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THE INDIAN FAMINE,

AND

WHAT IRRIGATION WILL DO,

AND

WHAT IT WON'T DO FOR INDIA.

BY A RETIRED OFFICER,

Madras Staff Corps.

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To LIEUT.-GENERAL SIR ARTHUR COTTON, K.C.S.I.,

Royal Engineers,

DORKING.

MY DEAR SIR ARTHUR,

I must first of all express a hope and a wish for your complete restoration to your usual good health, and here, with your kind permission, I dedicate these few paragraphs to you, hoping you will approve of the suggestions I have made for the prevention of Famines in India. I feel bound to thank you for all your care and thought for my instruction as an inexperienced young Officer, when in 1846 I was placed by the Government of Fort St. George as an Ensign under your orders to assist in the construction of the Godavery Anicut.

Though I have now retired from India, it was you who first taught me to feel an interest in that country, and I firmly believe now that with a well considered plan of Irrigation Works, similar to those in Tanjore, Godavery, and Kistnah Districts, Famines will cease to have, or hold any, footing in India.

Irrigation in India means abundance of food and with it happiness and contentment for the people.

It also implies progress in cheap traffic and transport of merchandize, and productions of all descriptions on the Rivers and Canals. If these ends are desirable, Irrigation, and nothing but Irrigation can realize them.

Now, what Irrigation can't do is the development of India's mineral and industrial resources—that can only be accomplished by its opposite element. In the following pages, and especially in the last paragraph, I have endeavoured to point out a plan that will assist in attaining that object.

Believe me,

My dear Sir Arthur,

Yours very sincerely,

F. A.

THE INDIAN FAMINE.

The Indian Famine is fully developing its extent, and its cost will be very little less than eight millions of money. The failure of the district rains always means scarcity, and when the periodical rainy seasons, namely, the North East and South West monsoons fail, or are insufficient, Famine in a small or intense degree always follows; I am here speaking of the districts in India which are not under irrigation.

At present the Famine affects twenty-two districts in Western and Southern India; none of these districts, or at least, I believe, only one, is under irrigation, and here, in this district, I have reasons for believing the Famine is not severe, a scarcity from the failure of the local rains on the high lands; but in round numbers there are just now 170,000 square miles of country that are suffering from Famine.

I cannot pretend to number the *starving* population of these twenty-two districts, but I hope presently to submit a plan that will always mitigate, and I believe eventually prevent, the recurrence of Famine.

The construction of Anicuts or Weirs across the Rivers in Southern India has been understood and appreciated for nearly fifty years. I speak now with special reference to the districts of Tanjore, Godavery, and Kistnah; the total number of square miles in

these three districts probably exceeds 20,000 of well irrigated lands, and about 1¾ millions of money are derived yearly in revenue; I believe the yearly revenues from the above three districts bears out this comparison.

The importance of irrigation and drainage requires to be thoroughly understood and appreciated before it will occupy the attention of the district officers in India. Nothing can be better than a trip into the Famine stricken country, to be followed up by an inspection of a well irrigated district; then the contrast becomes indelibly impressed on the mind and memory, and beneficial results must follow.

For many years the most talented Irrigation Engineer Officers have hailed from Madras, and I would recommend the entire system of cultivation which attains in the Tanjore, Godavery, and Kistnah districts, to be studied and carried out in all our Indian districts; taking especially as an example Tanjore, where, with 3,000 square miles of country, the revenue yearly collected is nearly a million of money.

I need only instance one fact to mark the importance of irrigation in such a hot, dry, thirsty land as India. Many years ago the Northern district of Southern India was actually decimated with Famine. The construction of an Anicut across the Godavery river, in 1846, was suggested, planned and carried out. Since then Famine, or even scarcity, have been

unknown, and where I had once shot floriken and quail in dry grassy plains, after the Anicut was constructed, in travelling up the navigable canal, I could not even count the stacks of grain covering the same ground, nor could any one else, for they were too numerous to count, though the boat certainly was not travelling more than three miles an hour. Here is actual proof of the great benefits from irrigation, which at least is the first important point; and next comes internal communication by navigable canals; and last, though not least, is drainage to carry off the surplus water, for even too much of it is not desirable, as it often produces fevers and other malarious diseases.

65981

Some old fashioned and prejudiced people in India and from India scout the idea of irrigation, and declare other sources of revenue are far better; but where irrigation works are properly, *i.e.*, scientifically planned and carried out, 15 to 40 per cent. is obtained in annual returns on the capital invested. Figures from actual revenue can be brought, if required, to prove this assertion.

Now, supposing that these twenty-two districts at present suffering from Famine can be irrigated, or at least brought under the direct supervision of an Engineer officer of proved skill and ability, instead of an outlay of eight millions of money being required to feed the starving population, under favourable circumstances a yearly income of about eight millions

of money might reasonably be expected, after a well-considered plan of public works has been carried out: this estimate is allowing only about 50 per cent. of what is now actually yearly collected from our three well irrigated districts above mentioned in Southern India.

Prevention is better than cure, we are told, and by the timely construction of public works on all our Indian rivers, storing water for irrigation and navigation, would become a source of revenue to Government, food and contentment to the people, and a prevention of Famine for the future.

Any one with any actual experience of cultivation in India knows perfectly well that water, at periodical times, is an absolute necessity to procure a crop or harvest of any kind; and though in India, on the high grounds, it is sometimes difficult to extend irrigation to them, for even in India water won't run up hill, it is much easier to construct works to control the hill streams from their source in such a manner so as to render the water available for irrigation. No doubt, in a very hilly country, the stream assumes the force of a torrent, and is sometimes difficult to manage, and it is now evident that more attention must be paid to what in India is called dry cultivation. In some districts it is often carried on by raising water from wells, but in a very dry season the wells themselves dry up and the crops with them.

The ordinary native way of carrying on irrigation

was from tanks where the rain water was stored, and occasionally these tanks were filled by hill streams and rivers, and even anicuts have been built which plans answered well; but the tanks that were situated above the reach of the rivers were dependent on the local rains, so when they failed in any district, a scarcity was the result, and it is high time that some permanent preventive measures against Famine should be resorted to, not only in the twenty-two districts where the Famine now rages, but generally throughout India.

I am a great advocate, and an interested one, for the general adoption of extensive irrigation and development of the navigating powers of our rivers in India. I have seen the Ganges, Hooghly, and Damoodah and other rivers in Bengal. In Bombay I have seen the Nerbuddah, Heron, Taptee, and four or five smaller streams; while in the Madras Presidency I have seen the Mahnuddy, Weingunga, Wurdah, Godavery, Kistnah, Pennaar, Pallair, Coleroon, and Cauvery, and may claim to have formed some experience after having served nearly ten years in the Engineer Department in the best irrigated districts in the Madras Presidency.

I will here advocate the construction of iron anicuts or weirs in India, and after a very careful study of the subject I believe that the expense of an iron anicut or weir, including every contingency, will not exceed that of a stone masonry one of

similar dimensions, where stone is near the river, or even on both sides of the river bank. This is a bold assumption, but I believe it will be proved to be a fact nevertheless; and I further believe that an iron anicut will answer every purpose that a stone one will, and that iron under sluices will be thoroughly efficient in removing an excess of accumulation of silt or deposit of sand in front of an anicut, and that the efficiency, durability, and celerity of construction, and ultimate economy of iron anicuts, will eventually be proved. Having endeavoured to establish a claim for the importance of irrigation, I will point out that by constructing anicuts, or weirs of iron, either imported from England, or manufactured in India, a great many works of this kind can be constructed at one time, even in one district, instead of being dependent on a supply of stone, which may be a mile or miles away from the river, or the supply of lime might fall short of the demand, or other various contingencies which constantly occur when any great masonry works are in hand.

Again, these hill streams in India cannot begin to be controlled too soon from their source, and with a well-planned series of iron anicuts, constructed like a series of terraces and troughs, etc., the whole, or nearly the whole, of the first rains might be made to flow over the fields, instead of running waste for thirty or forty miles, doing more or less damage to crops.

The last reports about the Famine states that eight millions of money will be spent in alleviating the distress and feeding the starving population, whereas had this sum been expended in public works it would have constructed two hundred anicuts or weirs over rivers or streams in India which would have greatly enhanced the Government Revenue, and would have permanently prevented the recurrence of Famine in those districts.

Very little consideration will show how completely iron public works—that is, large and important bridges and works of all descriptions—have superseded the old-fashioned masonry constructions. The causes for such changes are numerous. I will endeavour to point out some of them. It is because the iron works are more suitable, more quickly constructed, more durable and more economical to build, less time occupied in collecting materials; and lastly, more European science and skill have been wanted to meet the requirements of the works.

There are evident signs of coming improvement, and I will here quote one item: Wheat which is now coming home to England in large quantities (for something like 200,000 tons of wheat have arrived in England from India during 1876), and the Indian wheat seen in the Victoria Docks on 1st February, 1877, was beautiful, and pronounced by a very competent and impartial authority to be equal to any wheat ever imported into London.

The Indian teas, when purchased pure and genuine have been reported on very favourably, and information assumes that in about two years further development of its cultivation and manufacture England will be quite independent of China teas.

India, without English enterprise, skill, and capital, would be a very unproductive country. But care should be taken that India does not realize an unproductive capital of fifty millions in Railway Stock, as we have in England, and even now it is worth considering whether, with very little additional expense in machinery, the quantities of old iron rails lying rusting all over the country might be made hot, and rolled out into fresh bars to the great benefit of the shareholders generally, instead of accumulating additional old rails and purchasing new ones from England at a considerable outlay, as so few railways in India pay a dividend of 5 per cent., though there are two which do pay as much and a little more. Several Indian Railways will no doubt pay 5 per cent. this year, but it will be money expended upon the transport of grain out of the eight millions for the Famine.

Another point in India's progress is the saving that may be effected in utilizing Indian lead for the rifle practice of the Troops in India. Lead now costs in England about £20 a ton, and the lead in the Kurnool and adjoining district lies dormant, but could, with very little trouble and expense be made available and a useful economy established in that mineral.

This lead was analyzed in the Calcutta Mint, and I believe one specimen absolutely showed a proportion of 400 ounces of silver per ton on lead. The Limestone Rocks, in which this lead is found, in Southern India extend, with other series of rocks, 250 miles in length, 100 miles in breadth, and 20,000 feet thick. What else may be valuable in these fields time will show, but an opinion of something good was expressed by Professor McCoy in September, 1850, "It would therefore be quite reasonable to expect most prolific coal beds in limestone with Oolitic fossils"; and certainly in no less than six different and well-known localities we have fossils in these limestones. The term Oolitic may be old-fashioned, but it is explicit. These fossils were originally discovered by members of our India Service, who have done their best to describe these fossils, and pointed out where they can be found now; and some of these, if not the whole of them, are on the English geological horizon of the so-called Oolitic Rocks.

If the natives of India had more practical knowledge of India's capabilities as a producing country there would be larger exports from India, and here it is as well to mention that the exports and imports between France and England has led to their annually reciprocating 15 millions of money. Again, the paid dividends on 30 British Mines in 1876 amounted to £188,000, or about 15½ per cent. on original capital, and a lead mine in Montgomeryshire, established in

1869 with a capital of only £60,000, has since that period sold £500,000 worth of lead ore, and are now realizing a monthly profit of £6,000. Surely by a judicious selection of India's raw materials, with judgment and economy, some important results may be anticipated.

In England we have seen fine specimens of India's raw products of all description, but I don't think that we have as yet learnt, either in England or India, the best mode of manipulating them, to wit the experiments of melting the iron ore at the Worara Colliery! And another attempt within my experience was unsuccesful to melt iron ore in a Government Workshop until taken in hand by a Civil Engineer, under whose skilful manipulation the iron ore ran like water through the workshop. It is strange that Englishmen should have such difficulty in utilizing on a large scale the iron ores of India, whilst the native blacksmiths and iron smelters mould the iron in every conceivable shape for their own use and benefit.

I am no advocate for a palatial building on the Thames Embankment as one of the requirements for India's progress to exhibit the raw material from India. But what is really required is a building in India at each of the three Presidency Towns of a suitable construction for the climate, where all the manufacturing arts can be seen at work, with a lecture room attached for the English and Native Professors, and where the whole of India's raw productions of each Presidency

can be worked up into beautiful, attractive, and saleable forms. This arrangement, I verily believe, would be the first step toward India's material progress, and such an institution would prove to the natives our anxiety for their well-being, and would unite more security the people of India with our own country.

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