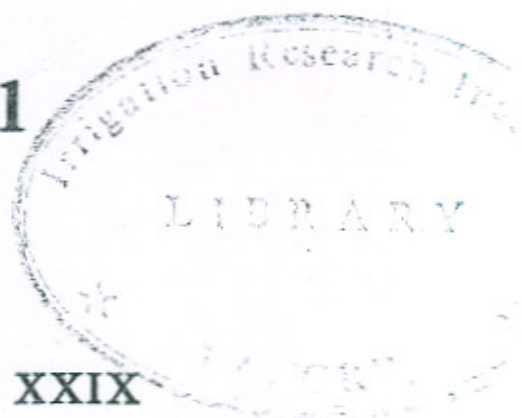


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The Punjab Engineering Congress

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(1941-42)

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PRESIDENTIAL ADDRESS

THE PUNJAB ENGINEERING CONGRESS SESSION, 1941

BY MR. R. TREVOR JONES, M.C.

Hon'ble Malik Sahib and Gentlemen,

My first and most pleasant duty is to welcome you, Hon'ble Malik Sahib, in the name of the Punjab Engineering Congress at their opening session. I know I am voicing the feelings of my brother members in stating that we feel it most fitting and satisfying to have the honour of the presence of the Hon'ble Minister of Public Works on such an occasion. For nearly four years you have controlled the Public Works (Civil, Mechanical and Electrical) of the Punjab as a most capable Administrator with a keen perception of the needs of the Province and a quick grasp of the engineering problems involved.

I am fortunately in a position to be able to testify to this personally and would willingly enlarge even further on your special aptitude for the high office you hold but whilst a good report and one that is genuine on a superior by his subordinate is really the most satisfactory praise the former can obtain, it is somewhat unusual and unorthodox.

I consider it one of the greatest honours that has befallen me to have been elected President of this Congress but at this present stage in history it is a somewhat heavy responsibility and to fulfil this rôle with any aptitude and resource will tax my ability.

In these days of world war, never has the demand on the engineer been greater and when victory and peace have been attained an even greater task will present itself and greater energy will be necessary to restore equilibrium and human happiness.

I need not and cannot speak of the vast and efficient war work which is being done by engineers from the Punjab and by many of our members : with much of it you, who are present to-day, are vitally concerned. I can, with perfect confidence, assure you that our members are doing their utmost to prosecute this struggle for liberty and freedom either in addition to their normal occupation or wholly on military or civil defence.

Many of the members of this Congress, both old and young, have proceeded overseas and I am equally confident that they will maintain to the full the reputation of the Punjabi soldier for courage and gallantry.

But may I be permitted to suggest that, in the midst of our present activities, we turn our minds and spare time to the difficult problems which will present themselves for solution after the war.

I may be accused of trying to preach a sermon, but many of us, who experienced the aftermath of the last war, may welcome advice and counsel, however obscure and superficial to our younger brothers. Sir John Anderson, in a recent speech to the Institution of Civil Engineers, said, "We had some experiences in the last war of the difficult and painful processes of reconstruction and readjustment which had to be gone through in succeeding years. There is no reason to suppose that these processes will be less difficult or less painful after this war"

"One thing is certain: we shall emerge when this war is over into a world greatly impoverished in material things and in the processes of rebuilding the engineers will have a great part to play."

"They may have to change some of their standards, and to alter some of their conceptions of what, from the point of view of the engineer, would be the ideal method of procedure, but I am certain that if engineers will, during the period of war and in spite of their pre-occupations, spare time and thought to the later problems of reconstruction, they will be able to do a great deal to make up for the years which the locusts will have eaten."

At the outset it is perhaps necessary to outline the various directions and problems in which the experience, imagination and initiative of the individual engineer could, with advantage, be enlisted. But it is a colossal field and I cannot venture to do more than suggest a few, many of them probably already too well-known and too obvious to be touched on.

If we accept the principle of the urgency of early preparation for *post bellum* reconstruction, development and economic progress, it is wrong to rely on the genius and foresight of a few individuals. We know what the Irrigation Research Institute has achieved already and what it is likely to do in the field of water-logging prevention and cure, reclamation of land, soil stabilization and so on.

Why should not similar scientific research be undertaken for buildings, roads, electricity, water supply, sewage disposal—in fact for scientific engineering generally? This must come, and the sooner the better, and I feel sure that it would be wholeheartedly welcomed by this Congress and all engineers.

I do not, however, for a moment recommend that the individual engineer with ideas and perspicacity should not be discouraged or distracted from attempts to augment efforts to improve engineering technique. Many papers have been sent to this body during it

existence which have proved of the utmost value in initiating schemes and procedure which are to-day considered almost commonplace routine.

Then there is a vast source of material in this land, either undiscovered or undeveloped, which it is the duty of the engineer and the scientist to investigate and adopt if technically and economically sound to do so. Economy and expenditure, we all know well, play a vital part.

A few years ago, it would have been considered bordering on lunacy to suggest the possibility or practicability of building high-level dams to store the water of our great rivers or to urge the advantages to be derived from lining of all canals and even watercourses. Is this so to-day? I believe not.

The question of cost is a formidable one and it is the engineer's duty to discover the most economical construction, both in capital outlay and maintenance, as well as design, which is stable and efficient.

In spite of the importance of costs, my advice to you all, for what it is worth is: Do not be diverted or distracted from a sound common-sense solution of a problem because it appears prohibitive in cost. It may never materialize in your time but, if it is practically and theoretically feasible, it will be some day an accomplished fact, both economically and technically healthy.

I am very tempted to compile a list of the various lines of advance along which engineering progress should proceed. Yet not only should I greatly tire my audience but I should have to explore fields of engineering which lie beyond the scope of my personal experience. I can, however, claim some knowledge of the work entrusted to the Buildings and Roads Branch, P.W.D., and some experience of its particular requirements of technique and organization. Let us take roads. The Punjab is credited with good roads but have they reached the highest pitch of efficiency? I think not—and I believe many of you will agree with me. What are the problems to be faced in road research? These are grouped in the "Report of the Road Research Board, 1935" as

- (1) Economy in road-making and maintenance,
- (2) Reduction of accident ratio, and
- (3) Solution of urgent practical problems.

It is for our road engineers to find the answer to this definition in so far as it concerns this Province.

Probably one of the most vital needs of the Punjab is water supply and distribution to towns and villages, and the design of cheap and efficient methods is a peculiar and specialised study.

In Lahore at the present moment the sewage scheme is progressing with great speed and success. Although it is mostly hidden from the public view, except the temporary excavation mounds, any engineer will realise at once the magnitude of the operations and the brilliant treatment in design and execution. Likewise he will comprehend that this scheme will inevitably prove to be the forerunner of a host of such installations which the ever-growing towns of the Punjab will insist on in the near future as a common public necessity. Here is a tremendous field of activity for the engineer, both civil and mechanical.

Building design has rapidly developed in recent years in the Punjab. But we have to face the fact that there are forces to contend with which we did not consider in our student days when we learnt the "Theory of Structures"—earthquake and air attack. It is no good hoping that the Punjab will never be affected by either; as regards the former, recent scientific reports on seismic zones in the Punjab make it clear that the adoption of certain building specifications are an urgent measure of public safety in many parts of the Province. Fortunately, we have many engineers experienced in earthquake-proof design and construction in India, chiefly in Quetta and Bihar, and it is gratifying to remember that our present Vice-President (Mr. Lyster) has had considerable experience in this particular direction and recently wrote a very valuable paper on the subject for this Congress. As regards "Air Raid-Proof" precautions we shall have more data and facts to work on when this war terminates.

It has been said that we have not evolved the type of house best suited to climatic conditions in the Punjab, namely one that is comparatively cool in the heat of summer, yet warm in the cold of winter and at the same time providing sufficient light and brightness in day time. This undoubtedly will be produced some day by the combined genius and skill of the architect and the engineer.

Town planning is a comparatively new activity in the Punjab but it is undoubtedly one that should not have been neglected in the past as is testified by the manner in which towns have grown in recent years.

Here again the best results will be obtained by the co-operation and co-ordination of the genius of three professions—the lawyer, the architect and the engineer: but the design, the co-ordination and the execution demands specialised technique and experience.

I shall not touch on engineering education which is in itself a vast field and a most important aspect of our profession—indeed I fear that I shall be rightly accused of having taken on myself the role of lecturer to a "post-graduate" class without due justification as it is.

Neither shall I recount the various major works which are at present in progress in all parts of the Province in the many branches

of engineering ; but I must apologize to those of our members, who have so kindly furnished me with the details thereof, for not having made use of the valuable information supplied.

There is a belief or possibly a bias in the minds of certain sections of the public that the profession of engineering is a somewhat humble or lowly one. This arises from a failure to distinguish between a mechanic and a highly educated professional man. It may appear a somewhat redundant and unnecessary topic to raise at such a moment and during a period of universal upheaval. But as I have said before, it behoves us to look ahead and recently the Institution of Civil Engineers have published a paper which was presented to the British and American Engineering Congress on the "Economic and Social Development of the Engineer." Therein the rise and birth of the civilian engineer is discussed at length. He was unknown 200 years ago as a factor or prime mover in civilisation ; in England he was merely a workman of frequently humble origin with no great education or medium of expression. But these men conceived great works, designed them broadly and carried them out by direct labour. In England the only professions recognised at the commencement of the 19th Century were the Church, the Navy, the Army and the Law. Times change and this cannot be said to obtain to-day. There are many callings which a "gentleman" may enter to-day without losing status and the science and practice of engineering is one of them. It will be even more so in the days to come provided (to quote Sir Clement Hindley, past President of the Institution of Civil Engineers) that "it is axiomatic that status depends fundamentally on the technical and ethical standards maintained." When the present war ends, the value and the urgency of the engineering profession will loom so large in reconstruction that the opportunity will be provided to rise to heights in the social and economic structure of the world which only a proved and noble calling can attain. Let us consider the military engineer in regard to his value and worth as held by his brothers-in-arms. The traditions and achievements of the Royal Engineer place him in the forefront of soldierly esteem and regard and this war increases this appraisal by leaps and bounds. So I feel will the civilian engineer in the broad sense (civil mechanical and electrical) rise in the estimation of the public during this upheaval and even more so in the difficult days of reconstruction to come.

Where does the engineer fail to-day ? A friend of mine, discussing professions, claimed that the term should not be applied to the engineer. He said, "Look at your Dictionary and see the meaning of the word 'Profession.'" I looked and one of them is : "an employment not mechanical and requiring some degree of learning." Although this was meant in fun, maybe it has a message for us. Is the efficient engineer liable to become too mechanical in mentality, too rigid in his outlook, too hide-bound by his educational technique and theoretical standards ? This is possibly a danger and one to be guarded against. He can lose what is known as his commonsense,

his power of judging problems from the accepted facts of things. It may be that the engineer's advice in future will be required in many matters which are not necessarily technical or professional.

I am fortified in making such a statement by an extract from the President of the Institution of Civil Engineers' recent speech on a great civil engineer who attained Cabinet rank last year: "We believe ourselves that the experience which we have, not only in controlling the great forces of nature but in controlling the great human forces with which we have to contend in our work, gives us some experience and enables us to act as administrators. And too often and indeed generally in the past engineers have been relegated to positions where they carry out the orders of lawyers and financiers and politicians." Do not let it be imagined that this is a revolutionary slogan or that the engineer dreams of a possible domination by "Technocrats" of the world to come; but rather as an indication and realisation of the immense tasks and duties which lie before us and for which we must equip ourselves not only as technicians but as sensible and valuable citizens in this Land of the Punjab.

Neither let it be supposed that I claim that the engineer is "without honour in his own country" and I should now like to be permitted to congratulate our members who were recently honoured on His Majesty's Birthday or the New Year in the name of the Congress:

Knighthood

Colonel Sir Fredrick Carson, M.C., General Manager, N. W. R.
(Retd.)

C.I.E.

Mr. F. A. Farquharson, M.C., Chief Engineer, I. B. (Retd.)

Mr. A. Oram, Chief Engineer, N. W. F. P. (Retd.).

Mr. J. A. R. Bromage, S. E., New Delhi (Retd.).

M.B.E.

Mr. P. L. Varma, Executive Engineer, Lahore.

Rai Bahadur

Lala Behari Lal Uppal, Superintending Engineer, I. B.

Lala Kanwar Sain, Executive Engineer, I. B.

I will now request you, Hon'ble Malik Sahib, to declare the Congress open.

**Speech by the Hon'ble Major Nawabzada Malik Khizar Hayat
Khan Tiwana, O.B.E., Minister of Public Works**

MR. PRESIDENT AND GENTLEMEN,

I am very grateful to you, Mr. President, for the warm welcome you have extended to me and for the kind manner in which you have referred to my association with certain branches of engineering in the Punjab in my official capacity. It has indeed been my privilege to be in charge of the Electricity and Buildings and Roads Branches of the Public Works Department during the last four years, and I avail myself of this opportunity to express my gratitude for the ready help and willing co-operation received from those of you on whose services I have had to make many calls. Before fates ordained that I should be a Minister in charge of my present portfolio, my interest in engineering problems was of a general character, namely, their effect on the development of the province and the economic progress of its people. And even to-day it is only as a layman and with a layman's hesitation that I address this large and distinguished gathering of experts whose technical knowledge in their respective spheres is so formidable.

You, Mr. President, have referred in very modest terms to the profession of engineering and have even quoted a friend of yours as doubting, though not seriously, whether it is a profession at all. It is a calling which requires a solid educational foundation, and proficiency in it can be attained only with experience. Not only—if I may be permitted to strike a mundane note—is it well-paid like any other honourable vocation, but those who take to it possess the necessary equipment for increasing the wealth of the country. The history of the Punjab in recent years is in a great part the history of the command secured by engineers over forces of nature; and you may well be proud of your contribution to the progress of the province. Curiously enough, the Irrigation Department is not classified as a beneficent department. But the fact remains that the schemes executed by this department have converted millions of acres of arid waste into fertile productive land. They are an envy of the outsiders and, apart from adding to the provincial exchequer, have brought untold benefit to the people. Of the works in execution I must refer to the Thal Project which, in spite of financial stringency, has been taken in hand in the interest of the areas and the people to be served by it. The south-eastern districts have been looking forward to the Bhakra Dam Project with equal eagerness. Considerable fieldwork has been done and alternative schemes have been investigated. But a further unfortunate delay has occurred, as the Sind Government has again raised the question of the distribution

of the waters of the Indus, which will be enquired into by a Commission of Inquiry. I trust that the result of the inquiry will be in our favour and that it will be possible to embark on the project in the near future with a view to providing some permanent remedy against the calamity of famine which is a recurring source of anxiety in those areas.

It is a pity that canals have not proved an unmixed blessing; for with the efflux of time owing to the seepage of water the sub-soil water-level has risen, several valuable areas have become water-logged, and salts have come to the surface, rendering the land unculturable. "It reminds one painfully of the common prophecy in the Sargodha Bar that the lands will become barren once again and that the canal bungalows will be deserted from the roofs of which cowherds will sing their usual songs." I hope and pray that this prophecy will never come true. For I cannot believe that the ingenuity of the Punjab engineers is unable to find a permanent solution capable of being adopted within the financial resources of the province. The irrigation engineers and research workers have already done much to combat the evil by opening up drainage channels. A Land Reclamation Department has been set up to reclaim land which has gone or may shortly go out of use. The work of this department has passed the experimental stage. A great deal, however, still remains to be done and I hope that it will be possible to devise still more effective measures which will convince the zamindar that the trouble has really been averted. At present he is alarmed by increasing patches of *thur* round him and considers that only palliatives have been tried and that a real solution has yet to be found. In respect of new canals the experiment of lining the channels has already been carried out on the Haveli Project and has also been adopted in the case of the Thal at considerable expense in the hope that not only will water-logging be avoided but that additional quantities of water which would otherwise have been lost by seepage will be available for extended irrigation. In a layman's mind there can be no doubt that the experiment will prove a success; but he must wonder whether it can be adopted on a wholesale scale in all new ventures within the bounds of practical finance. The element of cost cannot be ignored and with the best will in the world the financial obstacle may prove insurmountable. The question of finding cheap alternatives must, therefore, continue to engage your serious attention.

Another problem, on the irrigation side, of importance to the zamindar, is the accumulation of silt, which necessitates constant remodelling of channels. It is for technical experts to discover whether some means cannot be devised to do away with remodelling altogether or at least to reduce it to a minimum. I can, as a layman, only impress upon you the desirability of doing whatever is possible to promote the zamindar's interest and to ensure that he can peacefully rely on an unvarying supply of water for his crops. This question must have already received the consideration which it deserves, but with new researches and rapid advances in the science of engineering,

I am confident you will agree with me that the last word on the subject has not yet been said.

One of the many things that strike a visitor to the Punjab is its network of roads and the condition in which they are maintained. We are proud of our roads, but there is still ample scope for improvement and expansion. I am glad, Mr. President, that you yourself have said that they have not reached the highest pitch of efficiency yet. Although after extensive research and experiments the cost of upkeep has been considerably reduced, I hope our engineers will not rest on their oars and will continue to consider the possibility of bringing down still further our total bill for maintenance which is in the neighbourhood of Rs. 44 lakhs, apart from what is spent by local bodies. Cement roads strike one as requiring comparatively little in the way of maintenance. But there may be the question of initial expenditure and also the question whether the climatic and other factors militate against the success of such roads in the Punjab. These are questions which require the earnest consideration of our technical experts. The policy of taking over all important metalled roads from local bodies is being followed by Government steadily. It will relieve district boards of expenditure which they will be able to divert towards the improvement of their unmetalled roads. Here also we turn our eyes to our engineers who, conscious of the heavy cost of metalling, may be able to suggest how unmetalled roads which provide important links can be kept in a condition fit for the requirements of modern traffic at a minimum cost. It is primarily these communications the improvement of which is desired by the cultivator who is the backbone of the Province.

As road transport develops, it is inevitable that competition with the railway will present difficult problems. From the railway point of view an ideal arrangement would be that they should serve the main lines of communication, roads being constructed with a view to bringing goods traffic across country to railway stations. But quite apart from goods traffic, the natural public demand for passenger traffic by road must lead to the maintenance of trunk roads in many cases roughly parallel to the trunk railway lines. There is, therefore, bound to be a certain measure of overlapping and it is neither possible nor desirable for either system to obtain a complete monopoly at the expense of the other. The problem is mainly one of discovering means to avoid unhealthy and uneconomic competition in the matter of fares and goods rates. Under the new Motor Vehicles Act it is possible to exercise a far stricter control over road traffic than in the past; and steps are now being taken generally to improve the organisation of motor transport by settling vehicles on specified roads, by the issue of time-tables, and by the fixing of fares. Checking posts and weigh-bridges have also been set up at important points in order to counter the overloading of transport vehicles on roads which is one of the worst features of competition in the matter of goods traffic.

Sir Firoz Khan Noon, addressing the Congress in 1936, said that Lahore was looking up to Mr. Howell to give the city a waterborne sewerage system within the next ten years. I am glad to be able to say that considerable progress has already been made with the scheme and that the first instalment will be completed long before that period of ten years has expired. For the thoroughness and expedition with which the work is being carried out our thanks are due to Mr. Howell, who, like a magician, produces with marvellous rapidity, one after another, designs for drainage and water supply schemes for the whole province and who is, at the same time, remarkable for his soundness. I wish I could share the President's optimism that the sewage scheme of Lahore is the forerunner of a host of such installations in the other growing towns of the Punjab. But I regret I am unable to do so, for I know the difficulties which have to be faced. In Lahore the execution of the scheme has been made possible by the imposition of a house-tax which local bodies are generally loath to levy. Besides, so far as financial aid by Government is concerned, they have to consider how best their resources, which are not unlimited, can be utilised and how they should be distributed between urban and rural requirements. I still hope that municipal committees, taking a leaf out of the book of Lahore, will do whatever they can to improve the sanitation of their towns and will not be oblivious of the responsibilities which have been entrusted to their care.

Lahore has also set a model recently in town planning. Restrictions which have had to be imposed to prevent the haphazard growth of buildings must naturally be irksome, but every rightminded person will realise that they are necessary in the interests of the community as a whole and that individual interests cannot in justice be allowed to prevail. Outside Lahore there are few towns in which there has been any activity in this direction. But signs are appearing that the desirability of proper building and town planning schemes is being realised. The harm that has already been done by neglecting the essential principles cannot be undone, and I am human enough not to wish for an earthquake, an air raid or similar calamity which would bring down the existing houses and give a chance of re-erection on hygienic and aesthetic lines. Future development can, however, be controlled. This is a matter in which the co-operation of the town-planner, the architect and the engineer will be needed.

India is essentially an agricultural country and the Punjab markedly so on account of its colonies—thanks to the irrigation system. But in the modern age no country can afford to remain purely agricultural. In fact the progress of a nation has come to be synonymous with its industrial development; and industrial development is to a very large extent dependent on cheap supply of electricity. The Mandi Hydro-Electric Scheme, which is now in its eighth year of operation, supplies a huge industrial load at rates which are lower than those of any other electricity supply authority in the province.

But the scheme has proved very costly and, in order to derive full benefit from the plant installed at Joginder Nagar and the quantity of water available at periods other than the cold weather, Government are contemplating the installation of a steam plant at Lahore. It is expected that the net return will then be more than 2 per cent. after meeting interest, depreciation and working expenses. It is for the electrical engineers to put their heads together and to consider the possibility of resorting to cheaper undertakings which will make electric energy available in sufficient quantities at a moderate rate. Apart from industrialisation, cheap electricity will render the sinking of tube-wells a practical and economic proposition, thereby supplementing canal water and augmenting the irrigated area. In some other countries electricity is used for ordinary domestic requirements, such as cooking, sewing, washing and cleaning. But it must be admitted even by the biggest optimist that that day is yet far off for the Punjab.

In his Address, the President has contented himself by making only a passing reference to engineering education. I shall also content myself by referring to the arrangements now made for the education of civil engineers in the Punjab College of Engineering and by expressing the hope that the products of this college will prove as efficient as those of other colleges on whom we relied as a source of supply in the past and that they will carry on the high traditions which you and your predecessors have established in the Province.

I have now great pleasure in declaring the Congress open and I leave you to your deliberations which will no doubt add to scientific knowledge but from which, I trust, schemes of practical benefit will also emerge.