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J. B. SMITH, C.I.E.,
President, 1931-32.

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ADDRESS

OF

MR. J. B. SMITH, C. I. E.,

PRESIDENT.

My first duty this morning, and it is a very pleasant one, is to welcome on your behalf the Hon' ble Captain Malik Sardar Sikandar Hayat Khan, and other members of the Punjab Government, who, by their presence here, not only honour, but encourage us in our pooling of knowledge for the benefit of the Province and the advancement of applied science which is the object of these annual gatherings.

When I asked the Hon'ble Member if he would honour us by taking the chair and opening this our twentieth session, he remarked that, while deeply appreciating the invitation, he felt that as a mere layman he could add or say nothing which would be of use to us or help us. I forget what I said in reply to induce him to come amongst us. But I now take this opportunity to state that one of the reasons for which this body exists is to minister to the needs of layman such as the Hon'ble Member himself and the public of this Province by developing it to the limit of its almost inexhaustible resources.

Laymen have supplied many helpful suggestions to engineers in the past. His Excellency gave us some advice last year, which is being borne in mind and will doubtless bear fruit in season. And was it not a layman. Sir James Wilson, who first conceived the great idea of leading the surplus waters of the Jhelum across the Chenab and Ravi rivers, for the benefit of Lower Bari Doab area ? While we do not ask the Hon'ble Member to give one better than that we feel sure that he will give us some thoughts to stimulate and encourage us in our future service to the Punjabi.

We extend our hearty welcome to many others. Sir Bernard Darley, who has come from United Provincs, and Mr. Gammell. We also extend our welcome to Mr. Teasdale who supplied cement throughout the construction period of our Sutlej Valley Project. We also extend our welcome to Mr. Roberts of Khanewal. We have a new member Mr. Stokes. Our welcome also be considered extended to those whom our eyes have not been able to catch and we hope we will be able to keep them as members of the Congress. There are many others whom I have omitted to see, all these we are pleased to welcome this morning.

This Congress, I am proud to say, gathers strength from year to year. While its members increase steadily but surely, they now stand at 422, the quality of the professional contribution is well maintained.

Also there are always workers willing to contribute their knowledge or skill or industry in one way or another. I am beholden to my Council for their many attendances, at some inconvenience to themselves, and for much helpful advice. The Honorary Secretary, Mr. Fletcher, left us in October for leave on urgent private affairs. His place was sportingly filled by Mr. Gunn, already known to you as a very capable Honorary Secretary. As President of this session I owe him more than I can adequately acknowledge. To our Vice-President and Honorary Treasurer, Mr. Nanda and our Honorary Business Manager, Mr. Howell, I express my warmest thanks.

As is to be expected there have been a few resignations, 3 in number due to retirements. Though Mr. Robertson has not actually resigned he has, I fear, left us for good. A former President very pertinently remarked of him "most efficient of Honorary Secretaries". His very name spelt efficiency and he is a big loss both to the Province and this Congress. Also it is with much regret that I have to record the loss of three members by death since we met last. Mr. J. P. Cook and Bawa Budh Singh of the Indian Service of Engineers and Mr G. T. Hutton of Worthington Simpsons. One more personal touch only. During the course of the year we received a communication from Col. Craster, who did so much for the North Western Railway and for this Congress and who still continues to take a lively interest in our proceedings.

It has been the custom in years past for each succeeding President to give a review of the developments that have taken place in the Punjab from time to time. A former President once humourously remarked that this could equally well be done by issuing Addenda and Corrigenda to the Government Blue Books and referring you to them. But as there are few of us who read more Blue Books than we are compelled to and still fewer who trouble about Addenda and Corrigenda I will notice, very briefly, just a few outstanding achievements.

On the North Western Railway two large bridges have been opened in the past year, one over the Indus at Kalabagh, the other over the Jhelum at Khushab, both of which form subjects of papers at this Congress. Outside the Punjab-proper 100 miles of broad-gauge railways have been opened in Bahawalpur State for the Sutlej Valley Project and 120 miles have been constructed in Sind for areas coming under the Sukkur Barrage Scheme.

In the Hydro-Electric Branch the past year has been chiefly notable for the erection and completion of the penstock pipe-line, the two weirs across Uhl and Lambadag and the whole of the headworks and the connected hydraulic works in the Brot Valley, and the construction of the power station buildings. The main tunnel heading 2 miles long which penetrates the range is expected to meet within the next week.

In the plains some 400 miles of 132,000 and 66,000 volts transmission line has been erected. The former is the highest voltage so far used in

India. The towers and type of construction generally is about the most up-to-date that has ever yet been erected and has been the subject of very appreciative comment by at least two transmission line engineers of world-wide experience during the last few months. During the last three months the local Government have decided to carry out the local distribution themselves. Since that decision contracts have been placed for the erection of mains in 15 towns and the work is proceeding at high pressure and every endeavour is being made to complete it so as to be ready to receive the hydro-electric power when it becomes available in the plains next February.

In the Irrigation Branch the outstanding event of the year has been the completion of the Panjnad Barrage and the successful initial turning of the combined Chenab and Sutlej rivers through it. This barrage is a most important work not only because of its magnitude but because it is the last major work in the final stage of the construction of the Sutlej Valley Project. It is also of strategic value to the Province as it permits further important developments. There are of course anxious days ahead for so far it is only the relatively small winter volumes of the river that have been diverted to their new course and spring and summer conditions have yet to be overcome. But by taking every precaution we hope that the difficulties ahead will be surmounted as those in the past have been.

Another recent development has been the establishment of a Research Section. Irrigation Research was first advocated in this Congress 17 years ago. About the same time the Punjab Government asked the Government of India for a trained Soil Physicist to collaborate with the Irrigation Branch. Nothing happened because of the War. Since then, however, the need for research has become more and more marked and the rapid extension of water-logging has focused attention on the fact that our knowledge of the movements of subsoil water and its physical reactions on the soil itself is extremely limited. His Excellency's Government in all its Departments have taken the broad view, and we now have our trained Soil Physicist with a nucleus for further expansion. Let us hope that expansion is not too long delayed.

The newly constituted Central Board of Irrigation marks another definite advance. It is designed to co-ordinate research in all the Provinces of India. All Irrigation Chief Engineers are its members. They meet once annually to consider and discuss problems confronting irrigation engineers throughout India and Burma. Allied to it is a Bureau of information. Its function is the collection and classification of information on irrigation and cognate subjects from all over the world, and to put enquirers into touch with problems similar to those in other parts of the world, so far as published literature on the subject will allow. Any member of the Service can make use of it.

And now as regards the future. The thought that I wish to leave with you to-day is that though much has been accomplished there is still much to be done. It is but natural that I should think in terms of irrigation for that has been the interest of my official life. But there is another very special reason for my doing so. Irrigation is, as it were, the life blood of the Punjab. Without it the Province, as we know it to-day, would simply not exist. It is well to stress this point as there are those, both within and without the Government, who are apt to forget this fact. After all, it is history.

Though I may think in terms of irrigation, when I say there is still much to be done I allude to development in its broad aspect. New development, whether in the Punjab or elsewhere in the world, requires population, a civilization of some kind. In fact it is civilization that facilitates if it does not actually compel, development. Consider our latest development—the Mandi Hydro-Electric Scheme. Would that scheme have been possible if the tracts, which it is destined to revolutionize, were populated by a backward race. So until such time as humanity can live and thrive on tabloids, civilization to exist and advavance must have a plentiful food supply. So, in the rainless Punjab, at any rate, as in the valley of the Nile (the historic parallel is significant) if developments are to extend irrigated tracts must develop first. We are, however, passing through a difficult period. Conditions are such that economy on all sides is imperative at a time when we should be spending wisely.

Looking through the record of former proceedings for inspiration, I found that in 1926, Sir Malcolm Hailey, that great lover and, servant of the Punjab, said "there is still depression in trade and the stringency that accompanies that depression." I can almost hear everybody in this room say, "Would that it were possible for us to slip quietly back into 1926 when retrenchment was not of our vocabularly and expansion was our watchword." Sir Malcolm then fore shadowed developments in more than one department which, as he expressed it, would give scope to the ingenuity of the engineer. Alas, the indications at present are that far from having scope to advance we may have to mark time for a while, but for a while only I hope.

Unfortunately a considerable school of Jeremiahs has arisen who condemn the engineer and scientist and all their works. They will not believe that a civilization to be worthy of the name, must be built on material progress. They have forgotten that the engineer and the scientist created modern civilization. They have forgotten that this industrial age has heaped upon us myriad comforts and amazing powers. These Jeremiahs cannot see any prospects of development ahead: groping in their blindness for some way out of their present darkness they wish to lead the world into a *cul de sac* of stagnation. But civilization cannot stand still. It must either progress or retrogress and we have only to read of the recent advances, achievements and activities in,

three of the most modern fields o fdevelopment, *viz.* electric power supply and distribution, wireless and aeronautics to recognise that the world means to progress inspite of what is called financial depression. So here, as elsewhere, the engineer and the scientist must continue to light the path to progress and it is for those who love and wish to serve this Province to see that that path is followed and that the local Jeremiahs have the scales of their blindness removed.

This is essential in order that when schemes for development of irrigation. the precursor of further advancements, are ready, they may be viewed in the clear light of reason and in their true perspective.

And, if then perchance, the economic outlook is not as bright as we would wish it to be, let us take consolation from another pronouncement by Sir Malcolm Hailey on the same occasion, which reads :—" It is to the interest of the Province to recognize that in many cases the end gained cannot be measured by the actual returns."

I do not intend to bore you by telling you of the possibilities of such developments and where they lie. You have only to study the map of the Punjab to see for yourself and to know how far reaching will be the effects of expansion.

But I do want to ask you to think continually of future expansion and to work continuously for it.

A few words more, gentleman, and I have finished. They are intended more especially for the younger members of our profession. To progress as I would have you do, three essentials are needed in our professional and corporate life ; courage, work and character. You must have courage and lots of it, for there will be many occasions when you need it. You must believe in your work, believe that it is of great benefit to humanity, and take it from me, that work to that end will win. And you must have character. It is character even more than their work that made heroes in the past, such as Faraday, and, to come nearer home, our own Kennedy, whose memory is prepetuated in the Kennedy Medal. So cultivate character assiduously, cultivate it individually and collectively. You will then possess an asset worth having. And you will be enabled to live up to our motto, *Unity and Progress.*

I now ask the Hon'ble Member to declare our Congress Session open.

ADDRESS

OF

THE HON'BLE KHAN BAHADUR CAPTAIN SARDAR SIKANDAR HAYAT KHAN, M.B.E.,

MEMBER FOR REVENUE.

I deem it a great privilege to have been asked to open this Conference, and I am very grateful to your President for the cordial welcome he has extended to me and my colleagues on your behalf and for his kind reference to me in his address.

The selection of a suitable theme for an address to an audience of experts is a matter of some difficulty for a layman and that difficulty gathers in proportion when the task falls to the lot of a layman like myself, who is fully conscious of his limitations. I confessed as much when Mr. Smith asked me to accept your kind invitation ; but he persisted and in a moment of weakness I gave way.

In view of what I have said, I hope you will excuse me if the few observations which I have to make strike you as of too general a character or perhaps even commonplace. But I trust that you will take them in the spirit in which they are made, and as coming from one who has always looked upon your work with admiration, and held members of your profession in esteem as among the foremost standard-bearers of light and progress.

The importance of your profession, gentlemen, cannot be underrated. It has in the past, during all times, received its well-deserved quota of tribute from the people and will continue to do so in future in spite of the Jeremiahs. Criticism of an individual scheme or piece of work, whether through ignorance or genuine conviction, is nothing new. Eminent scientists and experts have had to contend with it ere now, and have in the end triumphed ; and those among you who aspire to break new ground or initiate new schemes must also be prepared to face it in the same spirit and overcome it in accordance with the best traditions of your great profession. You will, I trust, agree with me, that honest criticism, whether it comes from a layman or an expert, does not thwart, but on the contrary helps the expert to make his scheme perfect. Criticism actuated by dishonest motives need not deter you. It is bound to end in the exposure of the critic ; history is full of such instances. Eliminate those isolated cases of tainted and interested criticism and it would be difficult to find a person who could honestly deny the great part the engineering profession has played in the cause of civilization. The numerous and magnificient examples of engineer's art

and of craftsmanship, the world over, which to this day remain objects of admiration and wonder bear ample testimony to the skill and achievement of your profession. But for these standing monuments of the engineer's skill and vision, the history of olden civilization would have remained, for ever, a closed chapter to us. It is from the architectural relics of the past that the historian has been able to patch up the mosaic-work picture which affords us a glimpse into the history of the great nations and civilizations of the past.

But it is not necessary to delve into ancient history or even to look to other countries to appreciate the value and magnitude of the engineers. Our own province furnishes ample material for the purpose. During the last few decades the energy and skill of the engineer has transformed this land of the five rivers out of all recognition. Take any branch of engineering—civil, mechanical or electrical—and you will find that the skill and energy of our engineers has effected during the brief span of the last 40 or 50 years a transformation which can well be described as phenomenal. The stately buildings in our Capital City ; the gigantic structures of iron and steel that span our big rivers ; the rapid and comfortable means of travel and transport provided by the progressive administration of the North Western Railway ; the net-work of smooth, metalled and tarred roads which traverse the countryside from one end of the Province to the other and which have not only made swift and comfortable travel possible in places where a bare decade ago camel was the only means of conveyance, but have made it possible for the peasant to carry his produce to the nearest market-place with ease ; and the electrification of our cities and towns and the prospects of further rapid expansion in this direction with the advent of the Mandi Scheme, are some of the achievements of our engineers of which any country may be justly proud.

But this is not all. The crowning achievement of our engineers is depicted in the magnificent system of our irrigation canals which have converted large expanses of arid waste into smiling fields and gardens, and have made the Punjab what it is today, the land of plenty and progress. The importance and value of our vast irrigation system—the largest in the world—to the people and the Province can be judged from the fact that in addition to the direct benefit it bestows on the owners and cultivators of the canal-irrigated areas, it contributes to the provincial exchequer almost half of the total income of the Province. Our supremacy, however, has been challenged by our neighbours in Sindh, where one of the largest irrigation works—the Sukkur Barrage Scheme has only recently been inaugurated. While I am not prepared to accept a second place for my Province, I believe I am voicing the feeling of all of us here in offering our congratulatoins to its inceptor, and those responsible for its construction on the successful completion and opening of this great work, which adds yet another achievement to the already creditable record of the engineers and constitutes a further landmark in the history of the material progress of the country under British rule.

While I am on the subject of irrigation, I should like to draw your attention to two distinct but important problems which have to be faced and successfully solved in order to avert a serious loss of revenue to the province, and to conserve for the zamindar his land in areas threatened by waterlogging, and to avoid his income and through him of the State being adversely affected by the impending competition from Sindh. The first of these problems, as you are aware, has been receiving, during the last few years, anxious consideration of Government and its expert. Thanks to the untiring zeal and efforts of Mr. Robertson we are now in more or less complete possession of information regarding areas affected or threatened by waterlogging and the extent to which these and others are likely to be affected in the future. Those of you who are members of the Waterlogging Board or have seen the proceedings of the meetings of that Board are no doubt aware of the elaborate and systematic survey conducted by Mr. Robertson to locate the affected areas and to gauge the effect of the various remedial measures which have been applied to check this menace. While there may be still some pessimists who visualize our flourishing canal-irrigated colonies being converted into boggy *jheels* or unculturable *kallar* waste fifty years hence, I am convinced that the efforts of our experts will not only succeed in bringing under control this growing menace but will in time reclaim the area already affected by waterlogging. My conviction is not based on mere conjecture, but on the results of the experiments, which though only recently initiated, indicate a definite promise of success.

On the reclamation side Dr. McKenzie Taylor is conducting experiments for rehabilitating *kallar* and *thoor* lands at Chakanwali and has also initiated experiments on a small scale on the Lower Jhelum Canal with a view to bring under cultivation again the land which has been abandoned by some of the horse-breeding grantees as unculturable. The results hitherto in both these places are highly encouraging. Financial stringency has unfortunately made it necessary to curtail expenditure all round and consequently we are not in a position at the moment to expand our activities. Nevertheless, it has been decided to carry to completion all important works already initiated in connection with our anti-waterlogging campaign.

The other matter which is equally compelling and needs immediate attention is the impending competition from Sindh which we will have to face in the near future. It is claimed that the Sukkur Barrage Scheme will bring under cultivation $5\frac{1}{2}$ million acres in Sindh and Khairpur. It is not difficult to visualize the result of this enormous accretion to the already large acreage under wheat and cotton in this and the other provinces. The question is how are we to meet or at least to minimse the conceivable effects of this competition from a tract which has a considerable advantage over us due to its closer proximity to the port of Karachi which has hitherto been handling almost exclusively the exportation of Punjab produce. The problem is undoubtedly difficult, but to my mind not incapable of solution if we set about

it in the right spirit in the right way ; and I venture to make a few suggestions which may be of some help to our experts in dealing with it. We should, I think, in the first place, explore the possibility of substituting partially other money crops for cotton and wheat. We should, in the next place; examine whether it is feasible to extend the area under sugarcane, and, if so, to encourage the introduction of improved varieties of cane. Sindh can grow cotton and wheat, but it is outside the cane zone while we are not. Sugarcane, however, requires more water while our supplies are limited. We must, therefore, set about to educate the zemindar to conserve his water and to use it in a manner which would enable him to grow equally good crops with a lesser amount of water. I went over the farm of a progressive zemindar close to Lyallpur the other day and was agreeably surprised to find that he was saving at least 20% of his water by resorting to *kiarabandi* and a further appreciable amount by setting apart fields for *rabi* and *kharif* crops in separate alignments. If every zemindar would only follow his example, something like a quarter of the water which is now being virtually wasted would be available for extra irrigation needed for sugarcane or for extension of irrigation. It is not difficult to compute the enormous saving to the zemindar, in the province if this wastage could be avoided. It would, therefore, be useful to launch an extensive and sustained campign of educative propaganda to bring this fact home to the average cultivator and if despite our efforts he still fails to appreciate the benefits of conservation it would be necessary to devise other means to persuade him to adopt improved methods of irrigation in his own interest as well as in the interest of the province as a whole.

Another factor which has a direct bearing on this problem is the incidence of railway freights on agricultural commodities and their effect on the movement of these commodities to the ports and to other parts of India. I am afraid that unless the existing rates are revised, both the railways and the producer are bound to suffer ; the former on account of loss in traffic and the latter by the accumulation of large stocks in the colony *mandis* which must inevitably result in the stagnation of trade and consequent slump in prices. Let us hope, that the North Western Railway, for their own sake as well for the sake of the people of this Province, will take the initiative in this matter and give a lead to the other railway administrations. I have ventured to make these suggestions with a view to draw the attention of everyone concerned to this important problem, and in the hope that they might stimulate interest of the people and the experts in a matter which so closely affects the people of this Province. What is needed is concerted action on the part of the people and the various Government departments concerned, as it is only by the closest collaboration of them all that we could hope to succeed in averting this impending menace to the prosperity of the people and the State.

Gentlemen, I will not detain you much longer, but before I conclude, I wish to avail myself of this opportunity to express the thanks and

appreciation of the Government for the long and distinguished services rendered to the Province by your President. Mr. Smith's connection with the Irrigation Department commenced in nineties of the last century. Since then his work both in the technical and administrative spheres has been such as to command the respect and admiration of all who came in contact with him whether in their official capacity or as non-officials. By his retirement, Government would lose a trusted adviser, and the Department an esteemed Chief. I have been desired by His Excellency the Governor to convey his personal thanks to Mr. Smith for his assistance and advice as Secretary and Head of the Irrigation Department, and to this I wish to add my own quota of tribute for the help and guidance which I have invariably received from him in the discharge of my duties as Member-in-charge of this important Department, and I shall always retain pleasant memories of my association with him both in my official capacity and as a personal friend. I am sure you would like me to wish him, on behalf of us all, a pleasant voyage home, and many years of health, happiness and prosperity.

I have much pleasure in declaring this Conference open.