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CONTENTS

	Page
Address of *Mr. J. D. H. Bedford, I.S.E., President* ..	*i*
Speech *by His Excellency Sir Herbert William Emerson, K.C.S.I. C.I.E., O.B.E., I.C.S., Governor of the Punjab*	*vii*
Speech *by Mr. F. L. Brayne, M.C., Commissioner, Rural Reconstruction*	*xi*
Waterlogging on the Upper Chenab Canal, its causes and cure, *by Rai Bahadur Bawa Natha Singh, I.S.E., Paper No.* 197 ..	1
Discussion on above	34*a*
Agricultural Economics with special reference to irrigation problems in the Punjab, *by W. Roberts, C.I.E., Paper No.* 198	35
Discussion on above	40*a*
The Raising of Jhelum Bridge, *by T. McIntyre, Executive Engineer, Bridges, N.W.R., Paper No.* 199	41
Discussion on above	45*a*
The Roads to Kulu, *by J. Halcro Johnston, B. Sc. (Eng.) A. M. Inst. C.E., A.M.I. Struct. E., Executive Engineer—Paper No.* 200	47
Discussion on above	67*a*
Turbulent Flow in Channels, *by T. Blench, B.Sc., (Hons.), A.M.I.C.E., I.S.E., Assistant Executive Engineer—Paper No.* 201	69
Discussion on above	78*a*
A Note on the Building of Two Reinforced Concrete Box Culverts on N.W.R., *by S.L. Kumar, Assistant Bridge Engineer—Paper No.* 202	79
Discussion on above	89*a*

Page

Some Notes on Gunite and its uses on certain Works on the North Western Railway, *by S. L. Kumar, Assistant Bridge Engineer—Paper No.* 203 91

Discussion on above 105*a*

The Deg Diversion & the Combined Head fall & Aqueduct, *by B.K. Kapur, B.A., I.S.E., Executive Engineer—Paper No.* 204 107

Discussion on above 142*a*

A Regulation Gauge for Headless Canal Meters, *by A. N. Wilson, B.Sc., A.M.I.C.E., I.S.E., Executive Engineer,—Paper No.* 205 143

Discussion on above 151*a*

Quetta Reconstruction Progress, 1935-36, *by Captain N. Boddington, R.E.,—Paper No.* 206 153

Discussion on above 177*a*

Experiments of Premix Work in Mile 35, G.T. Road— *by Murari Lal, B.Sc., A.M.I.E., Assistant Engineer—Paper No.* 207 179

Discussion on above 188*a*

ADDRESS

OF

MR. J. D. H. BEDFORD, I. S. E.

PRESIDENT.

Your Excellency, Distinguished Visitors and Members of the Congress,

I voice the sentiments of every member of the Congress when I assure your Excellency how much we appreciate the practical interest which you have shown in our organization and the honour you have done us by accepting the invitation to open the Punjab Engineering Congress for the second time in spite of your Excellency's multifarious engagements.

On behalf of the Council of the Punjab Engineering Congress, it is my pleasant privilege to accord a hearty welcome to your Excellency and our distinguished visitors. Your recognition of our efforts in the service of this fine Province which is implied by your presence here to-day will always be a source of inspiration to us.

I have also to thank the members of the Congress for reposing their confidence in me in electing me to guide their deliberations and to be their spokesman on this annual function.

Material progress and increase in wealth during the last half century has been phenomenal. Machinery for the manufacture of all kinds of goods both for the service and the destruction of man has been perfected to an astonishing degree. Civilized man is destined to live and work in an environment effected to an increasing extent by science and technology. One of the most important problems facing man is to utilize existing knowledge and wealth for the good of the people of the world and not for purpose of destruction.

Several attempts have in the past been made to define an Engineer. At one end of the scale is the Artisan with little technical knowledge, but with the practical experience to know what can be done with a given material. At the other end is the Scientist and Mathematician, who studies the mysterious forces of Nature. Between the two extremes stands the Engineer. His function is to imbue the dry knowledge of the Scientitst and Mathematician with imagination and apply it to practical and economic planning for the benefit of humanity. He is in fact the link btween abstract knowledge and the hard facts of life, between man and his needs.

In the discharge of his normal duties, the engineer is in daily contact with man and his requirements. As a result, his judgement in human affairs is more developed, more balanced, and more adaptable than that of his collegaue in pure science. He should, therefore, not allow his own judgement and common-sense to be overruled by the opinion of the pure scientist. As an engineer rises to higher positions his most important asset is a strong common-sense and mature judgement. It is very important that this judgement should be his own. The pursuit of truth makes it essential to discard doubtful theories that do not fit in with facts. With common-sense and experience as sure weapons the engineer should not hesitate to overthrow impracticable schemes that will inevitably confront him. At the same time he must be prepared to bring readily into the service of humanity all that the man of science discovers for him. The extent to which the engineer discharges this difficult and dual rôle will always be the measure of his usefulness to the Province and the Government he serves.

Municipalities, States and Provincial Governments are constantly carrying on a variety of technical operations and are concerned to an increasing extent with the regulation of engineering enterprises in the Public Works as well as in Industries. To each nation in this world, the activities of engineers and the uses to which they are put, are matters of supreme importance. The influence of the engineer, whether in peace or in war, whether for good or for evil, has come to stay. But this increase in his field of usefulness will impose still greater responsibilities upon him and he should early realize that to meet them, he must make every effort to fit himself for the burdens laid upon him.

The present has many complicated problems for the engineer to solve. Human knowledge is still meagre to-day though a little more advanced than it was 75 years ago, when the U. S. Commissioner of the Patent Office handed over his resignation to the President because he felt that everything worth while had been invented. The growth of material wealth does not keep pace everywhere with the increase in population. It is for the engineer to come to the rescue by creating new industries, new forms of employment and new careers.

As Government Engineers in the Punjab, in the course of our duties, we have many opportunities to increase the sum-total of social well-being. We should keep a watchful eye that our activities or lack of them do not result in unhappiness or avoidable suffering. This is of particular importance to the irrigation engineer inasmuch as he has close dealings with the great bulk of farmers living on canal lands. Each one of us can give a helping hand in rural uplift of the Province by furtherance of schemes for improving conditions of living. In order to get the best value for the time and money, a maximum co-ordination is

required between the various branches of engineering. There is a tendency for Government engineers to work in water-tight compartments. Cases occur of engineers sitting in rooms of the same building carrying on correspondence with each other when the matter under discussion could be settled in a few minutes' conversation. It has to be admitted that in the past full benefit has not been taken of the knowledge and experience in other branches of the same department. There is much scope for closer collaboration not only between departments, but between individuals of the same department. The Congress provides opportunities for this collaboration and co-ordination. But I feel that sufficient advantage is not taken of these opportunities. Each member of the Congress should consider it his duty to attend all the sessions of this body even if it means some personal inconvenience. The keen personal interest of each individual member in the proceedings of the Congress is necessary if the Province and the members are to derive the maximum benefit from this organization.

We are on the threshold of big constitutional changes in the form of Government, and every year it is becoming more important that an engineer should be able to state his facts, reasons and conclusions in such a way that a non-technical man who is to provide the funds for him, can follow them clearly. His arguments should be as convincing to the layman as they are sound from technical considerations. This ability to argue and convince is best attained by public discussions, and I hope that the young engineers particularly will take full advantage of the facilities afforded by the Congress-platform, at the same time remembering that the time at our disposal is short.

Now a word to young unemployed engineers. Owing to the world depression of the past few years many young engineers have not found scope for their abilities, but there are indications that more prosperous times are at hand, and it is hoped that young men will get increasing opportunities of service. May good luck go with them.

The engineering profession of this Province has to its credit a wonderful record of accomplishment. It is incumbent on every one of us to maintain this reputation which our predecessors in the past earned. Here again the Congress fulfils an important function. It creates a general professional code for the engineer. The present conditions of school and University training are lacking in one essential in that it does not educate the students to a perception of what is done and not done. Students coming from the Universities with excellent intellectual training lack that real perspective of life which should serve them as a sheet-anchor in times of doubt and distress. The result is that when some of them meet a strong current of self-interest they are unable to act in a manner worthy of their profession. The remedy lies in the hands of those who control the educational institutions of the Province.

During the past year, the Buildings and Roads branch have under construction the new Government offices and Council Chamber on the Mall. The position of this building has been happily chosen. It will form a landmark in the history of development of the Punjab. The B. & R. engineers are also to be congratulated on the excellent condition of the Punjab roads.

In the Irrigation Branch we are carrying out considerable repairs to the Upper Chenab Canal headworks to ensure its safety against the fury of the river during floods, but our main occupation has been along four different lines :—

(1) Anti-waterlogging and salt efflorescence measures.
(2) The preparation of the Haveli and Thal Projects.
(3) Economy campaign.
(4) Study of silt problems.

The waterlogging problem in the Punjab is not new. It has been with us since the commencement of canals. We know that we can keep the sub-soil water below the surface and in most areas do away with waterlogging by surface drains. We realize that a moderately high sub-soil water-table that does not contain harmful salts is of itself good, but we are being faced with a very disturbing problem in connection with this rise in the sub-soil water. In our newer colonies the sub-soil water contains large quantities of harmful salts and as the level of this water rises these salts are drawn to the surface and threaten the destruction of large areas of good culturable land. The matter is receiving the most earnest attention of the Irrigation Branch.

The Government of India convened a Committee of representatives from the various Provinces interested in the waters of the Indus and its tributaries and this Committee has been able to draw up recommendations which it is hoped will be acceptable to all parties. The Haveli Project was made to realize the share in the Chenab water which has been allotted to the Punjab. It is a productive project and has been sent to the Government of India and we are expecting its sanction in the near future.

The Thal Project has been made to utilize the share of the Indus water, allotted to the Punjab. The Project has been prepared and is at present under consideration of the Punjab Government. The preliminary financial forecast is encouraging. The Thal Project deals with the only remaining large tract of country in the Punjab that is lying barren for want of irrigation. The scheme is also interesting as providing for a barrage across the Indus. An Indus barrage has not so far been attempted by the Punjab.

A special officer was appointed to examine the revenue expenditure on canals and to suggest means of economy that will not be reflected in

a decreased state of efficiency. He has tackled this problem with skill and has suggested economies totalling 10 lacs a year. His suggestions are at present being carefully considered.

The Irrigation Research Institute has been of considerable help in the study of silt and hydraulic problems. The model experiments that are now a normal feature of the Institute are of undoubted value in elucidation of such problems.

The Mandi Hydro-Electric Installation is developing favourably. The connected load on the system increased from 18,000 K. W. to 23,769 K. W. and the total number of consumers from 9,600 to 11,596 during the year under review. The supply of cheap power has naturally created a demand for tube-well irrigation and its possibilities are now being studied in the Irrigation Branch.

The N. W. Railway buildings suffered heavily in the Quetta Earthquake. The estimated cost of constructing new earthquake-proof buildings is about one crore of rupees. The work is now in progress.

The Delhi station yard has been remodelled to get greater efficiency of working.

The bed of the River Jhelum near Jhelum has been rising steadily for years and it became necessary to raise the Railway Bridge girders. The work has been described in one of the papers to be read at this meeting.

The Frontier Province has recently completed the Paharpur Perennial Canal Project, costing 21 lacs of rupees. This will appreciably increase the irrigation of that Province.

Before I conclude, on behalf of the Congress, I desire to offer our congratulations to the following engineers on the Honours they have received during the year:—

C. S. I.

Mr. F. Anderson, C.I.E., Chief Engineer, Irrigation Branch, United Provinces.

Mr. T. B. Tate, Chief Engineer, Irrigation Branch, Punjab.

Rai Bahadur.

R. S. Lala Daya Krishna Khanna, Executive Engineer, I. B., Punjab.

Khan Bahadur.

Mr. Mohd. Niaz, Assistant Engineer, I. B. Punjab.

Rai Sahib.

Mr. Mehr Chand, Offg. Executive Engineer, P.W.D., B. & R. Branch, Punjab.

On behalf of the Congress I would like to record my deep sympathy for the relatives of the following officers who died during the year.

R. S. Lala Chiman Lal Puri, I. B

R. S. Lala Mehr Chand, B. & R. Branch.

I will now ask your Excellency to be pleased to declare the Congress open.

SPEECH MADE

BY

HIS EXCELLENCY SIR HERBERT EMERSON, GOVERNOR OF THE PUNJAB, WHILE OPENING THE PUNJAB ENGINEERING CONGRESS, 1937 SESSION, ON THURSDAY, THE 18TH FEBRUARY, 1937.

Addressing the students of the Agricultural College at Lyallpur a few weeks ago, I gave them figures regarding the growth of population in the Punjab. I may repeat them here. Between 1921 and 1931 the population of the British districts of the Punjab increased by roughly 3½ millions. Since 1931, the annual returns of births and deaths indicate that population is increasing at a still greater rate. It is estimated that up to the end of 1935 there had been an increase of more than two millions since the last census; and in 1935 alone the increase was little less than half a million. That year was a very healthy one, but, even allowing for that fact, we have to contemplate a normal annual addition of about 400,000 persons to the population of the province. The conclusion I drew from these figures, and indeed the only possible one, is that the outstanding problem of the Punjab is how to increase production so as to outstrip the growth of consumption. I propose to pursue this theme to-day with reference to the part that the engineers can play towards its solution, but, before turning to the future, I may be allowed to say a few words regarding the past. In 1881, the population of the Punjab was 17 millions; in 1931, it was 23½ millions and it is now about 26 millions. In assigning the credit or liability for this I am reminded of a story told of one of the former Viceroys of India. Shortly before his final departure from India, a farewell address was presented to him enumerating the many achievements for which his Government had been responsible, and the list was a memorable one. In conclusion the address read as follows: " It is entirely due to the personal efforts of Your Excellency that the population of India has increased by 33 millions during Your Excellency's term of office." I feel that a similar tribute can be paid to the engineers of the Punjab. It is largely due to them that in less than 60 years the population has increased by more than 50 per cent. It is perhaps because of the realization of this fact that some of them are, I suspect, sometimes a little contemptuous of what they regard as the puny attempts of the advocates of rural uplift. When by a single system of canals they can add several millions of acres to the cultivated area of the province, it is natural that in their pride they should feel that they are by right of achievement the uplifters-in-chief. I am in sympathy with this point of view, but, in so far as there is any misunderstanding in the matter, it arises from a narrow and false conception of what is included in the field of rural improvement. Personally, I have always regarded it as embracing the whole of the beneficent activities of Government—schools, hospitals, agricultural development, veterinary relief, cattle breeding, wide activities of the co-operative movement, industries, scientific research, canals, roads, railways and electrical expansion. These are the big lines of

advance, and it is only when we include them that we obtain a true picture of what development has meant in the past and what its possibilities are in the future. But let us at the same time realize that the scheme will not be complete until a mass of detail is filled in—that many builders go to its making and that its objects are to increase the material contentment and to raise the moral and social welfare of those for whom it is made. This is what rural improvement means, and, because of the continuous increase in the pressure on the soil, we cannot afford to neglect any measure towards its promotion however small it may seem to be. The Agricultural Officer, the scientist, the Revenue staff, the Veterinary Department, co-operative workers and a host of others, official and non-official, are partners with the engineers in this task. The necessity is the greater because we do not possess the comparatively easy means of salvation which were open to us half a century ago when the rivers were unharnessed and enormous tracts of barren waste were undeveloped It may be that science will make the task easier than we can assume to-day, and Mr. Bedford has reminded us that 75 years ago the United States Commissioner of the Paten. Office handed over his resignation to the President of the United States of America because he felt that everything worthwhile had been invented. Science has a way of solving problems as they arise, and even as things are to-day, there is no room for despair. Let us, for instance, consider some of the lines of development which are in sight.

On the irrigation side there is a good prospect of the Haveli Project being taken in hand, and connected with this there are two schemes of feeder channels which will improve conditions in the Nili Bar. Then there is the Thal scheme, which is still to be examined and tested, but which appears promising. These would bring water, and with it new production, to fresh areas. To meet the menace of waterlogging a comprehensive scheme of drainage is being carried out. There are other problems relating to irrigation which have still to be solved. Comparatively little has been done towards the more economic use of water. We have yet to find a practical solution of the loss to canals owing to seepage. There are some interesting questions relating to silt. In these and other problems the scientist is playing a large part, and I would here like to mention the excellent work being done by the Irrigation Research Institute under Dr. Mackenzie Taylor. Sir John Russel recently visited the Institute, and was greatly impressed by the work that is being done there. He told me that it is as good in its own line as any that is being done in any part of the world. Again, to take the question of tube-well irrigation. The great advance made under the inspiration of Sir William Stampe in the United Provinces is a challenge to our own engineers. It may be that both natural and economic conditions will prove to be less favourable in the Punjab and it is premature to assume that irrigation from tube-wells on a wide scale will prove a business proposition in this province, but the time has clearly come when its possibilities must be thoroughly explored, and I am glad to say that Government have quite recently decided to place an officer on special

duty for this purpose. The enquiry will, in the first place, cover seven different areas in the Punjab, and will embrace every aspect of the subject, including the allied question of supplementing canals by pumping into them water from the sub-soil, thus helping to relieve the water-logging problem. What the results of the enquiry will be, it is impossible to say, for the existing data is too scanty on which to form any opinion, but we have now reached the definite position where tube-well irrigation is recognized as a possible means of increasing production on a big scale, and where it will not be rejected unless and until it is shown to be impracticable because of financial, economic, technical or other reasons. In the meantime, I am delighted to hear that members of the Congress are going to see for themselves what is being done in the United Provinces. Closely connected with this question is the future of electricity in the province. Mr. Thomas, who is an enthusiast on the subject, believes that as a means of development electricity will be little, if any, inferior to irrigation, and this may prove to be true if it is possible to provide power at rates which the agriculturist can afford to pay. So far we have been greatly handicapped by the capital cost of the Mandi scheme and the fact that the whole of the interest and present overhead charges have to be borne by the initial stage of development. But there are already schemes afoot to extend Mandi power into new areas, and, apart from these, it may well be that self-contained projects will be practicable for some areas which will permit agricultural and industrial development to proceed side by side. In so far as power will be used for irrigation, a recent decision of Government has defined the respective functions of the Electricity and Irrigation Branches. The task of the former will be to supply power at fixed points. The work of the Irrigation Department will then begin, and it does not require much imagination to see that this may add enormously both to the opportunities and responsibilities of that Department.

We must not overlook the roads and railways. In comparison with some other provinces, the Punjab is admirably served by both, but this does not mean that there is not immense scope for improvement. Whatever be the merits of the road and rail controversy, the fact has clearly emerged that a concerted policy is not only desirable but is feasible provided that a reasonable attitude is shown by all concerned. Among the problems relating to roads a great deal has been done during recent years to reduce the cost of maintenance of metalled roads by increasing their life, but Mr. Macfarlane will, I think, agree that the last word has not been said even on this subject. So far as unmetalled roads are concerned, the scientist is co-operating with the engineer in a joint endeavour to bring their continuous maintenance in good condition within the bounds of practical finance. If a solution can be found, it will be of enormous value to the development of the province, for, as I observed in another connection a day or two ago, the cultivator, who knows his own needs, has no doubt about the importance of good communications.

I have indicated a few only of the many ways in which the engineers can help towards a solution of our greatest problem. You, gentlemen, could suggest many others, and, if you are not always agreed regarding means and methods, this is a healthy sign that your work is alive, and that there is abroad among you the spirit of progress which has achieved so much for the Punjab and will achieve still more. Your annual Congress is an occasion on which old ideas are tested and new ideas are explored. It is an incentive to original thought without which the world would have advanced little.

The Punjab Government have lost or are losing four of their Chief Engineers within a year. Mr. Waller had to retire owing to ill-health and I am glad to hear that he is now better. Mr. Tate, Mr. Macfarlane and R. B. Natha Singh are soon to retire. In a few months Mr. Sullivan who has done so much to beautify the province, will also be leaving us. The province will feel their loss very much. All have done work of lasting value, and I am glad to have this opportunity of expressing the thanks and appreciation of Government.

I will now leave you to your deliberations in the knowledge that out of much talking practical schemes will in due course emerge.

SPEECH DELIVERED

BY

Mr. F. L. BRAYNE. M.C., I.C.S. COMMISSIONER, RURAL RECONSTRUCTION, PUNJAB, LAHORE.

The Government is engaged in the strenuous campaign of rural reconstruction and a very great deal of good work is going on. It is, however, terribly impermanent and begins to fade away as soon as our backs are turned. In spite of the benefits of all kinds which it brings to the people, they do it to please us and not to please themselves.

A lot of thought has been devoted to the question of how to secure permanence and spontaneity and some of the principal remedies are undoubtedly—

(1) Village organization. Unless there is some organization in the village to keep everybody up to the mark and to carry out work or get work carried out, even those who do wish to raise their standard of living are helpless to do so, as most of the work is such as requires the joint effort of many people to carry out.

(2) Secondly, the women must be interested in the movement. This means education, women's institutes and all manner of social work among women and girls. There is nothing like enough social service work being done in the Punjab. There is any amount to do starting and helping with women's institutes, Guides and Blue-Birds, visiting girls' schools, house to house visiting, teaching knitting, sewing, etc., and generally taking an interest in the welfare of the women and children whether of employees, dependents or neighbours.

EXAMPLES.

We badly need a wonderful example of the Royal family out here to keep us up to the mark. The third way by which permanence and spontaneity can be established is what I want to talk a bit about now and that is example. People will not act on lectures, but, if they see living examples, they will copy them.

Example is of two kinds: first, the personal example of everybody employed temporarily or permanently, skilled, or unskilled, looking after their own health in such matters as vaccination, revaccination, quinine, mosquito nets, and so on, and the sight of Government taking a real live interest in the health of everyone concerned with it.

The second kind of example is the homes and quarters and residences of everyone connected with Government. If down to the gangmen's huts and sweepers' quarters they are all clean, bright and nice and

conform to all the suggestions of the better village movement—it is in reality a better homes movement—it must have a vast effect on the general public.

We are preaching light and air, chimneys for all 'chulas,' hay-boxes instead of cow-dung cakes to keep things hot, pictures inside and flowers outside, pits instead of heaps of rubbish, some kind of latrine both for decency and for health, drains running to flower or vegetable patches, or trees instead of stagnating pools.

What an effect it would have upon the public if simple latrines were provided for the innumerable people visiting Government rest houses or offices and they were compelled to use them while waiting about for their business instead of fouling the area all round.

HEALTH

As you have seen, my suggestions hardly affect the structure of your buildings. They mainly concern the plumbing department and in the way the residents live, so that the improvement is more a matter of will and of effort than of expense.

Much of what I have said concerns health and Col. Nicol, Director of Public Health, is in full agreement with me and is very sorry that he could not be here to-day. Both he and all his district staff are at all times ready to help by periodical visits or advice or in whatever other way they can.

I do not wish to suggest that nothing has been done in all these directions. I know full well that a great deal has been done even during and in spite of the financial stringency and I am most grateful for the way in which any suggestions I make are taken up. I only want to spread and intensify the good work so that the Government can never be accused of not practising what it preaches and may set a really good example both in the spirit of service and in its anxiety for the welfare of all that come in touch with it and in making its buildings and quarters living examples of the better homes movement.

Government and public alike will be extremely grateful for any help or suggestions which Engineers can give in designing and popularizing domestic improvements and amenities, labour-saving devices for the house or kitchen or anything that will help to brighten the home and make life more healthy or more comfortable particularly for the poorer classes of the people.