader forward the layer of mortar will be evenly distributed by a special oscillating screed. A second hopper, which is also fed by the crane, follows and distributes the gravel or broken stone in the desired thickness.

When the materials have been deposited, they are subjected to the action of two connecting sheeps-foot rollers moving to and fro over the materials. During the process the top-layer of stone is pressed in to the subjacent mortar, which in turn works upwards. After approximately 20 minutes' work with this machine a thoroughly mixed concrete with an exceptionally low water content is obtained.

The next operation is to subject the concrete slab to the action of a heavy smooth roller, which compresses the concrete and expels air if present. The position of the rollers may be adjusted to the required height so as to obtain an even and controlled surface. At this stage of the work the joints are set. Then the process is completed by means of three tamping machines, two of which work in a diagonal and one in a transverse direction. The number of beats may be regulated within the range of 120-250 per minute, and the height of the tamping shoe may also be regulated to give the desired impact. The surface finish is

NORWEGIAN road builders have since the war been extending the use of a national method of road construction known as the "Holter" system after the late A. Holter, one-time president of the International Union of Cement. The Holter system, based on experiments which led to the discovery of a new process for preparing concrete, has stimulated the development of a new type of road-making machinery.

The essential feature of this system is a better utilization of the cohesive properties of portland cement, achieved by more thorough kneading and compressing. This process not only produces a concrete of greater durability but permits the use of coarser aggregate without diminishing the tensile strength of the concrete. Roads paved according to the Holter system can be opened for traffic after only ten days and the necessity to restrict the traffic to half the width of the roadway over long periods is thereby avoided.

Experiments, which were first carried out in 1933, proved that the hardening of the concrete was accelerated and its strength improved by a prolonged mechanical preparation of the compound involving alternate kneading and compression. Use was made of the fact that hardened cement, if ground into a fine powder with water added, will set again, but its strength will naturally be inferior to that of the original concrete. As this process may be repeated several times, it is obvious that as first hardened the cement embodies a certain amount of unused cohesive strength which could be exploited by applying a suitable method. The explanation of the above phenomenon is not far to seek: as cement is combined with water, a waterproof colloidal film is formed around every grain of cement preventing the water from penetrating into the cement kernel. This film will impede hydration if not broken down by agitation.

applied by a smoothing templet, working sidewise along with the last tamper.

When the machines have completed their work, the concrete is so hard that one may walk on the surface almost without leaving a mark, and the mass shows no tendency to flow, a fact of great importance where the road is built with super-elevated curves.

Salient Feature

The salient feature of the Holter system is that it mixes and activates the aggregates on the road itself. This is the most practical way in which the enormous volume of materials required for road surface can be treated so as to transform the larger part of the cement into a binding colloid. By this system only 50 per cent of all materials have to pass the mixing plant and, as already stated, the problem of how to avoid segregation when dumping the mixture of the roadbed is apparently solved.

The Holter system has been applied to a great variety of stone materials. Use has also been made of stone of inferior quality as such is often procurable in the vicinity at low cost. Even such inferior material yielded a remarkable good concrete, justifying its use on medium traffic roads.

Remarkable Strength

Tests carried out on cores drilled from different Holter concrete roads in Norway have shown comparatively high compressive strength in relation to cement consumption. The average compressive strength found on 11 different roads was 7,150 lb per square inch at six months and with 460 lb of cement per cubic yard.

Out-Put

With one set of machines, 1,800 to 1,900 sq. yd. of pavement with a slab thickness of 5 in. may be laid per day of 8 machine hours using a labour force of 22. This assumes adequate mixing plant capacity and a sufficient supply of materials. Allowance should be made for deviation up to 35 per cent depending on weather conditions and disturbances caused by traffic.

The Holter system uses no reinforcement on the concrete. It is a recognized fact that, as the traffic causes alternate stresses, reinforcement has little effect unless used in large quantities. It is for this reason considered more economical to calculate the slab thickness so that it can resist the traffic load without reinforcement.

Advantages of the system

The advantages of the Norwegian system can be summarized as follows:

1. A substantial part of the coarse aggregate, which possesses the greatest wearing strength, remains on top of the pavement, thus giving a more homogeneous and enduring surface.

2. Compared with other methods now in use, construction costs are approximately 20 per cent lower due to the following factors: (a) cement consumption is approximately 15 per cent smaller; (b) there is a saving on cheaper coarse aggregate through lower transport costs as the coarse aggregate does not have to pass the mixing plant; the capacity of the latter can therefore be reduced to half of what is required when other methods are used; (c) shorter period of construction and consequent saving of labour costs.

Wide use of the system

Norway has been making extensive use of the Holter system, 53 per cent of the total area paved with concrete being of the Holter type. The Holter system was first adopted in 1935 about the same time as the Vibro system. Since then 350 thousand square yard of road surface were paved with Holter concrete representing 73 per cent of all concrete roads built during this period. Since the last war the Holter system has been used to surface over 90 per cent of all concrete roads built in Norway. In addition, approximately 150 thousand square yard Holter concrete has been laid on Norwegian airfields including the nation's largest Sola-Stavanger where the concrete surface has now been used for fourteen years. The tarmac here is only 3½ in. thick, but is still in good condition and serves as runway for medium passenger planes.

(Continued on page 18)

BRITISH INCREASE GAS AND PURCHASE TAXES

[Extracted from "Fleet Owner"—June 1950.]

BRITISH taxes on gasoline and other motor fuels derived from petroleum are to be doubled under the budget introduced recently by the Chancellor of the Exchequer, Sir Stafford Cripps. Basically, the increase will be the equivalent of an additional 10 cents per gallon.

Gasoline now costs 42 cents a gallon. This change has been foreseen as practically inevitable, to make good the higher cost to the national economy of petroleum products imported from dollar areas. The higher cost was a consequence of the devaluation of the pound sterling.

Indigenous oils and gasoline substitutes, which were formerly tax-free, will be taxed 10 cents a gallon.

Commercial vehicles, which were free of purchase tax, now will bear a 33½ per cent purchase tax.

As a "concession" the Chancellor will allow the "basic" gasoline ration (i.e., for the normal motorist who uses his car only for pleasure) to be doubled beginning June 1. This new ration will allow the pleasure driver 180 miles a month instead of 90.

Will Yield \$204 Million

The increase in gasoline tax and the larger basic allowance are estimated to yield the Exchequer \$191.8 million in 1950 and \$204.4 million in 1951. This will nearly balance out the concessions on personal income tax also granted in the budget—which in the main affect those individuals earning between \$22 and \$33 a week.

General view taken by industry of the budget provisions is one of concern over the increase in distribution costs that it will produce.

Hardest hit will be firms using their own trucks for haulage. They will have to pay both the higher price for fuel and one-third more for vehicles.

Britain's surface transport operations, nationalised since January 1, 1948, also face the same increases in operating and capital costs. Overnight, the British Transport Commission faces an \$8.4 million increase in its fuel bill. Biggest

share will be paid by the Commission's Road Haulage Executive, which has virtually completed its acquisition of trucking firms engaged in long-distance haulage, which it tapped for nationalisation. It now owns a fleet of upwards of 37,000 vehicles. When replacements to this fleet become necessary, they will cost the RHE 33½ per cent more.

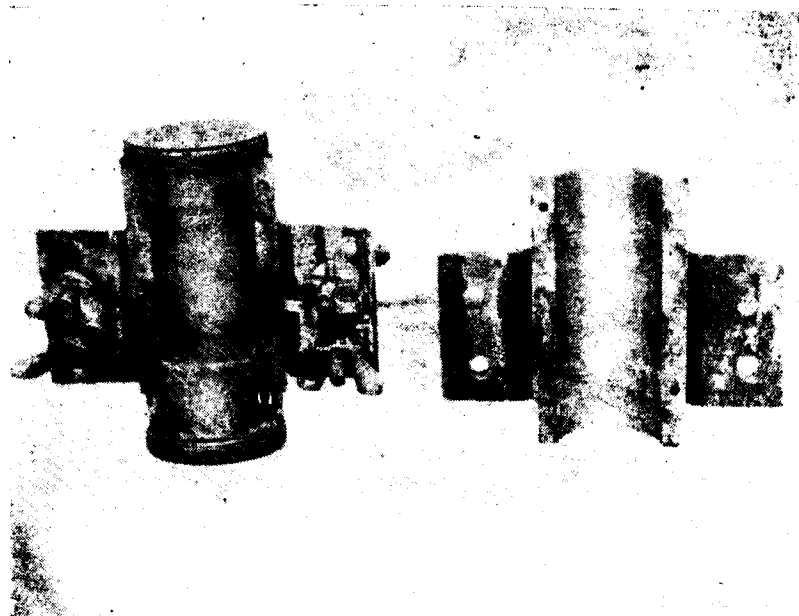
Universally, the effect of the tax change (and probably also its deliberate intention) will be to force traffic from the roads onto the rails. The nationalised railways already are suffering from declining freight revenues, and since November have had pending an application for 16½ per cent increase in rates.

Meant to Spur Exports

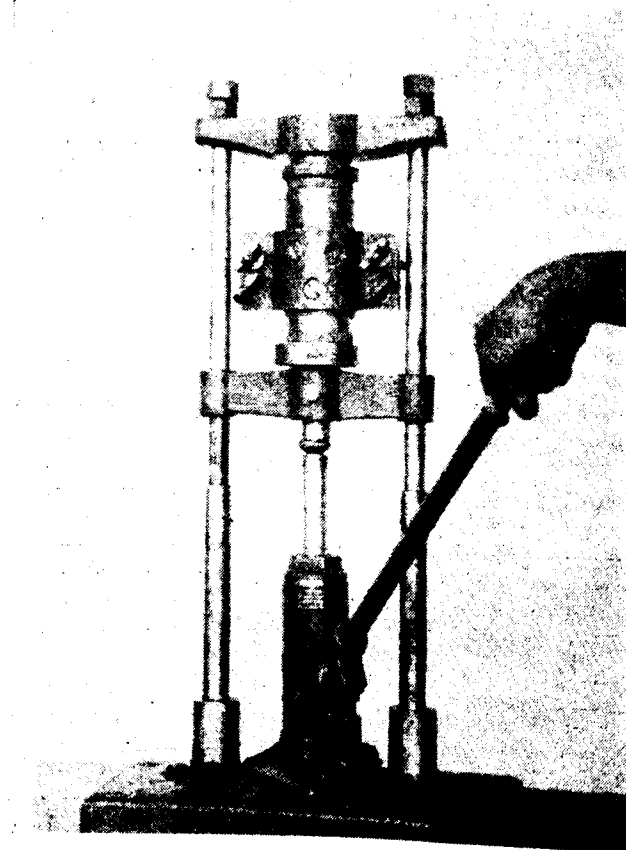
Reason for imposing the 33½ per cent purchase tax on commercial vehicles was given by Sir Stafford: Too many such vehicles are going into the home market. The "target" set by the government planners for 1949 was 50,000 vehicles for home customers. Instead about 100,000 were actually produced for this market. The new tax was intended to "assist" the industry to divert more of its output for export.

An official of one truck manufacturer stated: "Prices are very tight abroad, and we have had to depend for our eventual profit on sales in the home market."

Commenting on all this, the Financial Times says: "The new imposts on road transport may well prove to be the thin end of a wedge, the first of a series of moves designed to impose burdens on the country's road transport and to reduce the competitive advantage it has gained over the railways. A policy which piles fresh handicaps on efficient operators instead of applying the whip to the inefficient cannot be construed by any stretch of the imagination as a solution to the country's urgent problem of keeping down its costs and prices. The policy of soaking the rich for the benefit of the poor has been carried to its uttermost limits. Is it now to be replaced by a policy of strangling the efficient for the benefit of the inefficient?"



Photograph 1. Constant Volume Split mould for making Specimens.



Photograph 2. Jack Assembly for making Specimens.

LUCKNOW ROAD RESEARCH STATION

REALISING that research is essential not only to keep pace with developments in other countries but also to resolve numerous day to day local problems, the Uttar Pradesh Government have installed a well equipped Research Station at Lucknow. The scheme was sanctioned in 1947 and a small laboratory started functioning soon after.

The new building for the Research Station, costing about rupees two lakhs, is now almost complete, and the Laboratory has shifted there. Equipment worth about a lakh of rupees has already been received from the U. S. A. and equipment worth Rs 60,000/- is expected shortly. When completed the Research Station will have full facilities for testing and conducting research on soils, concrete, aggregates, bitumen and other building materials.

In addition it will have a photographic section, a constant temperature room, a workshop, a library, and a museum.

The whole scheme will cost about Rs 7,85,000 and has been phased for completion in five years i.e., by 1952. The work done so far has been mainly in connection with soil stabilization for low-cost roads and buildings.

Owing to limited facilities at present the work done in the Laboratory till now has been mainly of a preliminary nature. An interesting investigation on water proofing of fine grained soils is in progress at present.

Also, stabilized soil houses of the *pise' de terre* type, pre-cast cement concrete hollow blocks and R. C. pillar, and panel type houses have been constructed for housing refugees at Lucknow.

Road Research

Recently several road failures have been noticed in the Meerut, Buland-Shahar and Sitapur Districts. The following table gives the characteristics of the subgrade soils :—

Particle Size Analysis :—

Coarse	(2.00 mm—0.2 mm)	5 per cent
Fine Sand	(0.2 mm—0.02 mm)	57 per cent
Silt	(0.02 mm—0.002 mm)	20 per cent
Clay	(<0.002 mm)	18 per cent
		100 per cent

Specific gravity of soil particles 2.51

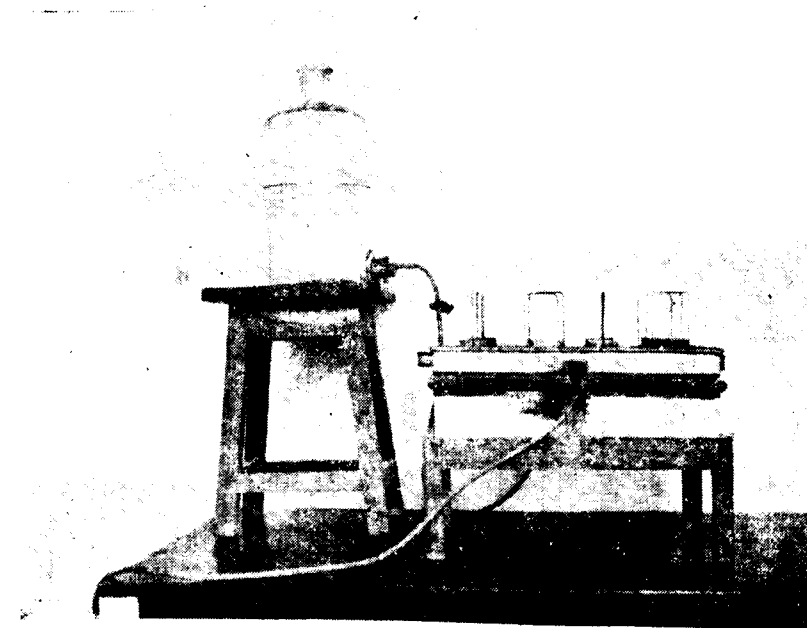
Consistency Limits:

Liquid Limit.	23
Plastic limit.	15
Plasticity Index.	8
Compaction test. (Standard Proctor's)	
Maximum dry density.	120 lb/cu. ft.
Optimum moisture.	15 per cent

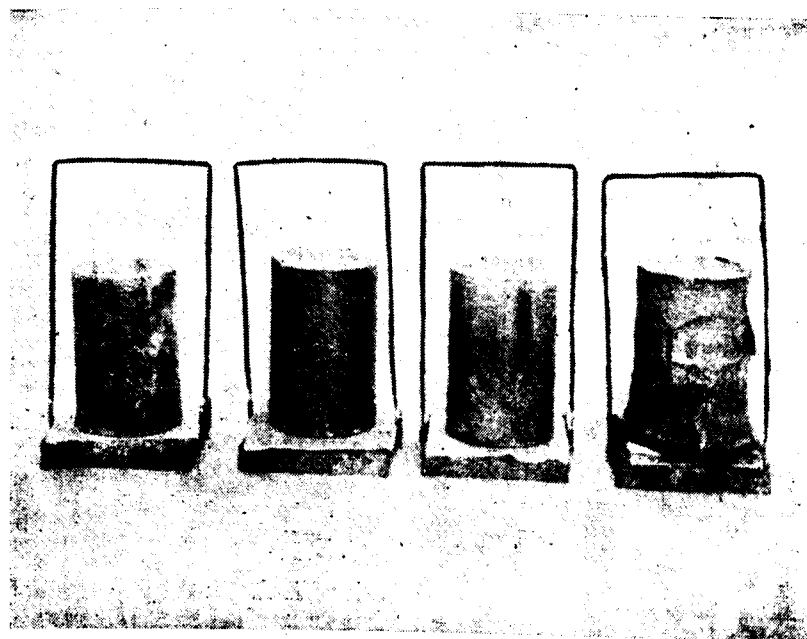
Laboratory tests:

As it was thought that these failures were due to capillary absorption of moisture by the subgrade soil experiments on waterproofing methods were undertaken. Various kinds of oil cakes were tried as waterproofing agents and after some preliminary tests it was decided to use linseed oil cake in further investigations. Extraction tests on this material showed that it contained 6 to 7 per cent of residual oil.

In order to assess the degree of waterproofing imparted to the soil, a capillary water absorption test was used. Cylindrical blocks 3 in. long and 2 in. in diameter were made using a split-mould and compacting at constant pressure in a hydraulic press. The entire apparatus used in this investigation has been manufactured locally. (See Photographs 1 and 2.) The test blocks were of uniform density and contained 10 per cent air voids. The curved surface of the blocks was coated with paraffin wax and the blocks were cured for three days. Blocks were made both with the stabilizer and without it. These were then tested by placing them in perforated trays over water under a constant head of 2 mm. (See photographs 3 & 4.) The amount of water absorbed was determined by measuring the increase in weight after periods of one, three, seven,



Photograph 3.
Capillary water absorption test.



Photograph 4.
Soil specimens after absorption; specimen on extreme right shows failure caused by absorption

and fourteen days. Full details may be seen in Indian Roads Congress Journal, Volume XV-part 3.

Further work is in progress and would include a study of the following:

- (1) Effect of pH of soil.
- (2) Effect of curing time.
- (3) Effect of residual oil content.
- (4) Effect of temperature and humidity.
- (5) Change in soil characteristics such as L. L. and P. I., shrinkage etc., with different amount of stabilizer.
- (6) Effect of initial moisture content and degree of compaction.

Future Work

It is proposed to take up the following problems in connection with road

engineering as soon as facilities are available.

(1) Tests of painted brick ballast surface under traffic of different intensities and volumes; determination of the factors affecting failure; effect of different dressings and of grits of different sizes and quantities.

(2) Adhesion of tar and bitumen to different aggregates used in road work.

(3) Petrological tests of road stones used in the U. P. for road work.

(4) Temperature stresses in cement concrete slabs—bonded and insulated.

(5) Non-destructive testing of concrete by sonic method and determination of thickness of concrete road slabs and dynamic modulus of concrete road slabs by measuring ultrasonic pulse velocities.

TIME WELL SPENT

The senior partner was annoyed. "You are wasting too much of your time on your general appearance."

"It's not wasted. I've only been here two months and I'm already engaged to the handsome young manager," said the typist.

GARDENING TIPS

For a successful garden—don't plant more ground than your wife can manage.

HERE AND THERE

1. THE MOTORIST'S TEN COMMANDMENTS

IF Moses were alive today to survey the nation's yearly traffic casualty list, he might add a second set of Commandments for the guidance of motorists and pedestrians alike. They could read something like this:

1. Thou shalt not speed.
2. Thou shalt respect the rights and privileges of others to use our streets and highways.
3. Thou shalt obey the traffic codes.
4. Thou shalt honour the speed laws of thy city and state even when no officers of the law are in sight.
5. Thou shalt not covet the speed of thy neighbour's car when doing so involves the slightest risk or hazard.
6. Thou shalt not set a defiance the "Stop and Go" signals, nor the

arterial "Stop" signs on the premise that they are merely ornamental.

7. Thou shalt exercise maximum caution at all times and under all circumstances in the operation of any motor vehicle.
8. Thou shalt walk at all times in the cross-walks of streets and highways, having due regard for the oncoming traffic.
9. Thou shalt not drink any intoxicating beverages before driving, for an intemperate man is neither a judicious nor a level-headed man.
10. Thou shalt drive always as thou wouldst have others drive on the same street or highway where thou art driving.

(Extracted from "The Highway Magazine"—Sept. 1950).

2. FALLACY OF THE SUBDIVISION OF LABOUR

THE subdivision of labour is harmful because it turns man into a tool: it creates monotony which can only be remedied by shorter hours of work; it produces the notion that leisure time is more to be desired than working time, for it deprives the worker of the right to express himself in his work; it puts quantity before quality: it robs the worker of the responsibility for his work: and it destroys the good relationship between master and workmen.

* * *

Getting the best out of men is an art. But, it is not an art that can be practised whilst timing human activity with a stop watch, for success means getting the willingness of the worker by the free giving. You may tap this willingness if

you demonstrate an intimate knowledge of work and workers by setting a fair day's work which the worker knows to be achievable because it is based on your ability to perform. Either that or you exercise a natural gift in the art of management sufficient to arrange conditions of work so that men reciprocate and give a fair day's work without prompting. But try as you may it is impossible to succeed by methods of bellhorse leadership or by theoretical calculation based on time-motion study.

[From an article: "Time-Motion Study as a Measure of Management" from "The Surveyor"—August 4, 1950.]

3. A NEW ROAD MENACE

White Ants Eat Roads

WHEN a vehicle broke through the surface of a road near Darwin (Australia) it was found that two long strips of it had been eaten away by white ants.

The road had recently been repaired and

re-sealed with bitumen. This is the first time here that the ants have been known to turn their attention to bitumen.

(Extracted from "Hindustan Times"—4th December, 1950.)

4. THE PRICE OF IGNORANCE

AFTER discovering quicksand in test borings, the Ferguson and Edmondson Co., Pittsburgh, informed T. J. Kayer, Ohio Highway Director, that it would forfeit a **10,000 dollar** bond and not build a bridge over the Chagrin River in Lake County. The firm was low bidder July 27 at 519,951 dollars. The project also includes a mile of road relocation.

The bid was 123,049 dollars below the engineer's estimate and 105,217 dollars below the next lowest bid, which was submitted by the Horvitz Co. of Cleveland. The project will be re-advertised for bids.

L. F. Schaeublin, Chief Engineer and assistant director of the Ohio Highway

Department, said the company's borings showed the water silt to be in the same place as shown on the soil profile made by the department, which had been available to bidders. Schaeublin said the company's representative indicated **the company had not known the soil profile was available.**

Refusal of a bidder to accept a contract once it has been awarded is almost unprecedented as far as the Ohio Highway Department is concerned.

(Extracted from "Engineering News-Record" Sept. 7, 1950.)

5. COEFFICIENTS OF FRICTION

FROM data collected from tests on automobile tyres and limited to speeds of about 40 m. p. h. the report* concludes that sliding friction is significantly affected by road surface texture, but that information can be given only in the form of limits such as:

Concrete surface — 0.55 to 0.70, any speed, wet or dry

Smooth Asphalt (dry) — 0.60 to 0.75, constant with speed

Smooth Asphalt (wet) — 0.20 to 0.40, at 30 m. p. h.

Plotted curves illustrate the fact that surface texture is more important than

the actual material of which the road or runway is composed.

The effect of speed is less noticeable on dry surfaces than on wet surfaces.

All sources of information referred to in this report agree that tests at slow speed (5 m. p. h.) give no indication of friction values at high speeds.

The effects of tyre tread are noticeable only on wet surfaces, because of the squeegee action.

The coefficient for ice on pavement is 0.15 to 0.20 and is independent of speed.

(Extracted from "Highway Research Abstracts," May 1950.)

* By E. C. Pike, Journal of the Aeronautical Society, Dec. 1949.

6. HIGHLIGHTS OF NEW JERSEY'S 1949 TRAFFIC ACCIDENT EXPERIENCE

A person was killed every 14 hours and 48 minutes.	One in every ten accident drivers was a female.
One person was injured every 19 minutes.	Every eighth driver involved was a non-resident of New Jersey.
The ratio of injured to killed was 46 to 1.	An alcoholic driver figured in every twenty-seventh accident.
4.00 to 5.00 p.m. was the most dangerous hour of the day.	Every fifth adult pedestrian killed in accidents was under the influence of alcohol.
There were 173 accidents daily, on the average.	259 pedestrians were killed and 4,889 were injured.
December recorded the highest number of accidents and fatalities.	Three in every four pedestrians killed contributed to their fate through careless crossing or walking.
There were more accidents on Friday than on any other day of the week.	A tyre blow-out was the cause of one in every 213 accidents.
The mileage death rate (deaths per hundred million vehicle miles of travel) was 3.85—half the national rate.	There were 1,958 hit and run drivers.
The economic loss was 38,480,000 dollars or 9.24 dollars per capita.	Collisions between bicycles and motor vehicles caused 13 deaths and 570 injuries.
One-third of the accidents were " same direction " accidents.	Three in every five vehicles in accidents were insured.
85 per cent of the vehicles in accidents were passenger cars; 11.5 per cent were commercial vehicles.	One in every three cars presented on initial inspection was rejected for failure to meet legal safety requirements.
62 per cent of all accidents happened in daylight and 78 per cent in clear weather.	
64 per cent of fatal accidents occurred at night and 80 per cent in clear weather.	

(Extracted from 'Highway Research Abstracts'—May, 1950).

(Continued from page 10)

The system is also being used in Sweden, Turkey and Egypt.

Though the initial cost of the Holter machinery exceed that of other types of road-making machinery, this is, however, more than outweighed by the saving made on the mixing plant which may be cut to

half the capacity needed for other methods. Besides, the shorter transport of aggregate makes for additional economies. The machinery is too elaborate to be a practical proposition for small contractors, but for regular roadbuilding contractors engaged in large-scale building, the Holter system should offer many advantages.

ORISSA P.W.D. BUDGET FOR 1950—51

The following extracts have been taken from the Government of Orissa P.W.D. Budget for the year 1950-51 in respect of revenue from and expenditure on Civil Works.

Revenue (Civil Works) (All Figures are in Lakhs of Rupees)

	Actuals 1948-49	Revised Estimate 1949-50	Budget Estimate 1950-51
1. Rents ...	1.38	2.43	2.65
2. Ferry Receipts and Tolls on roads ...	.09	.20	.18
3. Recoveries of expenditure ...	6.92	.12	.10
4. Transfers from Central Road Development Account			
(i) Ordinary ...	—	.47	1.00
(ii) Reserve ...	—	—	2.00
5. Transfers from fund for Orissa Buildings ...	.12	63.00	43.71
6. Miscellaneous ...	1.06	2.90	2.84
7. Khondmals Road Fund ...	.03	.05	.05
8. Deduct-Refunds ...	-.18	-.02	-.02
	9.42	69.15	52.51

Expenditure (Civil Works)

	Actuals 1948-49	Revised Estimate 1949-50	Budget Estimate 1950-51
1. Original Works ...	41.04	61.00	76.49
2. Original Works-Postwar Development ...	22.65	37.34	21.58
3. Repairs ...	22.43	37.56	20.37
4. Grants-in-Aid ...	5.11	8.78	5.08
5. Grants-in-Aid. (Postwar Development) ...	1.81	3.48	.05
6. Suspense ...	2.07	3.00	3.00
7. Lump Deduction for Probable savings ...	—	—	6.72
8. Expenditure on Electrical Works ...	—	5.04	3.92
9. Expenditure in connection with the Capital construction in Orissa ...	-.28	121.19	60.23
10. Establishment & Tools and Plant ...	17.40	21.79	20.70
	112.23	299.18	204.70

Expenditure on Communications only is as below :

(All Figures are in Lakh of Rupees)

	Actuals 1948-49	Revised Estimate 1949-50	Budget Estimate 1950-51
1. Original Works ...	5.90	8.68	19.10
2. Original Works—Postwar Development ...	n. a.	19.67	13.87
3. Repairs ...	n. a.	25.00	12.80
		53.35	45.77

("n. a." = "not available.")

A Brief Review of the Orissa Budget
(with special reference to Civil Works)

The total revenue receipts of Orissa for 1950-51 are estimated at Rs. 10,65.81 lakhs and revenue expenditure at Rs. 11,41.76 lakhs with a consequent deficit (on revenue heads) of Rs. 75.95 lakhs. The revised estimates for 1949-50 indicate a deficit of Rs. 144.35 lakhs with the revenue receipts amounting to Rs. 10,98.04 lakhs and revenue expenditure to Rs. 12,42.39 lakhs. The Budget estimates of revenue and expenditure for 1950-51 are lower than the revised estimates for 1949-50.

Revenue expenditure on Civil Works for 1950-51 estimated at Rs. 204.70 lakhs

form about 18 per cent of total provincial revenue expenditure in the same year. The corresponding percentage for 1949-50 was a little higher i.e., 24 per cent.

Expenditure on communications (original works and repairs) in 1950-51 is estimated to be Rs. 45.77 lakhs, the corresponding figure for 1949-50 being Rs. 53.35 lakhs. In both the years the expenditure on communications forms about 4 per cent of total revenue expenditure or about 39 per cent of expenditure on Civil Works excluding electrical Works under original works and repairs.

MODEL ANALYSIS OF STRUCTURES**A Comparison with Calculated Values**

(Extracted from 'Civil Engineering'—June 1950).

THE method of structural analysis employing elastic models constructed of celluloid or similar material is generally taught in classes of university degree standard and there is increasing evidence that the method is finding many applications in practice. A QUESTION which is often raised in connection with such model tests concerns the numerical agreement which may be expected between the results of a normal calculation method and that given by the experimental method. The results obtained by elastic models, with degree students in their final year, a total number of 62, may therefore be of some interest as indicating the range of agreement given by the method in the hands of operators of the types usually employed in design

having the leading dimensions shown in Fig. 1. The model was cut from a sheet of transparent celluloid with a uniform thickness of 3 mm. to a linear scale of $\frac{1}{2}$ inch to 1 foot and so proportioned in depth that the cube of the depth of the model was proportional to the second moment of area of the bridge cross section (per foot width) at the same position. The only properties required from the material used for the model are that it must have a straight-line elastic law and be easy to cut to the desired shape.

Celluloid, xylonite and even a good quality cardboard may be used for the purpose. The time taken for the test is short and any creep of the material is not

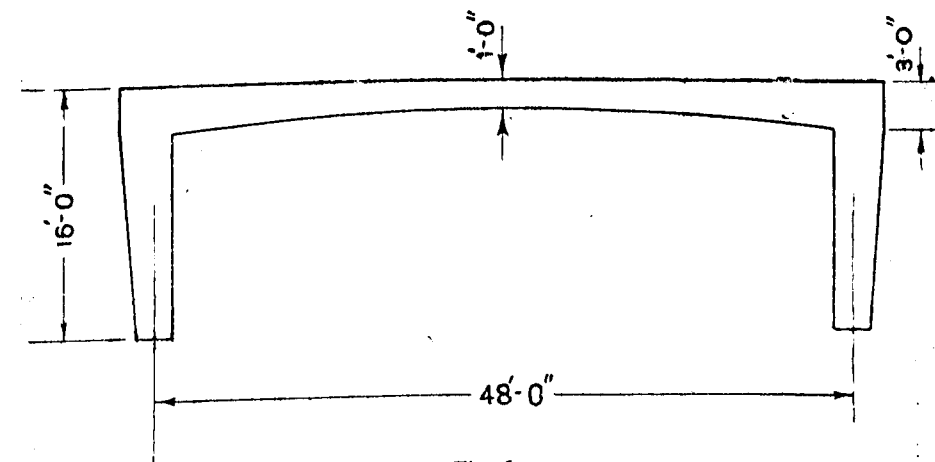


Fig. 1.

of importance within reasonable limits. Materials of this type may be distorted through comparatively large distances to obtain the elastic line and all measurements may then be made with a steel rule to an estimated 0.01 in. accuracy. The elastic movement horizontally at one pin for the model used in the experiments could be as much as 0.5 in. without overstraining the material. Travelling microscope microscopes are not required in this form of model analysis and the results are regarded as free from any considerable temperature effects.

The example chosen for the purpose was a two hinged portal frame bridge

In use, the model was first pinned to the drawing paper, with the pins at the hinge positions and on a horizontal line, the model then being in the free or unstrained position. An outline of the model was then made using a hard chisel-pointed pencil. One pin was then moved to a suitable distance along the horizontal line and a new outline of the model made in its new deformed position. The model may then be removed and a series of measurements made from the outlines on the paper to obtain the value of Vertical movement

Horizontal movement. A graph drawn between this value and the original horizontal position on the model to which it applies gives the Influence Line for Horizontal Thrust.

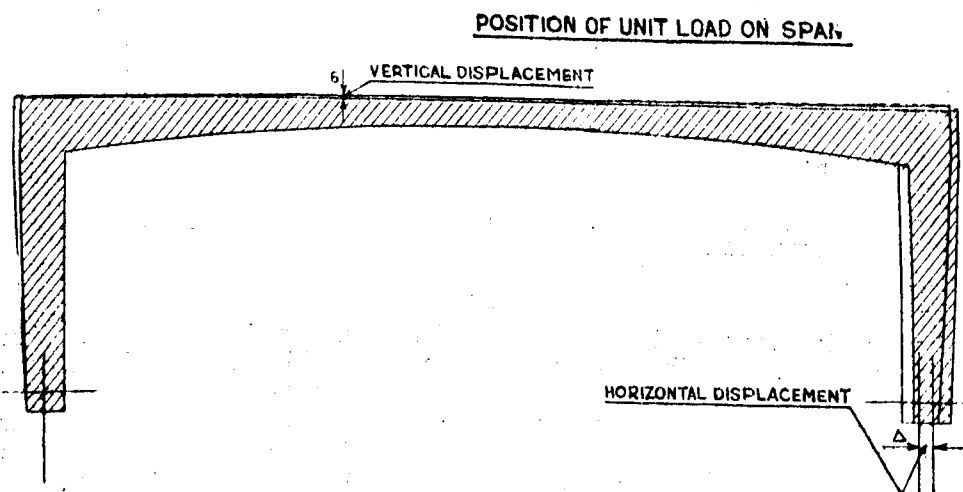
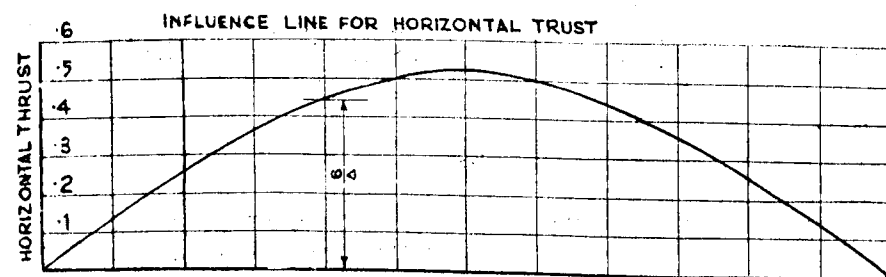


Fig. 2

The model is shown in the deformed position in Fig. 2 together with a typical influence line obtained by its use. The model outlines have, of course, been increased in thickness for reproduction purposes. It will be clear that the one

horizontal movement supplies a knowledge of all the vertical movements and that repeated use of the model is not necessary.

The theory underlying the model analysis of structures is dealt with in most modern textbooks and the following brief summary will be sufficient for the present purpose:—

Notation:

Y_{bc} reads "the displacement at B due to unit load at C." First suffix is the point which moves and the second suffix is the position of the load. The displacements are measured along given axes.

Referring to Fig. 3 representing a portal frame, let one hinge be regarded as being on a frictionless roller to which a horizontal load of unity is applied. Then in the above notation, horizontal movement of $B=Y_{bb}$ and vertical movement of a

point $C=Y_{cb}$. If the unit load is applied vertically at C, instead of horizontally at B, the horizontal movement of the roller at $B=Y_{bc}$.

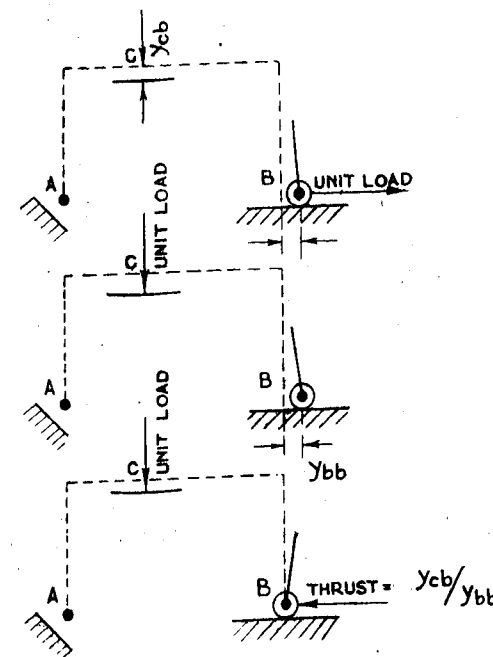


Fig. 3

Since the movements of the frame are elastic, then in order to restore B to its original position, we must apply a horizontal force given by Y_{bc}/Y_{bb} . Maxwell's theorem of reciprocal displacements for

elastic structures shows that $Y_{bc} = Y_{cb}$, the values of the horizontal force are therefore given by Y_{cb}/Y_{bb} which is a value obtained directly by measurement from the first diagram. The assumption that in an actual structure the hinges are not displaced under load will mean that a horizontal re-active force of Y_{cb}/Y_{bb} must act at the hinges.

A simple elastic model provides the most convenient method of obtaining the elastic distortion diagram needed for the displacement measurements. Provided that the model has a straight-line elastic law the magnitude of the applied load does not affect the results since we are only interested in the ratio between the displacements. Doubling the load merely doubles both movements and the ratio remains unchanged. A graph drawn between Y_{cb}/Y_{bb} shows how the horizontal thrust varies as the load moves over the span and provides the influence line for horizontal thrust, which in conjunction with other diagrams representing the simply supported beam effects, may be used to construct the bending moment, normal thrust and radial shear influence lines. The experimental curve was obtained by each student in the manner described and a histogram showing the experimental values for the horizontal thrust when unit load is applied at the crown (the maximum value) is shown in Fig. 4.

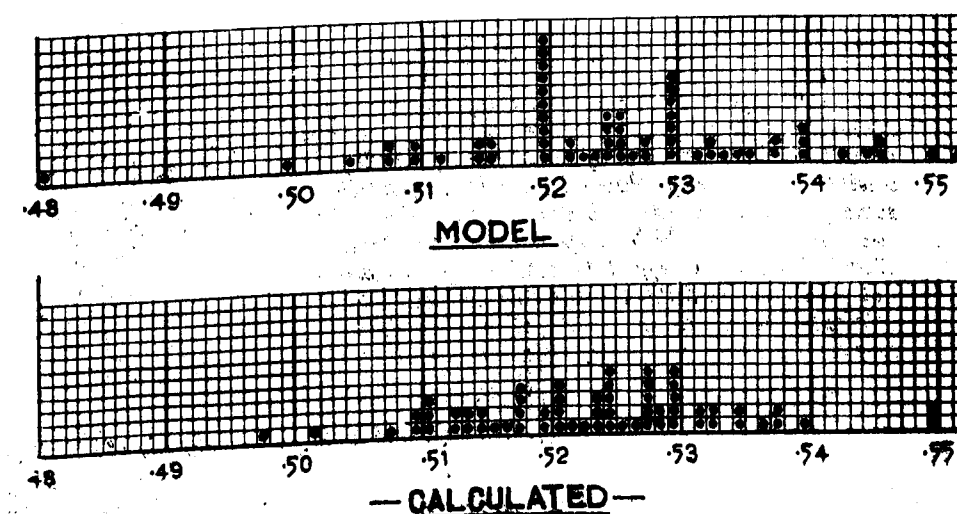


Fig. 4

The calculated values for the horizontal thrust were also obtained, in the usual manner for structures of this type, by the well-known summation method using

$$H = \frac{\sum \frac{My}{I} ds}{\sum \frac{y^2}{I} ds}$$

and extending the calculations over the whole frame. The values obtained by calculation are shown separately in Fig. 4. Normal arithmetical and slide rule methods were employed to obtain these numerical results.

In most cases the experimental values were collected well in advance of the calculated values to avoid any tendency that a knowledge of the calculated value might have in "weighing" the measurements. Comparing the results obtained it will be seen that the variation is rather greater for the model results than for the calculated values. The extreme values of the latter might be

avoided in a design office with greater experience and improved routine checking of the calculations. The present calculations required a certain amount of measurement from drawings, determination of "I" and measurement of the vertical ordinates to the arch axis, etc., and these factors account in part for the differences in results shown by the histogram in Fig. 4. The average results are:

Model analysis	0.526
Calculation methods	0.525

It is clear, therefore, that model analysis of structures can provide an extremely useful check for numerical calculation with very little cost in time and materials and the work requires no specialized experience to give reasonably satisfactory results.

The results upon which this article is based were obtained in the Civil and Mechanical Engineering Department of the Northampton Polytechnic, London, E. C. 1.

THE BEWILDERED MOTORIST

Jostled from lamp-post to telegraph-pole, from high kerbstone to excessive camber, squeezed between a bus and oncoming traffic on entering a bottle-neck, thrown out of his course by a badly sited pedestrian island, bewildered in many places by the lack of intelligent signposting and in some places by an entire absence of any signs, harassed by a series of one-way streets which appear to have been devised by Alice in Wonderland in an effort to bolster up an inadequate road system, it is not surprising that the average British motorist has never become a very efficient driver. He has not got used to driving in his own traffic lane because for never more than a few miles is the traffic lane clearly defined.

(*'Highways and Bridges'*—July 26, 1950).

(o)

"STRIPPING" OF AGGREGATE IN BITUMINOUS WORK

Use of Magnesium Stearate.

(*"Extracted from Main Roads"*,—September 50)

THE past few wet seasons have brought into prominence in New South Wales the danger of water displacing bitumen films from aggregate particles in bituminous road pavements. This is generally known as "stripping" of aggregate. Several failures of pavements have resulted in New South Wales from this action.

The Department has been conducting in its laboratory a series of experiments designed to determine the extent of the danger of "stripping" failures and investigate possible remedies. The most common type of remedy has been the incorporation in the bitumen of some "additive" included to increase the adhesion of the bitumen. These experiments have shown:—

1. That an unexpectedly high proportion of New South Wales aggregates are liable to stripping.
2. That, contrary to the widely held belief, many "basic" rocks (basalts, dolerites, etc.), are liable to stripping and some "acid" rocks (quartzite, etc.), are not.
3. That certain commercial additives which are available in New South Wales prevent stripping with many aggregates, but are ineffective with other dangerous aggregates. (They are in general effective with "acid" aggregates only).
4. That sodium and calcium salts of phenolic acids, also suggested as

possible additives, are inferior to the commercial additives.

5. That magnesium stearate added to the bitumen (approximately 1½ per cent) is the most promising additive yet tested. For quite a wide range of aggregates, both acid and basic, it produces a substantial improvement in the adhesion of bitumen in the presence of water. This improvement seems to be sufficient to prevent dangerous stripping with all aggregates tested.

Magnesium stearate was suggested by the Department's chemists. Subsequent to the suggestion and to the work that followed and led to conclusion no. 5 above, British publications have been received showing that road research authorities in Britain have found similar promising results with other heavy metal soaps. Magnesium stearate is, however, preferred as in New South Wales it is the most readily commercially available material of this type.

Actual field works conducted with the recommended addition of magnesium stearate to the binder have demonstrated that the process is simple, free from difficulty, and reasonably economical. The actual cost of the material amounts to about 2d. per gallon of binder. Laboratory work is being extended to verify that the new "additive" is effective with all aggregates, or to ascertain what type or types of aggregate fail to respond.

JL

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CORRESPONDENCE

Calcutta, November 10th, 1950.

To
The Editor,
"Transport-Communications
Monthly Review,"
New Delhi.

Dear Sir,

By what right does the Transport-Communications Monthly Review assume, (February 1950, page 34, under heading "Conscription"), that a student of Cambridge University should have had no experience of modern Conscription?

It is in fact very common for students to serve their period of conscription in H.

M. Forces after leaving school but before going to a University, and there are still a great many students of more mature years who have not only experienced conscription, but who in addition, served their country during the last War.

Yours faithfully

(The Editor accepts the correction and notes that the student who prayed that conscripted youth should be used efficiently and the days of their hope not squandered was probably speaking from better experience of the inefficiency and lack of imagination of those in authority.—Ed.)

WARNING

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List of Approved Road Development Schemes.

S. No.	Job No.	Name of work	Amount approved Rs.	REMARKS.
MADRAS				
1.	411 MD 43	Construction of a bridge over the Nellivada Tank in mile 7/7 of Vizianagaram-Central Provinces Roads in Visakhapatnam District.	38,000/-	
BOMBAY				
2.	415 BM 9	Reconstructing and bringing up to standard miles 40-55 of Poona-Sholapur Section of National Highway No. 9.	1,26,600/-	
WEST BENGAL				
3.	416 BG 35	Reconstruction of a masonry culvert in the 2nd furlong of the 25th mile of Calcutta-Jessore Road, N.H. No. 35.	22,500/-	
UTTAR PRADESH				
4.	412 UP 28	Widening and improving the pontoon bridge at Birdghat over the Rapti river near Gorakhpur (N.H. No. 28).	70,577/-	
ASSAM				
5.	417 AS 37	Surfacing of Assam Trunk Road in the Jorhat Division (Miles 194-209).	4,15,400/-	
6.	413 AS 37	Surfacing of Assam Trunk Road, miles 209-223 (Jhanzi to Sibsa-gar in Lakhimpur Division).	3,88,400/-	
AJMER				
7.	414 AJM 8	Improvement and widening of Ajmer-Jaipur Road (N.H. No. 8) from 9' to 12' in miles 6 to 16.	88,230/-	
ORISSA				
8.	405 RS 5	Construction of N.H. No. 5 from Railway line to Khandgiri, miles 0-2.	2,22,000/-	

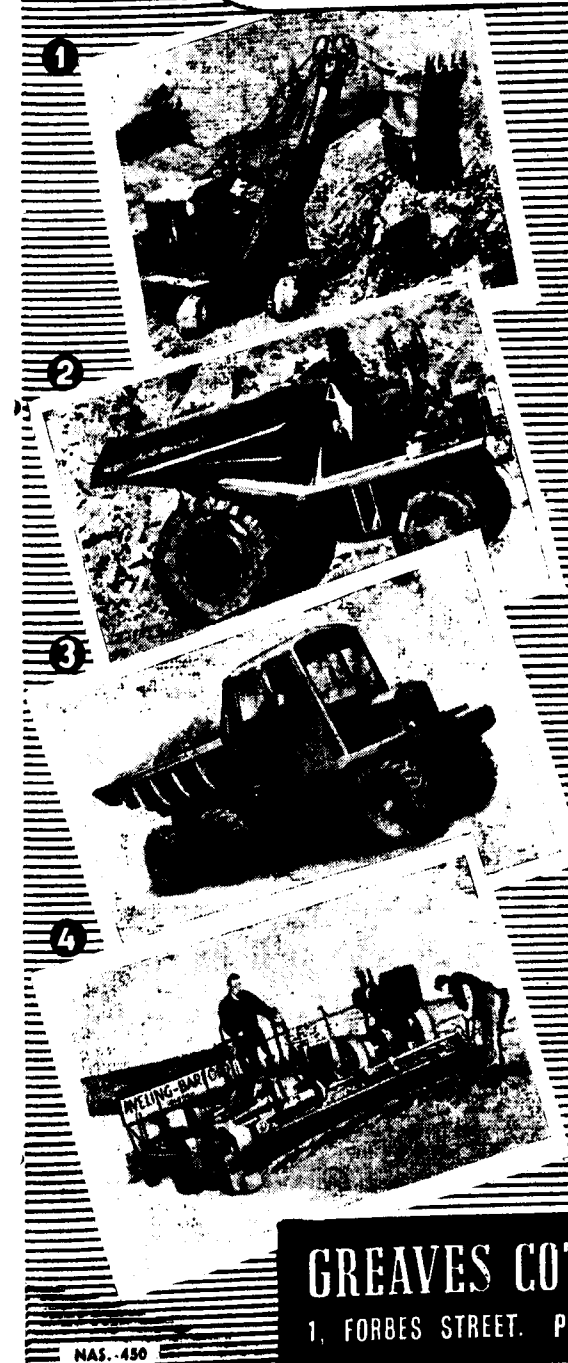
S. No.	Job No.	Name of work	Amount approved Rs.	REMARKS.
<i>Continued</i>				
9.	406 RS 5	Construction of N.H. No. 5 from Railway line to Khandgiri miles 2 to 4.	1,05,000/-	
10.	407 RS 5	Construction of N.H. No. 5 from Railway line to Khandgiri miles 4 to 6+2642 ft.	2,13,000/-	
11.	408 RS 5	Construction of N.H. No. 5 from Khandgiri to mile 25 of Cuttack-Ganjam Road, miles 6+2642 ft. to 10.	1,97,000/-	
12.	409 RS 5	Construction of N.H. No. 5 from Khandgiri to mile 25 of Cuttack-Ganjam Road, miles 10 to 15+2400 ft.	3,47,000/-	
13.	410 RS 5	Construction of two diversions from mile 655/0 to 655/6 and 656/3 to 657/1 in Madras-Calcutta Trunk Road (N.H. No. 5.)	42,900/-	
14.	413 RS 5	Acquisition of land from the junction of Jagatsinghpur Road and the approach road to Taldanga Canal bridge to the level crossing near Cuttack Station for construction of National Highway No. 5.	51,000/-	
15.	419 RS 6	Construction of approach road to Kota Bridge on N.H. No. 6.	1,43,000/-	
16.	420 RS 6	Additional survey of National Highway No. 6 passing through Eastern States.	28,400/-	

List of Books added to the Roads Organization Library during November, 1950.

- National Petroleum News**, Vol. 41, No. 14, dated 6-4-1949. Hubbard and Frederick C. Field. (The Asphalt Institute 801, Second Avenue, New York, N. Y. (U.S.A.))
- Asphalt in Modern Building Construction** by G. J. Hancock. (George Newnes Ltd., Tower House, Southampton Street, Strand, London, W.C. 2, 1950.)
- The Mathematical Solution of Engineering Problems** by Marie G. Salvandori and Kenneth S. Miller. (McGraw Hill Book Co., Inc., New York, 1948.)
- Brick and Modern Research** by Butterworth (Crosby Lockwood and Son Ltd., London, 1948.)
- Population Census Methods**—Population Studies No. 4 (Deptt. of Economic Affairs, Statistical Office of the United Nations, Lake Success, New York, 1949.)
- Census, 1951**—Tabulation Plan by Registrar General of India. (Manager of Publications, Delhi.)
- Prevention of Road Accidents**—Digest of the reports presented for the conference in Geneva, September 1949. Presented by Sir Howard Roberts. (International Union of Authorities, the Hague, Paleisstraat, 1949.)
- The Scientific Paper**—How to prepare it, How to write it by Sam F. Trelease. (The William and Wilkins Company, Baltimore, 1947.)
- The Compaction of Soil**—A study of the performance of Plant—Road Research Technical Paper No. 17. (His Majesty's Stationery Office, London, 1950.)
- A Direct Method of Determining Thickness of Asphalt Pavements** with reference to Subgrade support—Research series No. 7, by Prevost
- Policy on Maintenance of Shoulders, Road Approaches and Side-walks**. (The American Association of State Highway Officials, 1220, National Press Building, Washington 4, D.C.)
- Effect of Sand Grading on the Properties** Concrete-Technical Memorandum No. 6-307, (Waterways Experiment Station, Vicksburg, Mississippi.)
- The Relation of Thermal Expansion of Aggregate to the Durability of Concrete**—Bulletin No. 34. (Waterways Experiment Station, Vicksburg, Mississippi.)
- Evaluation of Present State of Knowledge of Factors Affecting Tidal Hydraulics and Related Phenomena**—Report No. 1 of the Committee on Tidal Hydraulics. (Waterways Experiment Station, Vicksburg, Mississippi.)
- T.M. No. 3-271, Soil Compaction Investigation Report No. 1**, Compaction Studies of Clayey Sands. (Waterways Experiment Station, Vicksburg, Mississippi, 1949.)
- Highways in Our National Life**—A Symposium by Joan and Wheaton J. Lane. (Princeton University Press, Princeton, New Jersey, 1950.)
- Rubber Developments**—Vol. 3, No. 3 Sept. 1950. (The British Rubber Development Board Market Buildings, Mark Lane, London, E.C. 3.)
- Rubber Bituminous Road Construction** by Ir. F. T. Bokma. (The British Rubber Development Board Market Buildings, Mark Lane, London, E. C. 3.)

19. **Demonstrations of Road Surfacing of Rubber Powder/Asphalt Mixtures.** (The British Rubber Development Board Market Buildings, Mark Lane, London, E.C.3.)
20. **Rubber Developments**-Vol. 3 No. 2 June 1950. (The British Rubber Development Board Market Buildings, Mark Lane, London, E.C.3.)
21. **Stretching Highway Dollars with Rubber Roads** by Harry K. Fisher. (Natural Rubber Bureau, 1631, K Street, N.W., Washington 6, D.C.).
22. **B.S. 505; 1939—Road Traffic Control**—(Electric Light Signals) (British Standards Institution, London.)
23. **Tata SCOB — Abridged List of Products.** (The Tata Iron and Steel Co., Ltd., 23-B, Netaji Subhas Road and the Steel Corporation of Bengal Ltd., 12, Mission Road, Calcutta 1. 1949.)
24. **A Design for the Layout of Indian Transport and Communication System,** by Govind Balakrishna Deodikar. (The Indian Society of Agricultural Economics, Bombay 1949.)
25. **Roorkee Treatise on Civil Engineering**—Section VII Bridges, 9th Edition incorporated with a chapter on Steel Bridges by C.E.V. Goument & L.H. Swain. (The Book Depot, Govt. Photo Litho Press, Roorkee.)
26. **Traffic Surveys under Indian Conditions** by C.S. Anantapadmanabhan. (The Manager of Publications; Delhi.)
27. **World Road Statistics.** (The International Road Federation Ltd., 18 South St., London, W.1.)

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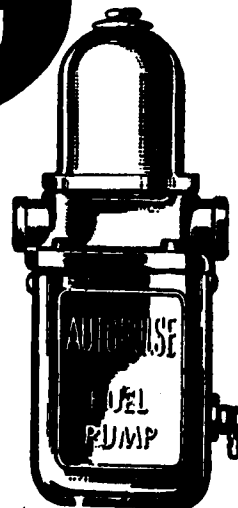
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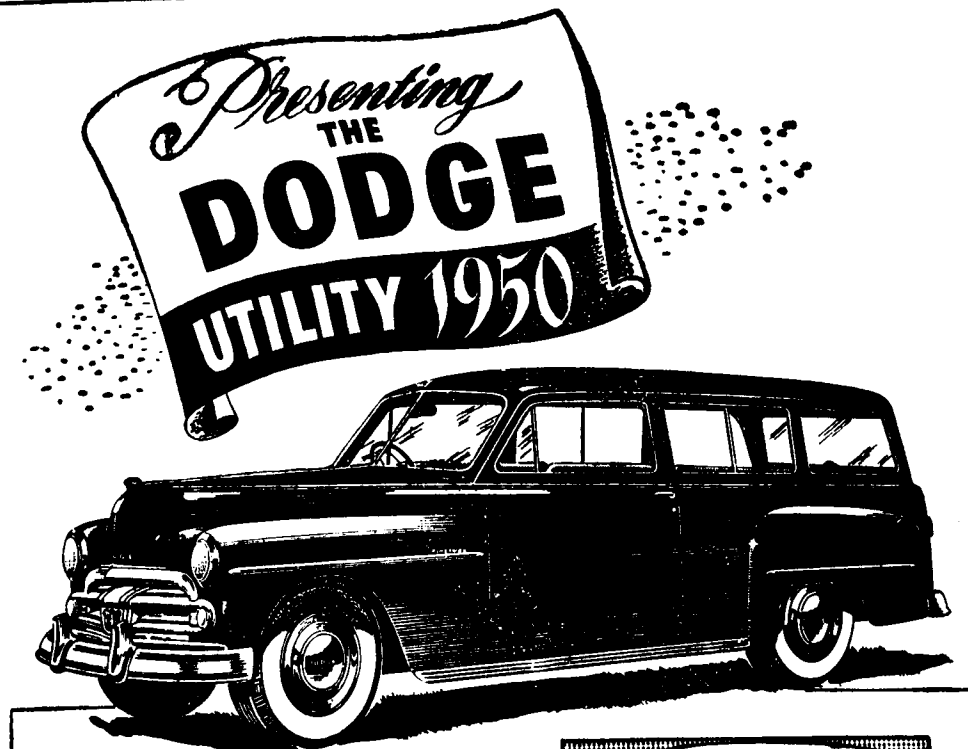
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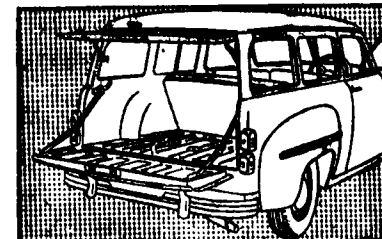
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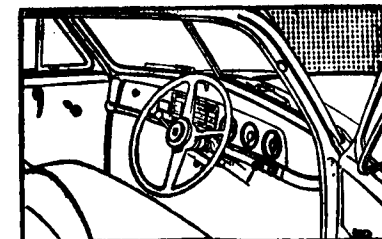
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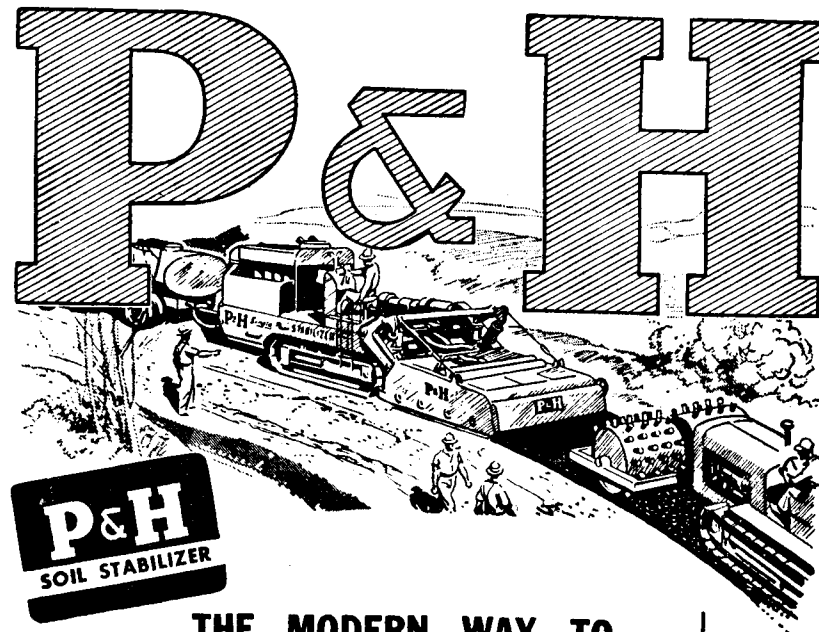
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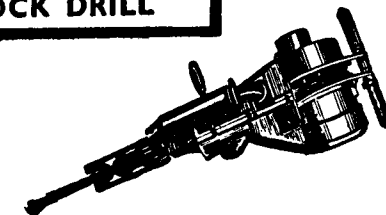
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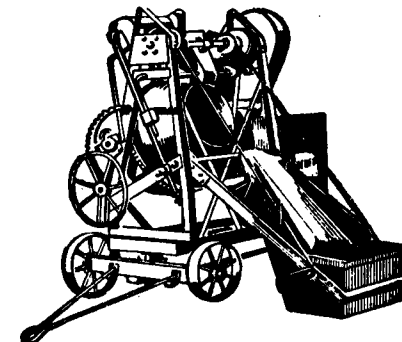
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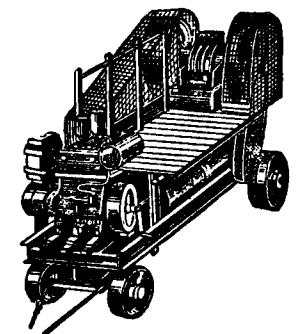
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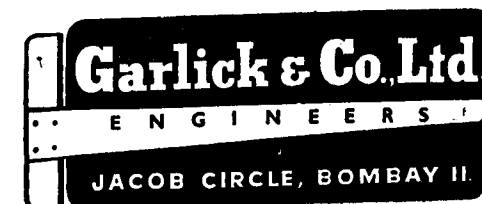
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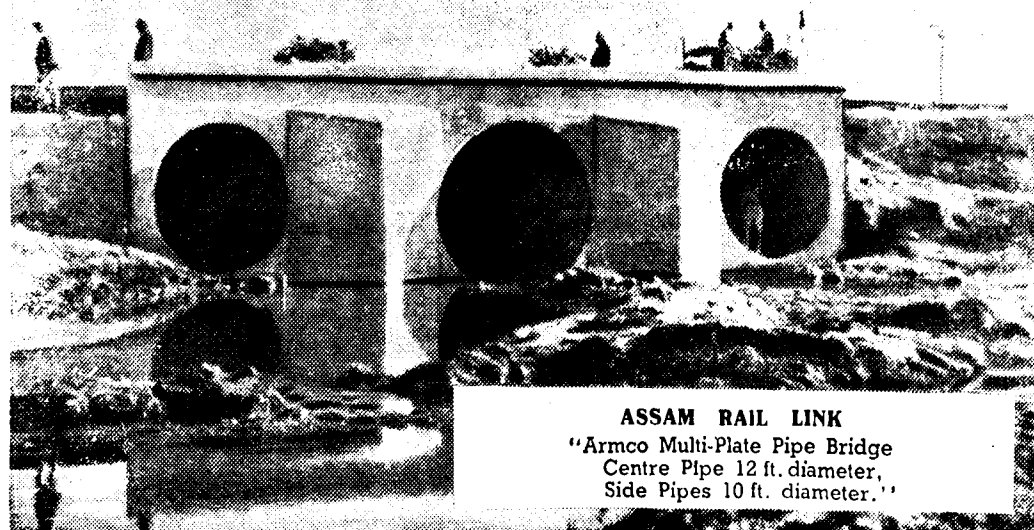
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